The Israeli Economy

A Story of Success and Costs

JOSEPH ZEIRA

THE ISRAELI ECONOMY

The Princeton Economic History of the Western World

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To my wife Anat Zeira and to my daughters,
Noa and Yuli Zeira

With love and gratitude

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PREFACE

This book tells the story of the economy of Israel. It is a small country of only 9 million people, but I strongly believe that its story should be of interest to people from other countries as well. One reason for this interest is that Israel has experienced large shocks during its short history, such as large immigration waves, intense wars, the negotiation and implementation of peace treaties, and more. These shocks hit the small economy strongly and thus enable us to isolate their economic effects and to analyze them. In other words, Israel has been a unique laboratory, with many natural experiments, which enable us to examine economic mechanisms in a fascinating way.

A second reason the Israeli economy should be interesting to non-Israelis is that Israel is located in the heart of the Middle East, an area of great importance to the world. First, it is important geographically, as it connects three major continents, Asia, Africa, and Europe. Second, it is rich with oil, which adds to its significance politically and economically. Third, it is the birthplace of the three major monotheistic religions, of which two, Judaism and Christianity, where born in the country of Israel. As a result of this importance, the country and the region have always attracted foreign conquerors and rulers, like Egypt, Assyria, Babylon, Greece and Rome in ancient times; the Arabs, Crusaders, and Ottomans in the Middle Ages; Britain and France in the twentieth century; and now the United States.

Today, Israel plays an important role in the Middle East. Unlike other countries in the region, its population is largely not indigenous but consists mostly of immigrants and their descendants. Many came from Europe, but many others came from other areas of the region itself: these are the Jews from the Middle East and North Africa. More importantly, the immigration to and colonization of the country gained much support from the big powers, Britain first and the United States later. To this day, many view Israel as alien to the Middle East.[1] Today Israel is a major power in the Middle East, militarily, economically, and politically, so it is impossible to understand the region without understanding Israel and its phenomenal success.

The book has four main parts, which follow a historical background. History is highly important for understanding any economy, because if we wish to apply economic theory to any country, we cannot do so blindly. We need to thoroughly understand the specific circumstances in which the economy develops and operates in order to use economic theory properly to understand it.

Part I of the book analyzes the rapid economic growth of Israel. Within 100 years, Israel grew from a small and poor country on the periphery of the Ottoman Empire to become one of the thirty richest countries in the world. Many observers call it a miracle of economic growth. This part consists of three chapters. Chapter 2 shows that the main period of fast economic growth lasted 50 years, from the early 1920s to the early 1970s, and it was a period of “catching up” with the global frontier. This chapter also shows that this economic growth was unique,

especially relative to the neighboring countries, which are much poorer. Chapter 3 shows that Israeli economic growth was not a miracle and that standard economic theory, together with the unique history of Israel, can fully account for it.

Chapter 4, the last chapter in this part, discusses additional aspects of economic growth in Israel. It analyzes the huge success of the high-tech sector but raises some questions about how much this sector has contributed to aggregate economic growth in the country. The chapter also studies the rate of fertility in Israel, which is very high by international comparisons. The chapter then raises the question of why Israel did not fully catch up with the frontier and why its labor productivity is still significantly below that of the most economically advanced countries in the world. It shows that a large part of this missing productivity is due to missing capital, caused by the risks of the Israeli-Arab conflict.

Part II of the book focuses on the economic effects of the Israeli-Arab conflict. Israel is unique in living in a conflict continuously, even prior to its establishment. Hence, we can learn much about the effect of such a conflict on the economy. In 1948, the Israeli-Palestinian conflict expanded to become a widespread conflict between Israel and the Arab states that surrounded it. It became a conflict between conventional armies, which is very costly. Chapter 5 in this part describes these costs and shows how they led to a severe fiscal crisis and almost to bankruptcy. In 1979, Israel reached a peace agreement with Egypt, which ended de facto the wide conflict between Israel and its neighboring Arab states. The conflict returned to its Israeli-Palestinian stage. The narrow conflict has much lower direct costs, but it has many other indirect costs, as described in chapter 6.

Part III of the book is of high interest to economists, as it uses the unique history of Israel, of powerful external shocks, to test some important economic theories. Chapter 7 describes Israeli business cycles and shows that due to the large shocks that hit Israel, we can identify the shock that began each recession and the shock that ended it. Interestingly, except for one recession, all reflect domestic shocks. Hence, business cycles of Israel did not correspond to global cycles. A second lesson from this chapter is that all business cycles in Israel were demand driven. A third lesson is that returning to the narrow Israeli-Palestinian conflict in the 1980s increased the country's vulnerability to business cycles.

Chapter 8 examines the balance of payments in Israel, which was in a deep deficit in the past and is now balanced. The chapter shows that the trade deficit in Israel was high whenever people expected gaps in income between the future and the present, as in periods of high growth, immigration waves, wars, and temporary transfers from abroad. This finding fits very well the predictions of the intertemporal approach to the balance of payments, the leading theory in the area. Chapter 9 examines the period of high inflation in Israel, between 1973 and 1985, and shows that it fits very well the monetary theory of inflation with rational expectations. Chapter 10 analyzes the long process of disinflation that followed the 1985 stabilization program. It shows that this long process fits well the theory of the Phillips Curve.

Part IV of the book deals with socioeconomic policies and more specifically, with the Israeli experiment in neoliberal economic policies. Chapter 11 examines the degree of public intervention in the economy over the years. It shows that the private sector was always dominant, even in the initial years of the state, when the labor movement led the country. This was a result of the importance of the national goals in times of crisis, which were top goals for the labor movement, which was the leader of the Zionist project. Chapter 12 describes how the government reduced its expenditures drastically after the peace with Egypt and used this

reduction to lower the tax burden. Interestingly, economic growth did not change much during this entire period and has remained quite stable since 1973. This stability of growth is therefore strong empirical evidence against the claim that neoliberal policies encourage economic growth. Chapter 13 examines the high level of inequality in Israel. It shows that the neoliberal policies, especially the reduction of direct taxes and of welfare subsidies, increased inequality significantly.

Forty-two years ago, I switched from the study of mathematics to economics. One of the reasons for this transition was my growing interest in social and political questions. I was hoping that understanding economics could help me answer these questions better. Since then, I have studied, taught, and done research in economics. Gradually I realized that the connection between economic understanding and solving social and political problems is not so simple. On one hand, understanding economics has enabled me to examine critically many political claims and to tell when they are fact based, when they rely on illusions, and when they are based on deception. On the other hand, I have learned that understanding economics does not always provide clear answers to important political questions, as these questions also depend on worldview and on social values, which can differ from one person to another, even if the individuals share the same economic knowledge.

An important and wise economist, Frank Hahn, once said that economics does not solve the major disputes between us, but it helps us understand better our differences. I believe that this is a great truth. The way I understand it is that economics should open options instead of closing them. Namely, there is no such animal as “the right economic policy.” There are many possible economic policies, and economists can study the costs and benefits of each policy to different groups in society. However, the choice among different economic policies is a political decision. Hence, this book is not trying to prescribe what economic policies Israel should follow, as many books in the past have done, but rather to better understand the different options and their implications.

However, this book is not only about economic policies, but mostly about the unique story of the Israeli economy and what can we learn from it. One of the main lessons from this book is how well economic theory can explain many of the developments of the Israeli economy. The book shows that the rapid economic growth in the 1950s and 1960s, the high inflation in the 1970s and 1980s, the current account deficit in the early years and its decline to zero in later years, and much more, fit very well neoclassical economic theories. To do this, the book needs to remind us of these theories. I describe them intuitively in the main text, to make it accessible to nonprofessional readers, while I defer the technical presentations to appendixes at the end of the book.

Naturally, this book contains large amounts of economic data, in tables, graphs, and in the text itself. Data play a major role in the book for many reasons, but perhaps the most important one is that data help us demolish many “accepted truths” and show that they are actually myths. For example, many in Israel believe that our tax burden is high, while the data show otherwise. Many believe that the fiscal crisis of the 1970s and 1980s was a result of wasteful welfare policies, while the data show that the main reason was the intensification of the Israeli-Arab conflict after 1967. The data are therefore the factual basis for the book.

Where do the data come from? Mostly from two sources. One is the Israeli Central Bureau of Statistics, especially the Statistical Abstracts it publishes annually. The other source of data are the Statistical Appendixes of the annual Bank of Israel Reports. Both of these institutions, the

Central Bureau of Statistics and the Bank of Israel, helped me significantly and provided data in addition to their publications. However, most of the data are from the open publications of these two institutes and are fully available on the Internet. As with all such institutions, they revise the data every year. Hence, some of the data in the book may not fully fit future publications of these two institutions. However, such revisions are relatively small and do not affect the overall picture that emerges from them. The book also uses data from other sources, like the research center of the Knesset, the Israeli Parliament, and even publications of the US Congress.

No single book can fully cover all the issues of a broad topic like the Israeli economy, and this book leaves out many such issues as well. It reflects my intention to focus on some important issues and deepen their analysis, rather than covering too many details. Some issues, like the black economy, are missing for lack of satisfactory data. I should also admit that the book reflects my own specialization in macroeconomics, the area that studies general economic phenomena, such as economic growth, business cycles, inflation, balance of payments, and inequality. Therefore, although the book deals extensively with the Israeli economy, it has an emphasis on Israeli macroeconomics. This is not only due to my own expertise, but also because the unique and interesting aspects of the Israeli economy are macroeconomic.

The book gains much from my own research on the Israeli economy. My main work in this area, three papers written jointly with Michel Strawczynski from the Bank of Israel, is on fiscal policy in Israel over time. Another research project that influenced this book is my joint paper with Thomas Sargent on the jump in inflation in Israel in October 1983, described extensively in chapter 9. We published this paper in 2011, which shows how often we understand things quite late. Time lets the dust settle, allows us to think more clearly about the issues, and enables a broader outlook. This is why understanding economics and economic history are so strongly related.

Hence, this book is about the Israeli economy and about the economic history of Israel at the same time. Economics is not just a description of the current situation, but an understanding of processes and economic mechanisms. Such an understanding requires a detailed historical analysis, for three main reasons. First, the roots of current economic issues lie in the near and sometimes even the far past. Second, economic mechanisms operate over time, so the only way to study them properly is by using a historical perspective. Third, gathering data over long periods enables us to improve the tests of many economic theories. The time this book covers begins with 1950, when most Israeli statistics began, although some issues that the book addresses use data from the Mandatory period as well. The book ends with 2018, which is the last year with available data at the time of writing.

I finished writing the first draft of the book in January 2020. There was some early news on a new mysterious virus in China, but it seemed far away and irrelevant. Within a short time, we were in the midst of the coronavirus global pandemic and in a deep economic recession. I did not include this development in the main analysis of the book. First, it is too early to analyze it properly, as the events keep unfolding. Second, this event is global and similar in many countries, so it might not add much to include it in a book that analyzes special lessons from the Israeli experience. However, in various places in the book, I have added references to this current dramatic development.

The book deals at length with the Israeli-Arab conflict and its economic effects. It shows that the conflict has a huge impact on the Israeli economy—on its output, budget, business cycles, inflation, balance of payments, and much more. This is not surprising, as the conflict has been

central to life in Israel for more than 100 years. What is sometimes surprising is how little attention most Israeli economists have given to the conflict. However, despite the wide discussion of the economic costs of the conflict, we should always remember that the main cost is lost human life. While I do not emphasize it enough in the book, I wish to stress this point here. It is important to me personally, as I participated in both the Yom Kippur War and the Lebanon War and lost friends in these wars.

This book is an English version of a book in Hebrew, with a similar title, published in February 2018. The two books have much in common, but there are also big differences in structure and in topics covered. The main difference between them is the audience that each version of the book targets. The Hebrew book tries to explain to Israelis the economy they live in. The English book tries to inform those readers who live far from Israel what they can learn from the experience of this country. I believe that they can learn quite a lot.

1. Even many Israelis share this view. One of Israel's prime ministers, Ehud Barak, described it once as "a Villa in the Jungle."

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On a more personal note, I am grateful to my late parents, Asher and Yocheved Frieda Zeira, who nurtured my interest in learning and in science, to whom I dedicated the Hebrew version of the book. Finally, I am extremely grateful to my wife, Anat Zeira, who supported me throughout this project, and my daughters Noa and Yuli, who accompanied the writing of the book with much love and enthusiasm. I dedicate this book to them.

THE ISRAELI ECONOMY

Map of Israel

1
Historical Background

This chapter describes the historical background to the economy of Israel. Clearly, this is not a full history of Israel, as it focuses only on the main historical processes that are crucial for understanding the Israeli economy. These processes are the Jewish-Zionist immigration to the country, the Israeli-Arab conflict, and nation building. These three processes intertwine strongly with one another. The Israeli-Arab conflict would not have erupted without the waves of Jewish immigration that posed a growing threat to the local Arab community. Similarly, the Jewish immigration was not an act of individuals, as most immigrations are. It was part of a political project, Zionism, whose goal was to renew Jewish nationalism in the country. This strongly linked the building of national institutions to Jewish immigration.

The history of Israel reflects a country that has changed dramatically over the years. In the nineteenth century, it was a collection of districts in the Ottoman Empire. During World War I, the British Army conquered it and the rest of the Middle East. Following their victory over the Ottomans, Britain and France divided the Middle East between them according to the Sykes-Picot Agreement.[1] Palestine became a British Mandate in 1922.[2] In 1947, the United Nations reached a resolution on the partition of Palestine into two states, one Jewish and one Arab.[3] Following the rejection of the resolution by the Arab states and the Palestinians, a war broke out. In the middle of that war, on May 15, 1948, the British Mandate ended, and the State of Israel was established. After the 1949 Armistice Agreements between Israel and the Arab countries, which ended its War of Independence, the State of Israel controlled 78 percent of the territory of the country. This changed again in June 1967, when Israel occupied all of Western Palestine, the Golan Heights, and the Sinai Peninsula. Israel withdrew from Sinai in the Peace Agreement of 1979 with Egypt, but the remaining territories (the West Bank, the Gaza Strip, and the Golan Heights) are still under occupation, and their permanent status has yet to be determined.[4]

Jewish Immigration: Description

The main process behind the development of Israel has been the rapid growth of the Jewish population in the country since 1882 by means of immigration. Prior to that year, Jewish immigration was relatively small. In 1881, on the eve of the Zionist immigration, the Jewish population, called the “Old Yishuv,” numbered only 24,000.[5] These Jews lived mainly in the four holy cities of Jerusalem, Hebron, Safed, and Tiberias, where Jewish communities had existed for hundreds of years. In the nineteenth century, Jews began to settle also in Jaffa, Akko, and Haifa.[6] Many of them lived on religious donations, but some, mainly Sephardim, lived by engaging in retail, trade, and crafts. There were some early attempts at modernization in the Old

Yishuv, in production, education, and even the foundation of an agricultural settlement (Petah Tikva, established in 1878). However, these attempts were minor and did not significantly change the Jewish community.[7]

Change began in 1882, after the pogroms in Russia in 1881, which were triggered by the murder of Tsar Alexander II. These pogroms, together with the dire economic conditions of Jewish life in Russia and Poland, led to a massive emigration from Eastern Europe. Most of the Jews went to the United States, numbering 3.7 million Jews between 1880 and 1929.[8] Some emigrated to Europe, and only a handful of idealists went to Palestine. They belonged to a movement called Hovevei Zion (Lovers of Zion), and they formed the first wave of immigration. This movement soon became part of a wider national movement, Zionism, founded by Theodor Herzl in 1897. From then on, Jewish immigration to the country was the result not only of the terrible hardships of Jewish life in Eastern Europe but also of strong national aspirations, influenced by the general rise of national movements in Europe at the time and supported by the Zionist movement.[9]

Over the years, more waves of Jewish immigration to Palestine followed, becoming larger over time, and within a few decades, they changed the country beyond recognition demographically, geographically, politically, and economically.

Table 1.1 shows how the country's demography changed dramatically over the years. While at the beginning of the period, in 1880, Jews constituted less than 5 percent of the population, in 1947, toward the end of the British Mandate, they were already close to a third of the population. This enabled them to declare independence and to win the war of 1947–1949.[10] In the following three years, 1948–1950, the Jewish population doubled with the large immigration of the Holocaust survivors from Europe and entire Jewish communities from Syria, Yemen, and Iraq. At the same time, the Arab population declined drastically, both because Israel did not include the West Bank and Gaza, and because most Palestinians who had previously lived in the Israeli area became refugees.[11] After 1950, Jewish immigration to Israel continued, and the population grew quickly. From 1950 to 2018, total population grew 6.5-fold, and the Jewish population grew 5.5-fold.

Like all migrations, the Jewish immigration was driven by both push and pull forces. The push factors in the countries of origin were persecutions, wars, and economic hardship. The pull factors were religious; strong sentiments for the Jewish homeland; national aspirations; security; and more recently, Israel's economic prosperity. The push forces explain why immigrations usually come in waves, when troubles hit countries of origin, and it was true for the Jewish immigration to Israel as well. This is important for the economic analysis in this book, because the variation in immigration over time helps us identify the economic effects of immigration. I next describe briefly the immigration waves since 1882.[12]

TABLE 1.1. Population in Palestine and in Israel, selected years, 1890–2018 (thousands at end of year)

Year	Population	Jews	Non-Jews	Comments
1880	549	24	525	
1914	683	85	595	
1922	768	84	683	First British census
1931	1,036	175	861	
1939	1,505	449	1,056	
1947	1,970	630	1,340	

1948	1,015	759	156	Only in the State of Israel
1950	1,370	1,203	167	
1960	2,150	1,911	239	
1970	3,022	2,582	440	Arabs of East Jerusalem added in 1967
1980	3,922	3,283	639	
1989	4,560	3,717	843	Eve of ex-Soviet Union immigration
2000	6,369	4,955	1,414	225 thousands non-Jews and non-Arabs
2010	7,695	5,802	1,895	320 thousands non-Jews and non-Arabs
2018	8,968	6,664	2,303	425 thousands non-Jews and non-Arabs

Source: Data for the Ottoman period are from Gorny (1987); for the British Mandate from Metzer (1998, table A.1). Data after 1948 to the present are from Central Bureau of Statistics (2019, table 2.1).

THE FIRST ALIYAH, 1882–1903

The first immigration wave was mainly from Russia, but it coincided with the arrival of a small group of Jews from Yemen as well.[13] This first wave of 20,000–30,000 immigrants was already part of the great Jewish migration from Eastern Europe. While previous Jewish immigrants to the Holy Land settled among the Arab population in existing towns and communities, the new immigrants established separate Jewish settlements. These were the early moshavot.[14] Among them were Rishon LeZion, Zikhron Ya'akov, Rosh Pinna, Ekron, Yesud HaMa'ala, Ness Ziona, Gedera, Rehovot, and Hadera. The establishment of separate settlements was the beginning of a geographic separation between Jews and Arabs, which remains a dominant pattern in Israel today.

THE SECOND ALIYAH, 1904–1914

This immigration followed the failed Russian Revolution of 1903, and most immigrants were young Zionist-Socialists from Russia who belonged to the movements Poalei Zion and Hapo'el Hatza'ir. Between 30,000 to 40,000 immigrants arrived, although many left, especially during the difficult years of World War I. This immigration put the labor movement in a leadership position in the Zionist movement. Its most prominent leaders were David Ben-Gurion, A. D. Gordon, Berl Katzenelson, Yitzhak Ben-Zvi, and Levi Eshkol. This immigration continued to establish separate Jewish settlements. They built the first kibbutzim (agricultural collective settlements), but they also laid the foundations for the first Jewish city, Tel Aviv (1909).

THE THIRD ALIYAH, 1919–1923

These 35,000 immigrants had two main motives. The pushing motive was the Russian Revolution of 1917, and the pulling motive was the new British rule in Palestine and its promise, expressed in the Balfour Declaration, to promote a "national home" for the Jewish people in Palestine.[15] Despite the high hopes that followed this declaration, this immigration was still small and consisted mainly of young idealists from Eastern and Central Europe. The Jewish masses continued to go to the United States. The immigration to Palestine continued to establish separate Jewish settlements, mainly kibbutzim and moshavim.[16]

THE FOURTH ALIYAH, 1924–1932

This was the first Jewish mass immigration to Palestine, of 82,000 immigrants, mainly from Poland. They escaped its dire economic conditions and the growing anti-Semitism in the country,

also reflected in the policies of the Minister of Finance Wladislaw Grabski. It was mass immigration not only by number but also by composition, as entire families arrived, whereas previous immigrations had many young idealist pioneers.

The beginning of mass immigration of Jews to Palestine in 1924 was not incidental. That year the United States passed the Johnson-Reed Act, which greatly reduced immigration quotas of ethnic groups from outside the Western Hemisphere. Among these groups were East European Jews, and the act greatly reduced their ability to enter the United States.[17] Thus, many Jews in Poland, at the time the largest Jewish community with 3.5 million, chose Palestine instead. This had a dramatic effect on the Zionist project. After three small immigration waves came the first mass immigration, which has since become the main type of Jewish immigration to the country. Actually, in 1925 the number of Jewish immigrants to Palestine exceeded the number of Jewish immigrants to the United States.[18]

The Fourth Aliyah continued the pattern of separate Jewish settlements, this time mainly urban. Many came to Tel Aviv, which more than doubled in population during these years. The newcomers also built other towns, such as Herzliya, Bnei Brak, Kiryat Ata, Bat Yam, and Netanya. The professional skills of the immigrants and the money they brought with them made them pioneers in industry, trade, and crafts.

THE FIFTH ALIYAH, 1933–1938

Mass immigration resumed in 1933, after the rise of the Nazis to power in Germany. It spread fear in central and Eastern Europe, and 197,000 Jews arrived mainly from Germany and Poland. The immigrants from Germany were highly educated, which contributed much to building the education system in the country. The Fifth Aliyah expanded the map of Jewish settlements to new towns like Holon and Nahariya, and also to many kibbutzim and moshavim.

THE SIXTH ALIYAH, 1939–1948

During World War II, Jewish immigration to Palestine declined, as Jews were trapped in Europe under German occupation, and the Mediterranean was almost closed to seafaring. In addition, the British “White Paper” of 1939 imposed restrictions on Jewish immigration, as a reaction to the Arab Revolt of 1936–1939. Still, 138,000 immigrants arrived during this period, a fifth of them from Arab and Muslim countries, a larger share than before. After World War II, in 1945–1948, many immigrants arrived illegally to challenge the British restrictions. They were mainly Holocaust survivors, who were desperate to leave the refugee camps in Europe and go to Palestine.

THE GREAT ALIYAH, 1948–1951

Following the establishment of the State of Israel on May 15, 1948, a wave of 688,000 immigrants arrived, doubling the population of the country in 3 years. Half were Holocaust survivors from the refugee camps in Europe, who could now come freely. The other half were Jews from Arab countries, who found themselves in a dangerous situation with their countries fighting their own people and facing growing animosity from their Arab neighbors. Many such communities chose to immigrate to Israel, initially from Syria, Iraq, and Yemen.[19] This large immigration created desperate needs for housing and jobs in the young state. Most immigrants landed in temporary camps of tents and sheds, called “maabarot,” where living conditions were

harsh. Some camps were in the center, but many immigrants had to settle in the periphery, to solidify the new borders of Israel.[20]

IMMIGRATION FROM NORTH AFRICA, 1956–1965

Following Gamal Abdel Nasser's rise to power in Egypt and the Sinai (Suez) Campaign of 1956, the Jews left Egypt, followed by Jewish migration from other North African countries.[21] The main drivers of this migration were the Israeli-Arab conflict and the end of French colonial rule in North Africa. Some 465,000 Jews arrived during these years, of which 209,000 were from North Africa. The others came from East European Communist countries, mainly Romania and Poland.

IMMIGRATION AFTER THE 1967 WAR, 1969–1973

The victorious war triggered high enthusiasm in the Jewish world, and a new wave of immigration came to Israel, mainly from developed countries. The total number of immigrants was 228,000, of which 184,000 came from Europe and America. Some came from affluent countries; others came from the Soviet Union, being able to leave it for the first time, although in small numbers. Still others were young Latin Americans who were fleeing totalitarian regimes.

IMMIGRATION FROM THE FORMER SOVIET UNION AND ETHIOPIA, 1990–2000

In 1989–1990, the Soviet Union collapsed. One of the results of this dramatic event was the opening of its gates to allow Jewish emigration. Some went to Germany, the United States, and Canada, but most immigrated to Israel.[22] During the 1990s, about 1 million Jews immigrated to Israel, of which 376,000 came in 1990–1991. The immigration continued, though at a lower rate, until 2000. In addition to the former Soviet Union immigrants, 47,000 came from Ethiopia during these years.

Jewish Immigration: Characteristics

Figure 1.1 gives further support to the claim that Jewish immigration to the country was not a smooth process but took place in waves. The figure shows the numbers of immigrants in each year relative to the existing population at the beginning of the year (which is the Jewish population during the British Mandate and total population of Israel during the State years).

Figure 1.1 is informative on how large the effect of immigration was and on the difficulty of absorbing it. In relative size, the largest wave was the Fourth Aliyah. In 1924, immigrants increased the Jewish population by more than 35 percent. The Fifth Aliyah also stands out: In each of the years 1935–1939, immigrants increased the Jewish population by 20 percent. A third large wave is the Great Aliyah in 1948–1951, when immigrants increased the population by an annual average of 18 percent. The fourth significant wave is the immigration from the ex-Soviet countries in the 1990s. Its annual relative size was lower, since in 1989 Israeli population was already large, at 4.5 million. However, the million immigrants increased the population of Israel by 20 percent over 10 years.

Figure 1.1 also reinforces the importance of 1924, when mass immigration began. From 1882 to 1923, 40 years and three immigration waves increased the Jewish population from 24,000 to only 90,000. However, in the 23 years from 1924 to 1947, 428,000 immigrants came and

significantly changed the demographic balance in Palestine. This further highlights the contribution of the Johnson-Reed Act of 1924 in the United States to the success of Zionism in the twentieth century. What the Zionist movement could not achieve until then, despite all its efforts, became possible once the American gates closed for Jewish immigration. The Jews of Eastern Europe, who felt the ground shaking under their feet, came in growing numbers to Palestine. The immigration of pioneers and idealists finally became mass immigration.

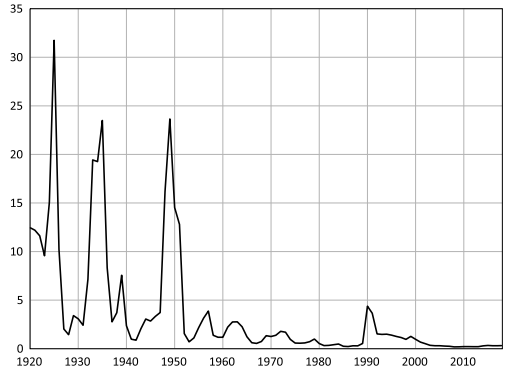

FIGURE 1.1 Annual immigration relative to beginning-of-year population, 1920–2018 (percent).
Data from Mandatory period are from Metzer (1998, table A.3) and after 1948 from Central Bureau of Statistics (2019, table 2.53).

The Jewish immigration changed the country beyond recognition in several respects:

Demography: Jewish immigration increased the Jewish presence in the country from a negligible minority in the beginning of the British Mandate to one-third toward its end. After 1948, immigration increased the Jewish population of Israel by ten times and made the Jewish State a solid fact.

Geography: Most Jewish immigrants did not settle among Arabs but established separate Jewish settlements. They settled mainly in the coastal plain and in the valleys, but some also settled in the Galilee and in the Negev. Some of these settlements became large cities. Hence, immigration significantly changed the physical map of the country.

Politics: The Jewish immigration led to a violent conflict with the Palestinians, which expanded in 1948 to a wider conflict with the entire Arab world. The immigration also increased Jewish population to a point of being able to demand self-determination and to establish the State of Israel, significantly changing the political map of the Middle East.[23]

Economics: The Jewish immigrants built a thriving economy based on agriculture (in which they had no previous experience), industry, high-quality education, and services. The economic development of the Yishuv, and later of Israel, transformed within 50 years a poor country into one of the thirty most developed countries in the world.

Institutions: The Jewish immigration was not only an act of individuals but also part of a political project, Zionism. The Zionist movement encouraged immigration and created the necessary conditions for successful absorption of the immigrants. It did so by promoting economic growth, which provided housing, jobs, and institutions that improved the lives of immigrants.

Finally, it is useful to compare the Jewish immigration to Palestine and Israel to other migrations in modern history. One similarity is that all migrations are not continuous, but come

in waves, since they respond to bad conditions in the countries of origin, like the great Irish famine in the mid-nineteenth century. The immigration waves to Palestine and Israel followed a similar pattern. The waves of immigration followed the terrible conditions in Poland between the two World Wars; the rise of Nazism; the Holocaust; the wars between Israel and the Arab countries; and more recently, the collapse of the Soviet Union.

Another similarity between the Jewish immigration to Israel and other migrations is that good economic conditions in the receiving country are required for immigration. This has been the case for the United States almost throughout its history, and in Europe in this century. Similarly, Jewish immigration to Palestine and Israel declined during the economic crisis of 1927–1928, during the recessions of 1952–1953 and 1966–1967, and during fiscal crisis and high inflation in 1973–1985. Ben-Porath (1986a) also confirms that good economic conditions in Israel encouraged immigration.

However, the Jewish immigration to Palestine and Israel differed from most other migrations in two main aspects. First, most of the immigrants had middle-class backgrounds, education, and moderate financial means far above those of immigrants in other modern episodes. The reason is that while most immigrants leave due to economic hardships, Jewish immigrants left mainly for national and religious reasons. Part I in this book shows that this was relevant to Israel's economic success. A second difference from other immigrations is that the Jewish immigration was part of a national movement. Zionism, the political movement that encouraged and supported this immigration, was instrumental to its success.

The Israeli-Arab Conflict: The Beginning

As shown above, Jewish immigration to Palestine increased Jewish presence in the country beginning in 1882 and especially since 1924. The immigrants, who came under the umbrella of Zionism, built villages and towns and established institutions like schools, journals, universities, companies, and even defense organizations. The indigenous Arab population soon understood the significance of this development and viewed it as a serious threat.

This was the background to the Jewish-Arab conflict. However, it took time to brew. Some local clashes between Jews and Arabs took place at the beginning of the Zionist settlement, but these were rather random and rare. The clashes evolved into a national conflict only after the British occupation in 1917.[24] The Ottomans, who had ruled the country before, established a stable regime that lasted more than 400 years, under which many ethnic and religious groups lived in mostly peaceful coexistence. As many believed that this situation would last forever, they viewed local national aspirations as unrealistic and hesitated to follow them. Only toward the end of the nineteenth century did a general Arab national consciousness begin to develop.

The British occupation of Palestine ended this status quo for several reasons. First, the sudden disappearance of the Ottomans made national aspirations seem more realistic. Second, the British arrived with two conflicting national promises. On one hand, they promised the Arabs independence, in return for their help in winning the war in the Middle East.[25] The promise was vague, and it did not refer directly to Palestine; nevertheless, it encouraged the Palestinians to exert pressure on the new British government in their favor. On the other hand, the British delivered to the Zionists the Balfour Declaration in 1917, which promised support of a Jewish national home in Palestine. With Palestine under their rule, they could fulfill the promise. These two conflicting promises caused both sides to hope that with enough political pressure, they

could tilt the scales in their favor. This explains the first major outbreak of the conflict in 1921.[26]

Despite the importance of the British promises to both sides, the main motivation behind the escalation of the conflict was Jewish immigration, as shown by the correlation between outbreaks of the conflict and waves of immigration. The events of 1921 happened after the arrival of the Third Aliyah in 1919, and the events of 1929 erupted after the Fourth Aliyah. Interestingly, H. Cohen (2015) describes the events of 1929 as the true beginning of the Jewish-Arab conflict and indeed, the fighting broke out after the beginning of mass immigration in 1924. The Arabs realized that the Jewish presence in the country was no longer negligible but significant and growing fast, due to large influxes of Jews. Similarly, the Arab Revolt of 1936–1939 broke out at the peak of the Fifth Aliyah.

From early on, the Palestinians focused on one main demand from the British: to stop the flow of Jewish immigration. For a long time, the British refused to comply with this demand, which contradicted the Balfour Declaration and the mandate by the League of Nations. However, under Palestinian pressure, mainly due to the Arab Revolt, eventually the British changed their position. The famous White Paper of 1939 imposed severe restrictions on Jewish immigration.

Jewish immigration contributed to the conflict not only by raising Palestinian resentment but also by increasing Jewish self-confidence. As their number increased to a third of the population in the 1940s, and being much better organized than the Arabs, their willingness to fight for independence increased, and their demands became more daring. In the 1940s, the Biltmore Plan already demanded a Jewish state. The Zionists also put significant pressure on the British Mandate by increasing the illegal immigration of ships that arrived by night on the beaches. These developments helped bring the Mandate to its end and expedited the onset of the war of 1947–1949.[27]

The Main Eruptions of the Conflict

The history of the Israeli-Arab conflict reveals two patterns, which are of great importance to the economic analysis of the conflict. One is that violence is not continuous over time but erupts every few years. The second is that the conflict has changed its scope and character several times over the years. Recognizing these two types of variation in the conflict can help researchers study and identify the effects of the conflict on the economy.

The following list of eruptions demonstrates the first phenomenon that violence breaks out only once in a few years, while between these eruptions, the conflict is contained.[28]

THE EVENTS OF 1921

The events[29] broke out in Jerusalem following the Nebi Musa celebrations but expanded to other areas, such as Jaffa (among those murdered was the famous writer Y. H. Brenner).

THE EVENTS OF 1929

These events followed clashes over the prayer arrangements at the Western Wall in Jerusalem, and quickly spread to other places. The most deadly attack was in Hebron, where Arabs killed dozens of Jews, and Jewish life ceased to exist there afterward.

THE EVENTS OF 1936–1939

These were more intense and longer than earlier events, and indeed, the Palestinians call it “the Arab Revolt.” The Palestinians fought not only against the Jews but also against the British, demanding that Jewish immigration be stopped. The British brutally suppressed the revolt, but the publication of the British “White Paper” in 1939 shows, that despite its military failure, the revolt achieved its main political goal.

THE WAR OF INDEPENDENCE, 1947–1949

The war began immediately after the UN resolution on the partition of Palestine in November 1947. Its first stage was limited to a war between the Jewish and Arab communities. In April 1948, it became clear that the Jews were winning, and most Palestinians from the area intended for the Jewish state left their homes or were expelled by force. That started the problem of Palestinian refugees, and it is why the Palestinians call this war “Nakba” (“disaster”). As the British left and the Yishuv declared the State of Israel in May 1948, Arab armies from Egypt, Jordan, Syria, Iraq, and Lebanon invaded the country and joined the war. At its end in 1949, Israel controlled 78 percent of the territory of Palestine, more than it got under the UN plan. The Armistice Agreements with the neighboring Arab countries set the temporary border of this territory, the “Green Line,” which survived for 19 years. The number of Israelis who died in the war was about 6,000, close to 1 percent of the population.

THE SINAI CAMPAIGN, OCTOBER 1956

In this war, also called the Suez Campaign, Israel attacked Egypt after a long period of border clashes due to infiltration of Palestinians into Israel and to Israeli retaliations. The attack was coordinated with Britain and France, who planned to conquer the Suez Canal and return it to their control after Egypt had nationalized it. Israel conquered the Sinai Peninsula within a week, but it had to withdraw back to its previous borders within a few months, due to joint pressure by the United States and the Soviet Union. Israel lost 172 soldiers in the war.

THE SIX-DAY WAR, JUNE 1967

In May 1967, Egypt sent army forces to Sinai in violation of the demilitarization agreements, removed the UN forces from the border, and closed the Red Sea to Israeli ships. These moves created great tension between the sides; after a few weeks, Israel attacked Egypt and conquered the Gaza Strip and the Sinai Peninsula up to the Suez Canal. As Jordan and Syria joined the fighting, Israel captured the West Bank from Jordan and the Golan Heights from Syria as well. Israel lost 776 soldiers in the war. Unlike the Sinai Campaign, Israel remained in the occupied territories without much pressure to withdraw, partly due to growing US support. This led to two important results. First, Israel now controlled, for the first time, all of Palestine and the Palestinians who lived there, which changed dramatically their role in the Israeli-Arab conflict. Second, remaining in the territories after the war increased the tension between Israel and its neighbors, which led to an escalation in the Israeli-Arab conflict.

WAR OF ATTRITION, 1968–1970

As the Arab world did not accept the results of the 1967 war, the War of Attrition began soon after. This was a static war, mainly with Egypt along the Suez Canal, but also with Syria on the Golan Heights and along the Jordan River against the new Palestinian organization, Fatah, which

was part of the Palestinian Liberation Organization (PLO). In the War of Attrition, Israel suffered 1,424 fatalities, twice as many as in the Six-Day War.

YOM KIPPUR WAR, OCTOBER 1973

This war, also called the "October War" or the "Ramadan War," began when Egypt and Syria attacked the Suez Canal and the Golan Heights, respectively. The attack was part of the Arab effort to force Israel to withdraw from the territories occupied in 1967. The war was fierce. It lasted three weeks, and Israel suffered a great loss of life, 2,297 soldiers. It also lost much equipment and ammunition, so the economic cost of the war was heavy as well. In retrospect, we can say that this war paved the way to the 1979 Peace Agreement with Egypt, where Israel withdrew from Sinai in return for full peace, mutual recognition, and diplomatic relations.

THE 1982 LEBANON WAR

Israel began the war with two main goals. The explicit goal was to push the PLO forces from southern Lebanon, from which they could fire rockets on Israeli towns and villages in the north. The PLO forces settled in Lebanon, after they escaped Jordan in the "Black September" of 1970. An additional implicit goal of the war was to intervene in the Lebanese civil war, which began in 1975, in support of the Maronite Christians. Israel achieved the explicit goal within a few months, when the PLO forces left Beirut and Lebanon, mainly to Tunisia. The other goal of the war failed completely. Not only did Israel fail to impose the Maronite militias on Lebanon, but it also created a new enemy. The Shiites in southern Lebanon formed a strong militia, Hezbollah, which began a guerrilla war against Israeli forces in Lebanon. In 2000, 18 years after it invaded, Israel withdrew completely from Lebanon, after suffering 1,216 fatalities in this war.

THE FIRST INTIFADA, 1987–1993

This was the first widespread Palestinian uprising since the Israeli occupation of the Palestinian territory in 1967, and in fact the first direct Palestinian-Israeli confrontation since 1948. The Intifada began with demonstrations, stone throwing, strikes, and boycotts of Israeli goods, but later deteriorated to the use of arms. The PLO directed the Intifada from abroad, but soon a new force emerged, Hamas, the Palestinian branch of the Islamic Brotherhood. Some 200 Israelis and 1,200 Palestinians died in the First Intifada. In 1988, the PLO agreed to partition into two states, thus paving the way for peace talks with Israel. The negotiations between Israel and the PLO began after the election of Yitzhak Rabin to be the Israeli prime minister in 1992 and led to the Oslo Agreements in 1993. The agreements included mutual recognition, establishment of temporary Palestinian Autonomy in the territories, and promised to reach a Final Status Agreement within five years. The Oslo agreement also enabled the peace agreement between Israel and Jordan in 1994.

THE GULF WAR, 1991

Following the occupation of Kuwait by Iraq, the United States led a large coalition of countries to fight Iraq in "Operation Desert Storm." Israel was not part of the coalition, but Iraq fired many conventional missiles at Israel. Israel held back and did not respond, so its part in the war was passive, and it suffered very few casualties.

THE SECOND INTIFADA, 2000–2005

In July 2000, negotiations on the Final Status Agreement between Israel and the PLO at Camp David failed. Tensions between the sides increased, and in September, the intifada began (the Palestinians call it the "Al Aksa Intifada"). The Second Intifada was more intense than the first, with greater use of firearms, and hence it caused more fatalities: 1,100 on the Israeli side and close to 5,000 on the Palestinian side. Israel suppressed the intifada by the use of large military campaigns. The Second Intifada ended in 2005 with the Disengagement from the Gaza Strip. This was a unilateral withdrawal from the Gaza Strip, including demolition of the settlements there.

THE SECOND LEBANON WAR, 2006

This was a relatively minor war between Israel and Hezbollah. It erupted mainly due to unsettled issues from the previous war in Lebanon, such as the status of the remaining Lebanese prisoners in Israel and border issues. Israel suffered 170 fatalities in this war.

THE OPERATIONS IN GAZA, 2006–PRESENT

Israel left the Gaza Strip in 2005 but continued to control its borders by land, sea, and air. In fact, Israel put Gaza under a siege, which intensified after Hamas' victory in the Palestinian Authority elections in 2006, and further after Hamas took over the security forces in Gaza in 2007. The Gazan answer to the siege was the development of "Qassam" rockets that enabled Hamas to harm routine life in Israel around the Gaza Strip. The tension along the border between Israel and Gaza is high and has led to several eruptions in 2006, 2008, 2012, and 2014. The heaviest fighting took place in 2014, killing 73 Israelis and more than 2,000 Palestinians.

Figure 1.2 presents the annual number of Israeli military fatalities. It demonstrates the pattern of eruptions in the Israeli-Arab conflict and between them years of relative calm. Note that figure 1.2 also shows a trend of rising fatalities over time in calm periods, as the number of fatalities includes not only soldiers killed in action but also in accidents. This leads to an upward trend, as the population and the size of army grow. Figure 1.2 also shows a marked rise in the number of fatalities in the years 1967–1977, when the Israeli-Arab conflict intensified significantly.

Changes in the Type and Intensity of the Conflict

Until 1948, the conflict was between two ethnic communities in the same country. Militarily, it was a conflict between militias, because neither side could build a real army, as it was illegal under the British rule. Thus, until 1948, it was a narrow conflict, only between Israelis and Palestinians, with low costs, in terms both of human life and of arms and ammunition. In 1948, with the invasion of Arab armies, the conflict expanded from a narrow to a wide conflict between Israel and all Arab countries.

It is hard to explain this expansion of the conflict. The Arab countries claimed that they invaded Palestine to help the Palestinians, but they may also have hoped to grab some Palestinian territories, as Jordan captured the West Bank and Egypt the Gaza Strip. Another explanation is that the establishment of Israel, in its exceptional location, divided the Arab world into two separate areas, thus harming it significantly. A fourth explanation is that Palestine was holy and had been important to Islam for more than 1,300 years. Whatever the explanation, the change in

the conflict in 1948 was not only political but also military and economic. From a militia conflict, it upgraded to a conventional military conflict. Thus, it became much more costly in human life, arms, and ammunition, as fighting involved not only infantry, but also tanks, artillery, air forces, and navies.

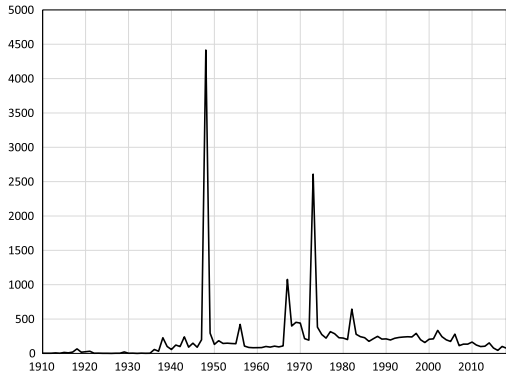

FIGURE 1.2. Annual military fatalities, 1910–2018.
Data are from the Ministry of Defense. See Freedom of Information (2018).

The Israeli-Arab conflict remained wide for more than 30 years, until the 1979 peace with Egypt. This was peace with one country only, but it was with the strongest Arab country militarily. Since forming an Arab fighting coalition against Israel became impossible without Egypt, the wide Israeli-Arab conflict ended de facto. Chapter 5 supplies additional evidence that the wide conflict indeed ended in the 1980s.[30]

The Palestinians were early to recognize that the wide conflict with the Arab countries ended and that no one would fight for them any more. This realization triggered the First Intifada in 1987. Since then, the conflict has returned to its pre-1948 shape, as a narrow Israeli-Palestinian conflict. The type of fighting changed as well, from conventional warfare to militia fighting. Although it is the army that fights on the Israeli side, it uses mainly infantry, which is similar to using a militia. On the Palestinian side, there are two major militias since the First Intifada, Fatah and Hamas. A conflict between militias is much less costly than the conventional wars of the past.

The list of eruptions together with figure 1.2 show that even during the period of the wide conflict, there were large variations in military activity. The 10 years after 1967 were years of a significant rise in the intensity of the conflict. Instead of one eruption in a decade, as before 1967, this decade saw three wars: the Six-Day War, the War of Attrition, and the Yom Kippur War, and all three were costly. A plausible cause for the rise in intensity of the conflict after 1967 is that Israel did not withdraw from the territories it had conquered in the war, unlike after the 1956 Sinai campaign. As a result, Egypt, Jordan, and Syria continued to apply military pressure on Israel to withdraw from these territories. The high intensity of the conflict after 1967 had many economic consequences, as shown in chapter 5.

Building a New Nation

The new nation of Israel built many institutions: economic, governmental, social, and cultural. Over the past 100 years, Israelis have invested a huge creative effort in these institutions to support the Zionist goal of absorption of the immigrants and their integration into a nation. The

history of these institutions is important not only in itself but also helps to understand the present as well, since institutions have strong inertia and change slowly over time. Thus, understanding many current Israeli institutions, like the Histadrut (General Union of Workers in Israel), the Labor Party, or the Jewish Agency, requires knowledge of how these institutions began and what their original purposes were. The conditions in which these institutions were born have long changed, but the institutions themselves have changed too little and too slowly since then. In general, institutions are of great importance for the functioning of the economy.[31]

The brief discussion in this chapter cannot cover all aspects of Israeli institutions, so it focuses on four issues only. The first is that the institutions established by the Zionist movement were for Jews only. The second is the great role of the political parties in Israel. The third issue is how the labor movement dealt with the tension between its two ideologies, Zionism and Socialism. The fourth issue is the gaps between European Jews and Jews from Arab and Muslim countries.

ZIONIST INSTITUTIONS

The Zionist movement made great efforts to absorb the immigrants successfully, hoping that it would encourage immigration of more Jews. To achieve this goal, it built institutions that were by nature for Jews only. An example of such institutions were the Zionist political parties, which helped absorb new members on arrival in the country. These were clearly Jewish parties. After the establishment of the State of Israel, these parties remained the leading political parties, and they kept their Zionist character. As a result, only few Israeli Arabs could join these parties, which remains the situation today.[32]

Another example of institutions for Jews only is the Jewish Agency and its related institutions. The Jewish Agency was the representative of the Yishuv before the British authorities, and it actually functioned as a government of the Yishuv. After the establishment of the State of Israel, the Jewish Agency remained active, with two main goals. One was to promote Jewish immigration to Israel, and the second was to build new settlements. Naturally, these settlements were for Jews only. A related institution was the Jewish National Fund, which purchased land for Jewish settlement during the Mandatory period. After 1948, this institution controlled a large share of the land in Israel. As such, it contributed to discrimination against Israeli Arabs in land use.[33]

The discrimination was much worse in the early years of Israel, especially due to the military rule imposed on Arab towns and villages, which lasted until 1966. Discrimination declined over time, but it has never fully ended. One channel is through labor markets, as described in chapter 13, where Arabs find it hard to find jobs in firms that work with the defense establishment. However, the toughest discrimination is in the area of land development and housing, as described above.

The Yishuv also established educational institutions: primary schools, high schools, and even two institutions of higher learning (the Hebrew University of Jerusalem and the Technion, a technology institute in Haifa). All schools taught in Hebrew and were open to Jews only during the Mandatory period. With the establishment of the state, these schools became a public education system that consists of three separate systems: state, state-religious, and Arab, while only universities are open to all. Hence, to understand why Israel has separate educational systems for Jews and Arabs, it is necessary to keep in mind the Mandatory period and the

separate settlements of Jews that began very early.

The Zionist movement established many more institutions. A major one was the general labor union, the Histadrut, which also created additional institutes that supplied jobs; housing; pension funds; and health care, such as Kupat Holim and its hospitals.[34] The Histadrut organized only Jewish workers during the Mandatory years. After 1948, it accepted Arabs in a separate "Arab department." Only after 1966 did Arab workers become full members of the Histadrut. The Zionist movement created additional health-care and housing institutes outside the Histadrut as well, like the housing company Rassco (Rural and Suburban Settlement Company), the Hadassah hospitals and other health funds. It also created institutes to promote science, such as the Weizmann Institute, the Academy of the Hebrew Language, and the National Library. Other institutions, like publishing houses, newspapers, and theaters, promoted culture and the arts. Most of these institutions continued to operate after 1948, and many remain exclusively for Jews to this day.

Hence, the story of how separate institutions for Jews began is not just history but is part of the explanation of how Israel operates today. The separation was understandable under the British Mandate, in a period of immigration absorption and national consolidation. As institutions are highly inertial, many still remain separate. Nevertheless, the separation is also a longstanding policy of the Israeli government and not only a result of the inertia of institutions. There are many examples of this policy, like the widespread land confiscations in 1976 and the recent attempts to evacuate Bedouin settlements from their land. These policies reflect how the continuing conflict between Israel and the Arab world affects the relations between Jews and Arabs in Israel. Part of this policy operates by keeping the separating institutions active.

THE STRONG PARTIES

Among the institutions built in Palestine, the Zionist parties were uniquely strong, far more so than political parties in other countries. These parties used to own and operate school systems, health funds, newspapers, publishing houses, banks, and even militias.[35] How did the Zionist parties acquire such organizational and economic power? One explanation is that since Zionism was a national-political project, parties played an important role in it. The Zionist movement formed in 1897 and soon became a coalition of Zionist parties, which covered the full political spectrum: left, center, right, and religious.

To understand better the strength of the Zionist parties, it is important to consider their mode of operation. Each of them functioned on a dual basis, in Palestine and in the Diaspora. This enabled them to encourage and organize their supporters abroad to immigrate to Palestine. Even the British Mandate officially recognized this role of the Zionist parties as recruiters of immigrants. The British, who issued immigration permits (called "Certificates"), granted these to the Jewish Agency, which divided them among the various parties.

Hence, the parties acted as importers of the two main factors of production in every modern economy: labor and capital. Most of the immigrants became workers in Palestine, and they came mainly through the parties of the labor movement. However, many immigrants brought with them some wealth, though mostly modest. They arrived mainly from Poland and Germany and belonged to the centrist Zionist parties. These immigrants invested in domestic projects and thus imported capital. They invested in industry, commerce, citrus growing, and other economic areas. During the Mandatory period, immigrants' money funded these investments. In

agriculture, the labor movement built the settlements, kibbutzim, and moshavim, and supplied the labor, but the financing came from Zionist donations, organized by all Zionist parties. Hence, being importers of labor and capital to the growing economy gave these parties a lot of strength.

Of all the Zionist parties, the most powerful and energetic were the Zionist-Socialist parties, which formed the labor movement. In their center was Mapai (the Party of Workers of the Land of Israel), led by David Ben-Gurion. To their left was mainly Hashomer Hatzair, which later became Mapam. From the early 1920s, the labor movement became the leader of the Yishuv and of the Zionist movement in general. They led the process of nation building, all the way to the establishment of the state in 1948, and then through shaping the young country, until 1977. The leadership of the labor movement was widely supported, and they presided over a broad coalition of parties. This coalition included the two liberal parties, the General Zionists at the center-right and the Progressives at the center-left. The coalition also included the religious-Zionist party, Hamizrahi and even a Zionist-Socialist branch of the Ultra-Orthodox party, Poalei Agudat Yisrael. The main opposition to the labor movement during the Mandatory period was the Revisionist party of Ze'ev Jabotinsky on the far right, which even left the World Zionist Organization. After the establishment of the state, the revisionist party became Herut, under Menachem Begin. Later, it joined forces with the General Zionists, who left the coalition with the labor movement, to form the Likud Party. In 1977, they won the elections, formed a government, and ended 60 years of leadership of the labor movement.[36]

THE LABOR MOVEMENT BETWEEN ZIONISM AND SOCIALISM

What explains the rise to power of the labor movement? What enabled it to reach leadership so quickly, even though the movement was far from the center? Without pretending to give a full answer to this question, I would like to offer one explanation, which also connects to later economic policies of the labor movement. It focuses on the movement's flexibility and its ability to adapt to the changing conditions in Palestine.

Workers' movements elsewhere responded mostly to the distress of workers in their workplaces, and hence, struggled mainly for better labor conditions, shorter workdays, and unionization. However, the situation in Palestine was very different. The main problem of workers was not how to cope with the employer in the workplace but rather to find a job. This difference is due to two main reasons. The first was the rapid flow of immigrants, which required a rapid buildup of new jobs. The second was competition for the few existing jobs with the domestic Arab workers, who were willing to work for less and were more experienced, especially in agriculture, which was a large sector at the time. The labor movement developed two main ways to cope with the lack of jobs, which drew a sharp difference between it and typical Socialist parties. The first was to create jobs by itself, by becoming an employer, and the second was to launch a campaign against hiring Arabs, termed "Avoda Ivrit" (Hebrew Labor).

In agriculture, the labor movement created jobs by establishing cooperative settlements, known as kibbutzim and moshavim. This was the preferred solution for Jewish agricultural workers, because once they owned the settlement, they could ensure that only Jews worked there, while the older moshavot, which were privately managed, often employed Arabs. Hence, the cooperative settlements were not only the outcome of labor ideology but also of the desperate need to create jobs for immigrants. However, building settlements required funding for purchase of land and for construction. The funding came from donations, which arrived mainly from

centrist Zionists. This cooperation between Socialists and centrists led the labor movement to inevitably compromise on its socialist principles, since it had to convince its partners that the cooperative settlements were not part of a socialist revolution but rather of a national revolution —Zionism.

The labor movement created jobs not only in agriculture but also in other sectors. The Histadrut, the general labor union of Jewish workers in Palestine, founded in 1920, built a network of companies called "Chevrat Haovdim," namely, the "company of workers." It included construction companies like "Shikun Ovdim," an infrastructure company "Solel Boneh," a financial institute "Bank Hapoalim," a produce distribution company "Tnuva," and many more. By willing to build jobs and by becoming an employer, the labor movement demonstrated its flexibility in adapting to the conditions in the new country. This brought it broad support, not only of the workers but also of others, who realized that the labor movement was working for national rather than for class interests, as it gave Zionism top priority.

The labor movement not only created new jobs but also struggled against hiring Arabs in Jewish workplaces, under the slogan of "Avoda Ivrit." They demanded that Jewish employers should not employ Arabs but Jews, even if it harmed their profits. The wide Jewish public viewed this struggle as support of Zionism and not as an act of narrow class interests. It thus gave the labor movement further popularity, despite its cruelty. In 1929, David Ben-Gurion, then secretary general of the Histadrut, wrote the following, insisting on 100 percent of Jewish labor not only in Tel Aviv but in the moshavot as well:

> The situation of the Jewish worker who immigrates to the country is the opposite of that of any migrant worker in other countries, such as North America, Canada, Australia and more. In these countries, the local worker is at a higher stage of development than the immigrant is. The latter's level of life is lower, and he makes do with little and appears from this as a competitor that harms the local worker and lowers his wage. In this country, the situation is reverse. The immigrant's standard of living, needs and culture are immeasurably higher than those of the local worker. The Jewish worker cannot and does not want to work in the inferior conditions of the Arab worker, and if the Jewish economy does not guarantee jobs to Jewish labor, Jews have nothing to do in this country.[37]

Clearly, such policies of creating jobs, to the extent of becoming a big employer and discrimination on a national-ethnic basis, were very different from the long tradition of socialist movements and trade unions in Europe, where the labor movement originated. This departure reflected the very different conditions of Jewish workers in Palestine and the leading role of the Zionist-Socialist parties in the Zionist movement. The Jewish workers in Palestine, who were new immigrants, accepted and embraced these policies. They understood that such policies helped them obtain jobs. They also agreed with the priority of national over socialist goals, since they understood the importance of the great national project in which they took part.[38]

However, the policies of the labor movement created an inevitable tension between Zionism, which won precedence, and Socialism, which remained behind. Zeev Sternhell (1998) wrote about this tension: "Socialism was soon a tool for achieving national goals and not a means of creating a new social order." Sternhell is more critical than I am and claims that "the inability of the labor movement and its failure to build an egalitarian society stemmed not from objective constraints but from a conscious ideological decision." The departure of the labor movement from the Socialist tradition began early in the 1920s, when the Histadrut was established, but it

deepened over time. When the labor movement gained control over the Jewish Agency in 1931 and solidified its leadership of the Zionist movement, David Ben-Gurion published a book titled *From Class to Nation*, which says it all.[39] After 1948, the process deepened when Ben-Gurion formed a new ideology, "Statism" (Mamlachtiut).[40] It called to grant superiority to the new institutions of the state, over sectoral loyalties. This ideology weakened the labor movement significantly. At the Eighth Conference of the Histadrut in 1956, David Ben-Gurion said: "The State is a more efficient, powerful and comprehensive instrument than the Histadrut."[41]

As argued above, the choice of the labor movement to give priority to the national interest was unavoidable. It was necessary for the success of the Zionist project and for the absorption of immigrants, especially workers. However, the labor movement paid a dear price for this choice later. Already in the 1960s, Viggo Kampmann, former prime minister of Denmark, noticed after a visit to Israel:

> What the Histadrut does and what the State does is not Socialism. This is capitalism of the government and capitalism of the trade unions. You created socialist societies in agriculture, but not in industry. It does not matter if the employer is the state, the Histadrut, or a private employer. The relations between the worker and the employer are similar in all cases, and the wage is similar. There is no ideological content in enterprises of the state or of the trade unions, because they have to compete with the private industry.[42]

The price that the labor movement paid later was much harsher. It led the national revolution and built the state, but once this mission was accomplished, it found itself empty. It could not become a regular Social Democrat party, not only because it abandoned much of this ideology long ago but also because of the profound social changes in the country. The mass immigration in the first years of the state pushed up much of the previous regular members of the labor movement to positions of managers, directors, and professionals. Their previous working positions were taken by the new immigrants, who came mainly from Arab countries. These new immigrants accepted initially the hegemony of the labor movement, but soon realized that its Socialist rhetoric was empty. The Histadrut marched annually on May Day, but it was one of the largest employers in the country. Thus, the ideological tension became a socioeconomic tension between the labor movement and the new working class. Furthermore, the tension was also partly ethnic, between the veteran East Europeans and the immigrants from Arab countries.[43]

These tensions between the Socialist rhetoric and the capitalist practice, and between the new working class and a party that consisted increasingly of a new elite of managers and executives, together with the tension between East Europeans and new immigrants from Arab countries, gradually eroded the support of the labor party. Not only the new working class abandoned it, but later the managers and the executives also abandoned it, as they no longer needed the socialist rhetoric. They preferred to support centrist neoliberal parties directly. That led to a long process of decline, until recently, when the leading party of the past won only three to seven seats out of 120 in recent election rounds and almost faded away.

ASHKENAZI VS. MIZRAHI JEWS

Of the 483,000 immigrants who arrived in Palestine during the Mandatory period, only 45,000 came from Asia and Africa, while 90 percent emigrated from Europe. After 1948, the picture reversed. In the first 20 years of the State of Israel, 1948–1968, 53 percent of the immigrants

came from Asia and Africa, namely, from Muslim countries, like the Arab countries, Iran and Turkey.[44] This had significant effects not only on Israeli demography but also on its economy and society. Immigration led to significant gaps between European (or Ashkenazi) immigrants and Mizrahi immigrants from Muslim countries. Some gaps carried over to subsequent generations as well. Many have claimed that some of these gaps were due to discrimination against Mizrahi Jews, and this is a major issue in Israeli discourse. While we discuss these gaps economically later in the book, here we describe some of their institutional and cultural aspects.

One possible explanation for these gaps is that the institutions from the Mandatory period created automatic preference for Ashkenazi over Mizrahi immigrants. The people who operated these institutions were mainly East Europeans, and it is possible that when the great immigration arrived in the early years of the state, they treated the European immigrants preferentially, since they shared with them memories, acquaintances, language, and culture.

The issue of ethnic discrimination is always high on Israel's public agenda. Nonetheless, there are not many historical studies on it. Recently, a film on the history of Development Towns in Israel has made public some documents of the Jewish Agency from the 1950s and 1960s, which were previously confidential.[45] The documents reveal that the Jewish Agency sent immigrants from North Africa directly to the new Development Towns in the periphery, while it sent immigrants who arrived from Poland at the same time to the center. Another indication for institutional discrimination is from the 1970s, when the Likud began to accumulate political power, first in local and then in the central government. Many Mizrahi Jews reached positions of power and influence through the Likud party, which indicates that they have previously faced serious barriers to social and political upward mobility.

The immigrants from the Arab countries not only faced institutions run by people who were alien to them and even discriminated against them, but they also confronted harsh cultural barriers. The Jews in Arab countries, especially those who lived in large coastal cities, were exposed to Western culture, French in North Africa, Italian in Libya, English in Iraq, and more. However, they were closely connected to the Arab culture in their home countries as well. In general, Jews fared better overall in Islamic than in Christian countries. While the Jews in the latter suffered from severe persecutions, Jews were safer in Muslim countries, although life was far from perfect for them. They were subject to various legal restrictions, some of which were abolished during the nineteenth century, but they enjoyed basic security and were much more integrated in society in general than they were in Christian countries.[46]

The establishment of the State of Israel in 1948 put the Jews in Arab countries in a terrible dilemma between their people and their neighbors. Most chose their Jewish brothers and sisters and immigrated to Israel.[47] When these immigrants arrived in Israel in its early years, a significant part of their culture was Arab, as they spoke Arabic, read Arabic, and listened to Arab music. They came to a country that had just finished a bloody war with the Arab world, in which Arabs were the enemy across the border. Furthermore, following the victory in the war of Independence, Israelis developed contempt toward Arabs. Some of it spilled over to Jews from the Arab countries, whom they viewed as primitive and of low culture. In the first decades, Arab culture was taboo in Israel. To integrate into the new country, Jews from Arab countries had to give up large part of their culture. This is always difficult, and when it comes with the general difficulties of adapting to a new country, especially for immigrants who face condescension, the absorption process becomes much harder.

Overall, the process of integration of the Jews from the Islamic countries to Israel has been a

great success story. The immigrants and their children occupy many important positions in the country, and the economic gaps between them and the Jews of European origin have declined significantly.[48] However, the gaps have not yet fully disappeared, not even at the second generation, born in Israel, as chapter 13 of this book shows. Furthermore, the feelings of exclusion and discrimination still linger and have a large effect on the discourse in Israel, both in standard and in social media.

Success and Its Costs

The historical background in this chapter is actually one of the great success stories of the twentieth century: Zionism. The Jewish national movement was a reaction to the great Jewish distress in Eastern Europe, and it succeeded in directing a large part of the Jewish immigration to Palestine, a poor and dangerous country at the time. This movement built flourishing agriculture by immigrants who had no previous farming experience in their countries of origin. This enabled the movement to get control over vast areas of the country, which was vital to its success. The movement built a rich system of political, social, and economic institutions that amplified the power of the small community. Without prior military experience, it succeeded in coping with the Arab military threat and in establishing a state during a bloody war, and later even became a regional power. Another important move was bringing in the Jews from the Arab countries in a short period. This move increased the population of the young state and helped solidify its existence in the Middle East. The Peace Agreement with Egypt also contributed significantly to the security and the economy of Israel.

It is impossible to understand the Israeli economy without considering the background of the Zionist project. As Don Patinkin, the founder of academic economics in Israel, wrote in the introduction to his book on the first decade of the Israeli economy: “The ingathering of the exiles. This is the policy and the reality that has left its deepest mark on every aspect of Israeli society.”[49]

This book shows that just as Zionism has been a unique success story, so is the Israeli economy. However, the success of Zionism exacted a heavy price from many, primarily the Palestinian people, who left a large part of their country and did not reach independence until this day. The Jews from the Arab countries also paid a price during the process. These costs keep hurting the progress of Israel to this day. The Israeli-Arab conflict has not yet been resolved, and the inner ethnic gaps are still hurting. This book shows that the same issues for which Zionism failed—the Israeli-Arab conflict and the large gaps within Israeli society—challenge the Israeli economy as well.

1. See Fromkin (1989).
2. The British authorities called the country Palestine in English, while using the term “Palestine Eretz Yisrael” in Hebrew. Jews always called the country “Eretz-Yisrael,” meaning the land of Israel.
3. Resolution 181. See https://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/181(II).
4. See Sela (2002).
5. “Yishuv” is the Hebrew name for the Jewish community in the country before the establishment of Israel. The “Old Yishuv” were those who had lived in the country before 1882, while the “New Yishuv” were the new immigrants, who came after 1882.
6. Much of the information on immigration in this chapter is from Bein (1976).
7. See Gat (1963).
8. See Dashefsky and Sheskin (2019), p. 9.

9. See Bein (1976).
10. See Pa'il (1979).
11. See Morris (1987) for a thorough analysis of the refugee problem.
12. The description of waves of immigrations is from Bein (1976), while the numbers of immigrants in each wave are from Central Bureau of Statistics (2019), table 2.53.
13. Aliyah means "ascent" in Hebrew, a common term for Jewish immigration to Israel. Before the establishment of Israel, each such immigration wave, or Aliya, had a "serial number."
14. Moshavot were settlements of farmers, who worked the land on a private basis.
15. See Cleveland and Bunton (2016).
16. A moshav is an agricultural settlement, which is partly collective.
17. See United States Holocaust Memorial Museum (2020).
18. See Alroey (2014), p. 17, for this observation.
19. See Trigano (2018) for descriptions of these migrations.
20. For more on this immigration, see Lissak (1999).
21. See Trigano (2018).
22. Actually, Israel reached an agreement with the United States that the latter would limit entry of ex-Soviet Jews, to encourage them to go to Israel. Indeed, in 1989 the United States stopped granting Soviet Jews unconditional refugee status. See Y. Cohen, Haberfeld, and Kogan (2011).
23. See Cleveland and Bunton (2016).
24. See Morris (1999).
25. In the famous McMahon-Hussein correspondence. See Kedouri (2014) for its effect on the conflict. See also Segev (2000).
26. See Porath (1974).
27. See Segev (2000) for more on the Mandatory period.
28. Further information on the history of the conflict is in Tessler (2009) and Morris (1999).
29. "Events" (Me'oraot) is the Israeli term for clashes during the Mandatory period. I try to also give the Palestinian term whenever I can. However, this book focuses mainly on the effects of the conflict on Israel.
30. A similar observation appears in Gelvin (2006).
31. For a recent book on the importance of institutions for development and growth, see Acemoglu and Robinson (2012).
32. For a recent survey of Israeli politics, see Galnoor and Blander (2018).
33. See Yiftachel (2006).
34. Kupat Holim is a health fund, which provides both health insurance and health care.
35. See Ben-Porat (2011), p. 74.
36. See Galnoor and Brander (2018).
37. Ben-Gurion (1931), p. 169 (my translation).
38. Only a small minority of the workers rejected these deviations from classical socialism. They usually joined the Communist Party of Palestine, the PKP, and some even immigrated to the Soviet Union.
39. The book is Ben-Gurion (1933).
40. See Galnoor and Brander (2018). Ben-Porat (2011), chapter 5, contains a thorough analysis of this ideology and its role in the shift toward capitalism in Israel.
41. The Ben-Yeuda Project, https://benyehuda.org/read/19057, accessed on April 5, 2021.
42. Kampmann (1968), p. 143 (my translation).
43. For a thorough analysis of these tensions, see Grinberg (1993).
44. See Central Bureau of Statistics (2019), table 2.53. The figures include Jewish immigrants from South Africa as well, who were of East European origin, but their number was negligible.
45. The film, released in 2017, is "Salah, This Is the Land of Israel" by David Edri, Doron Galezer, and Ruth Yovel.
46. See M. Cohen (1994), which is a comprehensive historical comparison of Jews under Islam and under Christianity. Recently, some, like Trigano (2018), claim that Jews suffered from strong anti-Semitism in Islamic and especially in Arab countries. However, even the articles in Trigano (2018) agree that the deterioration in relations between Arab and Jews was a result of the Colonial occupation of the Middle East after World War I and especially after the intensification of the Israeli-Arab conflict in 1948. Even these articles confirm that Jews "held central positions in all areas, social, economic and cultural" (Trigano 2018, p. 38).
47. See Trigano (2018) for detailed descriptions of these immigrations.
48. See Dahan (2013).
49. Patinkin (1967), p. 19.

PART I

The Israeli Growth Miracle

As chapter 1 shows, mass immigration of Jews to the country began in 1924. From 1924 to 1947, Jewish population grew sevenfold. From 1948 to the present, the population of Israel grew more than tenfold. Such a rapid increase in population required an increase in output and incomes. Otherwise, the immigrants would have been condemned to starvation and extinction. Indeed, Israel experienced a very rapid economic growth. Throughout this period, output has grown by a factor of 1,700, much faster than the population. Not only did the immigrants not starve, their average income and the average standard of living increased 24-fold during this period. This part of the book describes how this growth happened and explains what made it possible.

Chapter 2 describes the dynamics of Israeli economic growth and compares it to that of other countries. Its main finding is that Israel experienced rapid economic growth in its early years, which actually had already started at the time of the British Mandate in Palestine. The 50 years of rapid economic growth took place from 1922 until 1972. From 1973 on, the Israeli economy has grown at a lower rate that is similar to the rate of growth of other advanced countries. Hence, this chapter finds that the early years were a period of "catching up" with the advanced economies. Chapter 2 also compares Israel to its neighboring countries and shows that Israel developed in an area of less-developed countries.

Chapter 3 explains the economic growth throughout the period by using the basic economic framework of the "aggregate production function." It finds that growth in total factor productivity explains all economic growth in Israel. Productivity affects growth directly (by increasing output), and affects it indirectly, by raising profitability, which induces investment, which increases capital and through it increases output. The chapter shows that the combined two effects account for all economic growth. Chapter 3 then examines two main components of productivity. The first is human capital, which increases by the expansion of education. The second component is technical change, namely, adoption of technologies. Such adoption requires purchasing many investment goods, such as tractors, ships, airplanes, and cars. The chapter then examines how Israel was able to finance such large purchases.

Chapter 4 addresses a few additional issues related to Israeli economic growth. It focuses on two issues that seem to contradict each other. The first is the rise of the high-tech sector over the past 30 years, which is a huge success story. The second issue is the low labor productivity in Israel relative to other advanced countries. Chapter 4 examines these two issues and tries to assess and explain them. Part I ends with a brief discussion of the role of policy in the success of Israeli economic growth.

2

Catching Up

THE RAPID GROWTH OF 1922–1972

What Is Economic Growth and How Do We Measure It?

This chapter describes economic growth in Israel and compares it to growth in other countries. The main measure of economic growth is the growth rate of real gross domestic product (GDP) per capita or per worker. We often use the term "output" instead of "GDP." GDP is the sum of all final goods and services produced in a country during a year, minus the imported intermediate goods. Goods and services produced by the business sector enter GDP through their market prices, while goods and services produced by the public sector enter GDP through their cost of production. GDP does not include homemaking, like childcare, cooking, laundry, cleaning, and driving if done by household members.

The calculation of GDP in Israel today involves a special problem of territory. Israel's GDP includes production by Jews who live in the occupied territories (in settlements), but it does not include production by Palestinians who live in these same territories. The reason is that Israeli statistics do not include the occupied territories (except for annexed East Jerusalem and the Golan Heights), but they do include the settlers who live in these territories. This rule does not conform to the international standards of statistics, which require that the population should include all residents and only residents in the territory. In other words, there should be a fit between population and territory. Interestingly, this problem delayed the acceptance of Israel into the Organisation for Economic Co-operation and Development (OECD) for many years, until the OECD caved in to pressure from the United States and accepted Israel in 2010.

Israel's GDP in 2018 was 1,330.6 billion New Israeli Shekels (NIS). As the average population in Israel during 2018 was 8.883 million people, GDP per capita in that year was 149,797 NIS.[1] Since the average exchange rate in 2018 was 3.5949 NIS to 1 US dollar, this output (GDP) per capita was worth $41,699.[2] In 2018, US output per capita was $62,996 and hence the income ratio between the two countries was 0.662.[3] Using a ranking of countries by GDP per capita in current US dollars by the World Bank, Israel was in the fortieth place in 2018.[4] This ranking clearly shows that the country has joined the elite group of the most advanced economies.[5]

To measure economic growth, it is not enough to look at current GDP or GDP per capita: We

need to examine how output evolves over time. This raises the issue of prices. As GDP is calculated using market prices, which change over time, we might get the wrong impression about growth. For example, the nominal growth rate in Israel in 1982 was 130 percent, but this was not a result of high growth, but instead of very high inflation. The growth rate of real GDP in that year was only 1.4 percent. This is why economists use data on the "real" output that are independent of the price levels, which measure GDP in "constant prices" of a specific year instead of nominal GDP in "current prices." Thus, Israeli GDP in 2105 was 1,165.33 billion NIS, and in 2018 it was 1,298.23 billion NIS in 2015 prices. Hence, in these 3 years, real GDP increased by 11.4 percent, which is an annual average growth of 3.7 percent. GDP per capita in 2015 was 139,108 NIS, while in 2018 it was 146,181 NIS in 2015 prices. Hence, GDP per capita increased in those 3 years by 5.1 percent, which is an average annual growth rate of 1.67 percent.[6]

As when using real data to neutralize changes in prices over time, economists, who compare GDP across countries, have to account for differences in prices across countries. One way to do this is to use the exchange rate, as in the above comparison between Israel and the United States. However, countries differ in prices and in their typical consumption baskets as well. To overcome these differences, economists have constructed measures of GDP that take into account differences in prices across countries. These are purchasing-power-parity (PPP) adjusted data. Such data have been available since the late 1980s. The best-known such database is the Penn World Tables (PWT), first constructed by Robert Summers, Irving Kravis, and Alan Heston of the University of Pennsylvania. The World Bank and the International Monetary Fund (IMF) also have similar databases. A nice example of PPP data appears annually in *The Economist* news magazine. It compares the price of a Big Mac, which is a uniform product, across different countries. Comparing GDP per capita in PPP data, Israel is ranked number 31 in the world.

As explained above, to measure output per capita, we divide GDP by the average size of the population during the year. We use the average population and not end-of-year population, because GDP measures production during the whole year. We also measure GDP per worker, which is called "labor productivity," by dividing GDP by the average number of workers during the year (or if data are available, by the total hours worked during the year). In 2018, the average size of the Israeli labor force was 3.905 million workers, which was 44 percent of the population.[7] Hence, GDP per worker in 2018 was 340,747 NIS. Although GDP per worker is much higher than GDP per capita, we show below that they tend to move together over time, so both give a good indication of economic growth.

The rate of economic growth is measured annually as the percentage change of real GDP, or of real GDP per capita, or of real GDP per worker. Nevertheless, we should not confuse the annual growth rate with the phenomenon called "economic growth," which is long-run growth. Economists distinguish between the trend of economic growth and the fluctuations around this trend, which they call "business cycles." For example, in 2010 the rate of growth of GDP in Israel was very high, 5.5 percent, but it reflected the recovery from the recession of 2009. Later, the rate of growth returned to the long-run average of 3.5 percent. Hence, to separate the phenomenon of economic growth from that of business cycles, one needs to look at average growth rates over many years.

Global Economic Growth

Israel's economic growth is part of the larger phenomenon of global economic growth. Hence, before we turn to Israel, let us consider some basic facts on economic growth around the world and in different regions of the world. The facts are from Maddison (2001, 2005). Angus Maddison was an economic historian who specialized in estimates of past economic growth. He built an exhaustive data set on long-run historical growth, which is PPP adjusted (like the PWT) and measures GDP in many countries over long periods in terms of 1990 dollars.

The GDP data from the past 1,000 years show that accelerated economic growth is a relatively new phenomenon, which began only in the 1820s with the spread of the Industrial Revolution. For about 800 years, from 1000 to 1820, per capita global GDP grew by only 50 percent, while in less than 200 years, from 1820 to 2001, per capita GDP grew by nine times. Population growth data support this conclusion as well. In the 800 years from 1000 to 1820, global population quadrupled, from 250 million to 1 billion. Between 1820 and 2001, the world's population grew from 1 billion to 6 billion. This increase is mainly due to prolonging life expectancy, which rose from 24 years at birth in 1000 to only 26 years in 1820, but then reached 66 years in 2001. Longer life expectancy is a direct result of economic growth, through improvements in medicine, sanitation, and quality of food.

The data on economic growth across countries are as fascinating as the data on global growth. Maddison looks at seven regions that reflect the world of 1820: Western Europe, Western offshoots (United States, Canada, Australia, and New Zealand), Japan, Asia without Japan, Latin America, Eastern Europe, and Africa. He shows that 1,000 years ago, income was fairly equal across all regions. The gaps between regions grew during the second millennium but were still relatively small in 1820. Income per capita in Western Europe was three times higher than in Africa, and that was the largest gap. Since 1820, West European countries, Western offshoots, and Japan have grown rapidly, while the other regions grew more slowly, so the gaps between them and the leaders increased. In 2001, per capita GDP in the United States was 18 times higher than in Africa. These large gaps of income across countries are still a serious puzzle to growth economists. We also learn from the Maddison data that since 1870, shortly after the US Civil War, the United States became the global growth leader, with GDP per capita growing at a stable rate of 1.8 percent annually.[8]

TABLE 2.1. Average annual growth rates of population, GDP, and per capita GDP in Israel, 1922–2018 (percent)

Period	1922–1947	1950–1970	1970–1990	1990–2000	2000–2010	2010–2018
Population	8.3	4.4	2.3	3.0	1.9	1.9
GDP	13.2	9.8	4.5	5.6	3.2	3.6
GDP per capita	4.5	5.2	2.2	2.5	1.2	1.6

Source: Data for the Mandatory period are from Metzer (1998, tables A.1, A.20). For the period after 1950, data are from Central Bureau of Statistics (2019, tables 2.1, 11.1, and 11.2). Output during the Mandatory period is net domestic product, while from 1950 on it is GDP. The averages of the growth rates are geometric.

Economic Growth in Israel over the Years

This section describes the main dynamics of economic growth in Israel. The data begin in 1922, when the British Mandate began. However, here we focus mainly on the years of the State of Israel. Note that the data from the Mandatory period are on growth of the Jewish Community

(the Yishuv), whereas from 1950 on, the data are on growth in the State of Israel and include Jews and Arabs. Table 2.1 presents average growth rates of population, GDP, and GDP per capita in sub-periods after 1922.

Table 2.1 shows that despite the rapid growth of the population, GDP has grown at a much higher rate, both before and after the establishment of the state. In the quarter century of the British Mandate, the Jewish population grew by 7.4 times, and their output grew by a factor of 22. Output per capita grew during the Mandatory period by a factor of 3.[9] In the years 1948–1949, the country experienced an intense war, and data on output are missing. However, in the 69 years from 1950 to 2018, the population in Israel grew by a factor of 7, while GDP grew by a factor of 48. This rapid growth enabled a sharp rise of per capita GDP, by a factor of 7. The economic growth in Israel was therefore impressive and enabled the country not only to absorb all the immigrants, but also to significantly raise their standards of living. Table 2.1 also shows that growth changed over time from rapid growth until the end of the 1960s to slower growth since the 1970s. We show below that the turning point occurred in 1973. Hence, the period of rapid growth was during the 50 years 1922–1972. This was the Israeli "Growth Miracle." In later years, Israel experienced a more typical rate of economic growth.

Figure 2.1 presents per capita GDP for 1950–2018. The figure shows real GDP in 2015 prices in NIS. The graph uses a logarithmic scale, so that the slope of the curve is proportional to the rate of growth. It is therefore obvious from figure 2.1 that in 1973, the slope of the curve changes significantly, so we can conclude that long-term growth rates decreased after 1973. The annual average growth rate of GDP per capita from 1950 to 1972 was 5.4 percent, while the annual average rate of growth of per capita GDP in the years 1973–2018 was 1.7 percent.

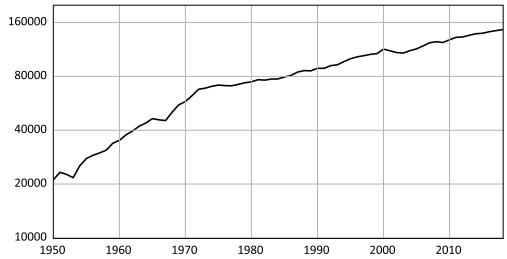

FIGURE 2.1. GDP per capita in 2015 prices in Israel, 1950–2018.
Data are from Central Bureau of Statistics (2019, tables 2.1, 11.1, and 11.2). The logarithmic scale is 2.

Figure 2.1 leads to three main conclusions. First, GDP per capita has increased significantly over time. Second, growth rates fluctuated around the long-term trend. For example, in 1951–1952, in 1965–1966, and in 2001–2003, GDP per capita declined relative to the trend. These are not random years, of course, but are significant recessions that the Israeli economy experienced. Chapter 7 discusses these fluctuations around the growth trend, called "business cycles." The third conclusion from figure 2.1 is that growth in Israel went through two main phases: rapid growth until 1972 and slower growth thereafter. Note that the average annual rate of growth of GDP per capita after 1972, 1.7 percent, is similar to the rates in most developed economies. Hence, what is unique about Israel's economic growth is the fast growth in the 50-year period 1922–1972. I therefore claim that it was a period of "catching up" with the advanced economies. This claim receives more support in the next section.

Comparing Economic Growth in Israel to Growth in Other Countries

Most developed countries began to grow more rapidly in the nineteenth century. Israel does not belong to this group of pioneers; it joined the race only during the first half of the twentieth century. However, despite beginning to grow relatively late, Israel quickly converged to the levels of income of the developed world. Within 50 years, from 1922 to 1972, Israel transformed from a third world country to a developed country, among the 30 countries with the highest per capita GDP in the world.

To illustrate this phenomenal achievement, compare GDP per capita in Israel to that of the United States, using PPP data from PWT.[10] In 1922 per capita GDP in the Jewish Yishuv was 17 percent of per capita GDP in the United States. In 1950 per capita GDP in Israel was 35 percent of that in the United States; and in 1972 it was 62 percent. Since 1972, Israel has remained at the same level relative to the United States. In 2018 per capita GDP in Israel was 66 percent of that in the United States. In other words, until 1972, Israel grew at an accelerated pace and greatly improved its international standing. Since 1972, Israel's growth rate has slowed, but it is still growing at a similar rate to that of the global growth frontier.

A similar picture emerges from figure 2.2, which describes per capita GDP in Israel and the United States from 1950 to 2017, in 2011 dollars. The figure uses a logarithmic scale, so that the vertical distance between the curves is an indication to the ratio of GDP per capita in the two countries. The continuous curve describes Israel, while the dotted curve describes the United States. Figure 2.2 shows that until 1972, Israel grew much faster than did the United States, but since then the two curves have been nearly parallel, so that the two countries have been growing at a similar rate.

After 1973, many Israeli economists were concerned about the decline in Israel's growth rates, and some even called those years "the lost decade of the Israeli economy." However, a longer historical perspective, of 45 years later, shows that the decline in growth was not an economic failure but the inevitable end of the fast catching up. Figure 2.2 shows that if Israel continued to grow at its fast rate prior to 1972, it would have passed the United States in about 1982. There are few developed countries with higher GDP per capita than the United States, but none grows faster. Hence, Israel had to slow down its growth at some time. It happened in 1973. In chapter 3, we examine a possible explanation of why it happened then and not before or after. Many developed countries, like Germany, Italy, France, and Japan went through similar periods of catching up after World War II. In Israel, it took more time, as the country began from a lower point.

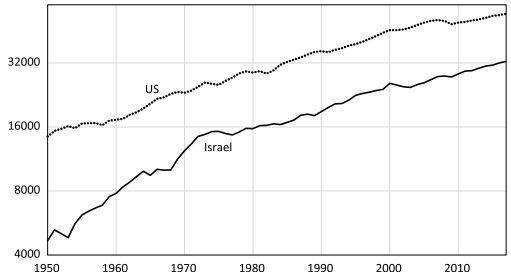

FIGURE 2.2. GDP per capita of Israel and the United States in 2011 dollars, 1950–2017.
Data are from Feenstra, Inklaar, and Timmer (2015). More specifically, PWT 9.1, using the series "rgdpna" for real GDP. The logarithmic scale is 2.

Figure 2.3 presents another international comparison of Israel, this time with its neighbors in the Middle East and North Africa. Many economists believe that economic growth depends strongly on geography. Figure 2.3 compares growth in Israel with three regional countries, Egypt, Jordan, and Saudi Arabia. These are three representative countries, as Egypt is in North Africa, Jordan in the Middle East, and Saudi Arabia is one of the Gulf countries.

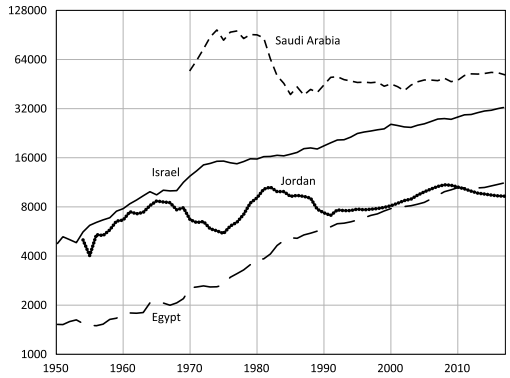

FIGURE 2.3. GDP per capita of Israel, Egypt, Jordan, and Saudi Arabia, 1950–2017.
Data from Feenstra, Inklaar, and Timmer (2015), PWT 9.1, using the series "rgdpna" for real GDP. The logarithmic scale is 2.

Figure 2.3 shows that economic growth in Israel has been very different from its neighbors. Per capita GDP in Israel has been much higher than in Egypt and Jordan throughout the period. Jordan has grown much slower than Israel. In 1954 its GDP per capita was 90 percent of that in Israel, while in 2017 it was only 29 percent. Egypt grew at an average rate similar to Israel, but it has remained much poorer. In 1950 its GDP per capita was 32 percent of that in Israel, and in 2017 it was 34 percent. Saudi Arabia has higher income than Israel does, but this is due to oil production. Its output has been stagnant since the 1970s and now the country's GDP per capita is much closer to that of Israel. This is typical of oil-producing countries, and countries with natural resources in general, which suffer from low growth. Economists call this phenomenon the "Resource Curse."

Structural Changes

Economic growth in advanced countries came with many additional changes, such as urbanization, demographic transition, upward mobility by many from the lower classes to the middle class (mainly through education), and changes in the economic sectoral structure. This structural change was mainly a transition from agriculture to industry, and later from industry to services, so that ultimately, agriculture declined and services grew. Table 2.2 presents the composition of business-sector GDP in Israel to its main sectors.

Table 2.2 shows that the share of agriculture declined sharply over the years, industry increased but then declined again, while services increased throughout the period. Hence, Israel followed the same structural changes as other developed countries. Interestingly, in the early days of the state, the government planned to increase agriculture to 25 percent of GDP, to solidify the new, long borders by settling along them. It also wished to have self-sufficient agriculture, as Israel had no contact with its neighbors and could trade only with distant countries by sea or by air, which was problematic for trade in agricultural goods. However, economic forces were stronger than any plan, and agriculture declined relative to GDP.

TABLE 2.2. Main sectors of business output, selected years (percent)

Sector	1955	1960	1970	1980	1990	2000	2010	2018
Agriculture	14.2	14.4	7.9	6.5	4.5	2.5	2.4	1.8
Industry (including mining)	26.0	28.4	30.0	26.6	28.5	26.5	22.6	19.7
Construction, water and electricity	10.7	10.8	14.3	14.4	11.0	10.1	10.3	11.4
Services	49.1	46.4	47.8	52.5	56.0	64.6	64.7	68.1

Source: Data are from Central Bureau of Statistics (1958, table 6.2; 1962, table 6.10; 1972, table 6.8; 1982, table 6.9; 1991, table 6.7; 2001, table 18.2; 2019, table 15.1).

Changes occurred in the main sectors as well. Citrus, a leading agricultural export in the early days, declined strongly. Table 2.3 describes the composition of industry over the years. Note that it does not include the diamond industry, due to lack of data. The diamond industry reports its income confidentially to the Minister of Finance only, according to an agreement from the Mandatory period between the government and the Diamond Exchange.

Table 2.3 shows that there have been dramatic changes in the composition of industrial production over the years. The food industry declined, as the share of food in modern consumer baskets has declined everywhere. The decline of the textile industry was much more dramatic. It had been a large industry since the 1920s, as it was a specialization of Polish Jewry. It further increased after 1948, as it enabled quick employment for the many immigrants. Later, as Israel developed, wages increased, and many textile companies could not cope with competition from poorer countries, and such companies quit or moved abroad. Instead of textile and food, Israel experienced growth in its electronic industries, related to the rise of high-tech. Hence, growth greatly increased knowledge-intensive industries at the expense of low-tech industries.

TABLE 2.3. Industrial sectors in Israel, selected years (percent)

Sector	1955	1960	1970	1980	1990	2000	2010	2016
Mining	2.9	2.9	2.6	3.6	3.2	2.3	4.5	7.7
Food, beverages, and tobacco	18.4	20.0	22.2	19.8	12.5	11.3	10.7	11.6
Textile, garments, and footwear	19.9	13.2	16.0	11.4	8.6	4.6	1.9	1.9
Wood and paper	12.8	12.3	9.0	7.9	9.1	8.3	5.3	5.6
Chemicals	19.9	23.4	16.7	20.3	19.5	16.8	28.2	24.7
Metals and machines	14.8	20.9	18.3	18.9	16.1	14.4	13.4	18.2
Electronics	3.3	5.2	7.6	9.7	21.1	35.9	27.4	25.4
Transportation	3.9	9.8	6.5	6.7	7.7	5.3	5.9	4.9

Source: Data are from Central Bureau of Statistics (1958, table 9.13; 1963, table 9.4; 1973, table 14.6; 1983, table 14.12; 1993, table 14.11; 2003, table 20.11; 2013, table 20.13; 2019, table 16.13).

Growth of Factors of Production

Economic growth is the long-run increase of output (that is, of GDP). However, production requires labor, capital, and land. These are what we call the main “factors of production.” When output increases, these factors of production increase as well, mainly labor and capital. This section examines their growth in Israel. First, let me explain briefly what these factors of production are. Labor is the human input to production during a year. We measure it by number of work-years, namely, number of persons who worked in a year, or number of workdays, or number of work hours per year, depending on the quality of the data we have. Capital consists of

the inputs to production, which are themselves products, but not intermediate goods. These inputs consist of tools, machines, furniture, vehicles, or equipment in general, and structures. Note that structures comprise of both land and capital, where land is the area on which the buildings stand, while the buildings are capital. Land is a factor of production, which is part of structures and of infrastructure (such as roads, rails, ports, and bridges), but its main use is in agriculture.

GROWTH OF LABOR

As a country that absorbs large numbers of immigrants, Israel had a rapidly growing population, as explained in chapter 1. As population increases, labor should increase as well, if there is some stable ratio between population and the labor force. We next examine this ratio in three main steps. First, how large was the working-age group; second, how many in the working-age group actually looked for work; and third, how many of them found jobs. The most common definition of the working age is 15 years old and older, while sometimes it is 15–64 years old. During the Mandatory period, the age group 15–64 in the Yishuv was very large, 67 percent, since many of the immigrants were young pioneers. After 1948, the rate dropped to 62 percent due to arrival of entire families from Arab countries. Table 2.4 presents the age composition since 1955.

TABLE 2.4. Age composition of population in Israel, selected years (percent)

Year	1955	1960	1970	1980	1990	2000	2010	2018
Age 0–14 years	34.8	36.0	33.0	33.3	31.3	28.6	28.0	28.2
Age 15–65 years	60.4	59.1	59.8	58.1	59.6	61.6	62.1	60.1
Age 65+ years	4.8	4.9	6.8	8.6	9.1	9.8	9.9	11.7

Source: Data are from Central Bureau of Statistics (1956, tables 2.11, 2.12; 1961, table 2.11; 1971, table 2.16; 1981, table 2.15; 1991, table 2.10; 2011b, table 2.10; 2019, table 2.3).

Table 2.4 shows that Israel is a very young country. Although the age group of children (0–14 years) has declined, it is still very large today. For comparison, in the OECD countries, this age group was 18.6 percent of the population in 2010. The group of older people (more than 65 years old) has increased over time and actually doubled, but it is still comparatively small. In the OECD countries, this age group was 14.7 percent in 2010. In Japan, the elderly population was greater than 25 percent in 2013; and in Germany, Italy, Finland, Greece, and Portugal, this group made up about 20 percent of the population. The group of 15–65-year-olds in Israel is relatively small, 6 percentage points below the OECD average. Israel is a younger country than other developed countries due to its high fertility rate. Chapter 4 discusses this high fertility rate, as it has significant economic consequences.

Not all people of working age seek work. Some stay at home to take care of the family (mainly women), some are students, and some retire early. The share of those who choose to work from the age group 15 years and older is usually called “the labor market rate of participation.” These are people who work or search for work. Table 2.5 presents the participation rates over the years for men, women, and the entire population. Note that in 2012, the Central Bureau of Statistics changed the measurement of workers and added military conscripts to the participation rate. The rates in parenthesis for 2018 are corrections, to conform that year’s data to the previous measurements.

TABLE 2.5. Participation rates in age group 15 years and older, selected years (percent)

Year	1955	1960	1970	1980	1990	2000	2010	2018
Participation rate, men	80.1	78.1	69.2	63.7	62.3	60.8	62.2	68.2 (61.2)
Participation rate, women	26.5	27.3	29.3	35.7	41.1	48.2	52.7	59.8 (54.3)
Participation rate, total	53.6	52.9	49.3	49.5	51.5	54.3	57.3	63.9 (57.9)

Source: Data are from Central Bureau of Statistics (2019, table 9.1). The corrections for 2018 are by the author.

TABLE 2.6. Rates of unemployment and of employment in Israel, selected years (percent)

Year	1955	1960	1970	1980	1990	2000	2010	2018
Unemployment rate	7.2	4.6	3.8	4.8	9.6	8.8	6.6	4.0
Employment rate	32.4	32.3	31.8	31.4	32.0	35.3	38.5	44.0 (39.2)

Source: Data are from Central Bureau of Statistics (2019, table 9.1). The corrections for 2018 are by the author.

Table 2.5 shows that the participation rate of men has declined from 80 to about 60 percent. This is a result of the expansion of education in high schools, universities, and colleges. The table also shows that the participation rate of women increased significantly during the period and more than doubled. It is even more impressive when one considers the rise of women's education, which has surpassed that of men. Women's participation rate reflects their leaving their traditional role as homemakers and their entry into the labor market. Interestingly, the two trends—of falling participation rates for men and rising rates for women—have left the total rate of participation quite stable between 50 and 57 percent. The sharp decline in the rate of participation of men between 1960 and 1970 is due to the large expansion of the army after 1967.

To find the number of workers, one needs to subtract the unemployed from the supply of labor. Table 2.6 presents the rates of unemployment for the participating population and the rate of employment for the total population. The average rate of unemployment during the whole period was rather low, 6.5 percent. The rate of employment in 2018 includes the official figure and a correction (in parentheses) to make it comparable to that of previous years.

Table 2.6 shows that the ratio of employment to the size of the population in Israel was stable for most of the years at 32 percent, and only in the past two decades has it begun to rise to around 40 percent. Part of this recent rise is demographic, due to decline in the share of children in the population, and part is due to increases in the rate of labor force participation.

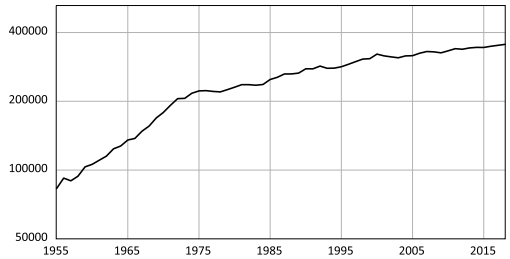

FIGURE 2.4. GDP per worker in 2015 prices in Israel, 1955–2018.
Data are from Central Bureau of Statistics (2019, tables 9.1, 11.1, and 11.2). The logarithmic scale is 2. I made corrections for number of workers after 2012, for comparison with previous years, as explained in the text near table 2.5.

If the rate of employment in the economy was quite stable over time, it means that labor input increased at approximately the same rate as the population. Hence, the immigration waves

increased the input of labor in production over time. From 1955 to 2018 the population in Israel increased by a factor of 5, and employment increased by a factor of 6. It follows that GDP per worker, called "labor productivity," and GDP per capita have grown at similar rates. If workers made up one-third of the population over most of the years, then GDP per worker in Israel should have been around three times that of GDP per capita. Thus, understanding the growth of per capita GDP is the same as understanding the growth of GDP per worker.

Figure 2.4 presents a graph of labor productivity in Israel from 1955 to the present, as continuous unified data on labor are available from the Central Bureau of Statistics only from 1955 on. The labor data for the years 2012–2018 in figure 2.4 do not include the military, so they are consistent with previous years. Output per worker has grown from 83,000 NIS in 1955 to 355,000 NIS in 2018, both measured in 2015 prices.

Figure 2.4 shows that growth of GDP per worker was quite similar to growth of GDP per capita. The average annual rate of growth in output per worker in 1955–1972 was 5.47 percent, while the average growth rate of GDP per capita in the same years was 5.44 percent. In 1973–2018, output per worker has grown at an average annual rate of 1.2 percent, which is lower than the average rate of growth of GDP per capita during that period, 1.7 percent. This difference is mainly due to the rise in the rate of employment. However, the main picture of a rapid "catching up" until 1972 and lower growth thereafter remains intact.

GROWTH OF CAPITAL

Unlike output and employment, which we measure as flow variables, during a calendar year, we measure capital as a stock variable at a specific date, on December 31 of each year. This is of course a simplification, as we would like to measure the flow of services of capital during the year, but it is impossible to measure it properly. Thus, we measure instead the stock of capital. One way to improve the estimate of the services of capital during a year is to calculate the average between the stocks of capital at the end of the previous year and at the end of the current year. In normal times, this averaging does not change the amount of capital by much, as capital changes gradually, but in a fast-growing country, like Israel until 1973, it is worth doing. This book uses this procedure in some calculations.

Table 2.7 presents the average rates of growth of capital, labor, and output (GDP) in sub-periods from the beginning of the Mandatory period to the present. The table shows that capital increased very fast during the period, namely, there has been intensive capital accumulation. Actually, capital increased at a faster rate than labor did in each sub-period, so that there has been intensive "capital deepening." This means that the "capital-labor ratio," which measures how much capital each worker uses on average, increased significantly during the period.

Capital increases by physical investment. The change in capital during the year is called "net investment," which is equal to gross investment minus depreciation. The fast growth of capital in Israel, especially up to 1973, means that investment was high, relative to other countries. In the 1930s, the rate of investment out of income in the Jewish community was about 45 percent, which is very high. Investment remained high after 1948 for quite a long time. Table 2.8 presents the ratio between gross investment (including public investment) and GDP in selected years. Since the average investment out of GDP in developed countries is around 15 percent, table 2.8 shows that during many years, Israel had a high rate of investment relative to those countries. Although investment in Israel has declined over the years, it is still higher than in other countries.

A possible explanation can be the high population growth.

TABLE 2.7. Growth rates of GDP and factors of production, annual averages (percent)

Period	1922–1947	1950–1970	1970–1990	1990–2000	2000–2010	2010–2018
GDP	13.2	9.8	4.5	5.6	3.2	3.6
Labor	9.4	4.1	2.2	4.1	2.8	2.8
Capital	11.6	11.2	3.9	7.6	3.0	3.7

Source: Data on the Mandatory period are from Metzer (1998, tables A.4, A.22, A.24). Data on output and Labor after 1950 are from Central Bureau of Statistics (2019, tables 11.1, 11.2, 9.1). Data on capital for 1950–1970 are from Syrquin (1986). Data on capital after 1970 are from Bank of Israel (2019a, table 2.A.11).

TABLE 2.8. Gross capital formation, selected years (percent of GDP)

Year	1950	1955	1960	1970	1980	1990	2000	2010	2018
Investment relative to GDP	44.6	28.7	25.6	25.4	18.1	18.2	21.5	14.6	21.0

Source: Data are from Central Bureau of Statistics (2019, tables 11.1, 11.2).

The high rate of investment in Israel, before and after the founding of the state, raises a serious question about the source and financing of this investment. Increasing the rate of investment requires either a reduction of consumption, private or public, or increasing imports. If consumption declines, we say that investment is financed by saving. If imports increase, there is a trade deficit, and investment is financed by borrowing abroad or by gifts from abroad. Hence, high investment poses a serious policy dilemma, whether to finance it domestically by saving, or by foreign debt, through a trade deficit. Before describing the policy followed by the Zionist movement and later, Israel, let us briefly discuss the economics of this dilemma.

Financing investment domestically by saving increases the domestic demand for loans, which raises the interest rate, since otherwise, saving would not increase. Borrowing abroad and importing is therefore a preferred strategy, as it keeps the cost of capital low, since global interest rates would not rise due to higher demand in a small economy. However, adopting this preferred strategy requires the ability to borrow abroad, namely, to have access to financial global markets. Alas, many developing countries find it hard to borrow abroad, since foreign lenders consider lending to poor countries too risky. Hence, such developing countries need to rely on domestic saving, which slows their capital accumulation.

Unlike many developing countries, Israel was lucky to have access to foreign finance from its early days, so it financed its large investments by a trade deficit almost throughout the period of high growth. During the British Mandate, the Jewish community had a cumulative trade deficit of 115 million Palestine pounds, which were equivalent to British pounds. This deficit was financed by unilateral transfers, which were mainly money that the immigrants brought with them and Zionist donations. The money brought by immigrants amounted to 110 million pounds, and Jewish donations amounted to 65 million pounds.[11] Most of the private funds went to industry and to citrus, while most of the national funds went to rural settlements (like kibbutzim and moshavim). Hence, the money of immigrants fully financed the trade deficit.

With the establishment of the State of Israel and the large immigration of 1948–1951, the demand for investment increased significantly, due to three pressing needs. The first was to build housing for the immigrants, who lived in transitory camps (maabarot) in terrible conditions. The second was to create jobs, and the third need was to settle the periphery so as to stabilize the new

borders. However, the immigrants after 1948 were no longer wealthy. These were Holocaust survivors from Europe, who were penniless, and immigrants from Arab countries, who left because of the war and could not take significant property with them. In the absence of funding from abroad, the Israeli government turned to finance investment by forced saving. It extended the wartime policy of rationing, called "Tzena" (austerity), and made it a tool to reduce consumption.

However, the austerity policy could not last for long, as a black market for consumption goods emerged. In 1952, the government reduced investment severely and even considered stopping immigration. This was a low point that convinced the government to sign a Reparations Agreement with the government of West Germany. The agreement faced strong opposition from the Israeli public, as it was only 7 years after the Holocaust. The agreement proved to have a major economic impact. It renewed unilateral transfers in 1953, and so it renewed investment.

Thus, after a short period of financing investment by saving (actually, by forced saving), Israel returned to financing its investment by a trade deficit, as it did in the past and as it will continue to do later on throughout its rapid growth period. In the years 1949–1965, the accumulated trade deficit reached $6 billion. The financing of this deficit came from unilateral transfers of $4.2 billion and a debt increase of $1.8 billion. Of the transfers, more than $2 billion were Jewish donations, and more than $1.7 billion were West German reparations. The government received directly the German reparations and much of the Jewish donations.[12] It controlled most of the capital inflow as well, as it issued special bonds to Jews abroad, which enabled borrowing $1.4 billion during that period.[13]

In the 1960s, the German reparations to the government ended. From the 1970s, the main foreign aid to Israel arrived from the United States. Although this aid is mostly military, dollars have no color. The aid enabled Israel to finance its trade deficit and therefore to continue to finance its investment by such a deficit. Gradually, the aid became smaller relative to GDP, so the role of the government in foreign financing of investment declined. At the same time, growth also declined, and with it the demand for investment.

To summarize, except for a short period in 1948–1952, Israel financed its high investment by a trade deficit. It followed this policy because it could, as it had access to foreign finance, first through the money of immigrants, and later by the German reparations and donations from Jews worldwide. One way to understand this ability of finance is that the Jewish immigrants often had a middle-class background. They had some money when they immigrated before World War II, and after the war, Germany felt obliged to compensate the Jewish State for the losses of the Jews. Similarly, this also explains the ability of Jews everywhere to support the new state.

It is also interesting to understand the reason for this policy decision of financing investment by a trade deficit. Although we understand today that this is a better policy economically, most Israeli economists at the time worried about the large trade deficit and proposed to reduce consumption instead. However, the Zionist leadership did not want to harm domestic consumption, because they did not want to deter future potential immigrants. In other words, they chose the right economic policy not because they understood economics, but because they gave top priority to the Zionist goal of attracting more immigrants. The ability of the leadership to pursue this policy, of financing investment by trade deficits, due to availability of unilateral transfers, is one of the main answers to the question how Israel managed to grow so fast, especially in the 50 years of catching up (1922–1972).

Finally, as noted above, the two main types of physical capital are structures and equipment.

At the beginning of the Industrial Revolution, most of capital was structures, and equipment accounted for only a few percent of total capital. With the development of industrialization and mechanization, the share of capital equipment increased, even though structures are still more than half of physical capital, even in the most developed countries. In Israel, too, the share of equipment in total capital has increased continuously, from 0.25 in 1960 to 0.4 nowadays.

LAND

Land is the third major production factor, in addition to labor and capital. Usually, it does not change much over time and thus is ignored in most economic analyses. However, in Israel, this factor of production has undergone some major changes over the years. During the British Mandate, the Zionist Organization purchased land extensively. In 1949, Israel claimed control over the land left by the Palestinian refugees and soon began to build on it, settle it, and cultivate it. In the years 1949–1952, the cultivated area doubled. However, these changes in land were small relative to the changes in capital and labor, as shown above.[14]

After the war of 1967, Israel took over large areas of land, but this did not have great economic significance, since the areas used by the Israeli economy were relatively small. The areas of the settlements and the Golan areas, which are now included in the statistics of Israeli GDP, are only a few percent of the land Israel held prior to 1967. Hence, the changes in land through the entire period have been small relative to changes in labor, capital, and in output. Therefore, let us retain our focus on the two main factors of production, labor and capital, as done in the analysis of all modern economies.

Summary

This first chapter on economic growth presents the main facts of the Israeli growth process. The economic growth of Israel had already begun when it was a small Jewish community in Palestine, under the rule of the British Mandate in the early 1920s. Since then, Israel experienced rapid economic growth for 50 years, until 1972. During this period of rapid population growth due to immigration, GDP grew even faster, and GDP per capita has grown at high rates of more than 5 percent annually. Hence, the real “growth miracle” of Israel is actually these 50 years of rapid economic growth. From 1973 on, Israel has been growing at the rate of other developed countries, and its output per capita is about 65 percent of that of the United States. Hence, the period of rapid economic growth has actually been a period of “catching up.”

Thus, the main challenge of this part of this book, which studies economic growth in Israel, is to understand what enabled Israel to catch up with the developed countries, despite its location in a less-developed region, the Middle East and North Africa. This chapter already points to a first element of an explanation. It shows that Israel could accumulate capital quickly, which is necessary for economic growth, by sustaining large trade deficits. Most developing countries find it hard to finance such deficits, which slows their accumulation of capital significantly. Israel was able to run such deficits because of large inflows of unilateral transfers from abroad. First came immigrants with money during the British Mandate, then West German reparations after 1953, then US aid after 1970, and Jewish donations throughout the period. The decision to sign the Reparations Agreement with Germany, and in general the willingness to grow by large trade deficits, also shows the importance of policy making in the success of Israel’s growth.

1. GDP and population are from Central Bureau of Statistics (2019), table 11.2 and table 2.1, respectively.

2. See Central Bureau of Statistics (2019), table 14.10.

3. World Bank, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=US, accessed on April 3, 2021.

4. See: https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD.

5. Average income is GDP per capita minus depreciation and indirect taxes. However, GDP per capita is a sufficiently good measure for comparisons of income, both over time and across countries.

6. Data are from Central Bureau of Statistics (2019), table 11.2.

7. See Central Bureau of Statistics (2019), table 9.1.

8. Growth was stable except for the years 1929–1945, which included the Great Depression and World War II.

9. Clearly, these figures are less accurate than the data from the later period.

10. See Feenstra et al. (2015), PWT version 9.1. Calculation for years prior to 1950 was done using past rates of growth in both countries.

11. These data are from Halevi and Klinov-Malul (1968), table 4.

12. There were also additional German reparations to individual survivors, but a large part of the reparations went directly to the government to enable it to absorb Holocaust survivors.

13. These data are from Halevi and Klinov-Malul (1968), table 57 and table A.11.

14. The irrigated area increased much more, due to investments in water infrastructure. The irrigated area increased three-fold in 1949–1955. After the completion in 1965 of the National Water Carrier, from the Sea of Galilee to the Negev, the irrigated areas grew by even more. These data are from Central Bureau of Statistics (1981), table 13.1.

3

Explaining Israeli Economic Growth

How Do We Explain Economic Growth?

Economic growth is a process of continuous rise of GDP per capita over many years, where GDP is the aggregate amount of final goods produced in the economy. Since economic growth is a macroeconomic phenomenon, it is necessary to look at the aggregate market for final goods. As for any other market, this one also has both supply and demand. To understand economic growth, we should focus on the supply side rather than the demand side, mainly because increasing demand can make the economy grow only if it is in a recession and if the rate of unemployment is high. Then rising demand can pull the economy toward full employment. However, once the economy reaches full employment, production reaches maximum capacity, and growth stops. Hence, demand can spur output growth temporarily, but not over the long run. Thus, to understand how capacity grows over the years, we need to focus on the supply of goods.

Chapter 2 highlights the two main factors of production in a modern economy, labor and capital, and shows how they increased over time in Israel. If there are more workers, or if there is more capital, output increases. This relationship between the factors of production and output is a major concept in modern economic theory, called the "aggregate production function." This function describes how much an economy can produce per year for any given amount of labor and for any given amount of capital. Thinking about economic growth in terms of such an aggregate production function already frames the search for an explanation of growth. There are three potential "suspects." One is growth of labor, the second is growth of capital (or capital accumulation), and the third is growth of the production function itself. The latter means the ability of the economy to produce more even without increasing labor or capital but by being more productive. Hence, economists call such changes of the production function "productivity growth," or growth of "total factor productivity."

This chapter, therefore, poses two main questions. First, what is the relative contribution of each of these three "suspects" to Israeli economic growth? Second, what lies behind productivity growth? In answering these questions, the chapter focuses on the growth of output per capita, or output per worker, which are similar, as chapter 2 shows. This is the true puzzle of Israel's rapid economic growth.

Labor Growth and Capital Deepening

Although labor input in Israel increased significantly over the years, it cannot be the single explanation to its economic growth. Chapter 2 demonstrates that output per worker in Israel increased strongly over the years. However, according to economic theory, if only labor

increases, then output rises, but output per worker declines. This is a result of a very basic assumption in economics, of diminishing marginal productivity of factors of production. To understand this assumption about labor, imagine a factory that uses one building and a certain number of machines. As it hires more workers, each additional worker contributes less and less, as she has fewer tools and machines, and less space to work with. A similar argument explains why capital has diminishing marginal productivity as well.

The assumption of diminishing marginal productivity of labor implies that output per worker is diminishing with the number of workers as well. To understand this implication, conduct a simple thought experiment. Place all the workers in the economy in an ordered line. Output of the first is highest, of the second lower, and so on, because of diminishing marginal productivity. Total output is the sum of the output of all workers and hence, output per worker is the average of all marginal productivities. This average declines as more workers arrive, since the new ones contribute less. Hence, output per worker decreases with labor if other inputs do not change. Thus, to explain the increase in GDP per worker in Israel, it is not enough that labor has increased: There must have also been significant changes in capital and possibly in the production function as well.

Another important assumption that economists apply to production functions is that they have "constant returns to scale," which means that increasing both labor and capital by the same ratio increases output by the same ratio as well. This assumption reflects the rationale of duplication, where uniting two similar countries makes their joint output twice the output of each country. Note that if doubling labor and capital doubles output as well, output per worker remains unchanged. Hence, to raise output per worker, capital needs to grow by more than labor. Namely, the capital-labor ratio has to rise. This is called "capital deepening."

Indeed, chapter 2 shows that over the years, capital increased faster than labor, so that Israel went through continuous capital deepening. Hence, this can be an explanation of Israel's rapid economic growth. Fast capital accumulation, which was faster than population growth and the growth of labor, led to capital deepening, and that led to growth of output per worker and of output per capita. This is a plausible explanation, but the next section finds that it is insufficient. It finds that output growth in Israel, as in other countries, significantly exceeds the growth explained by the mere expansion of labor and of capital. Hence, we cannot fully understand economic growth in Israel without taking into account growth in productivity, namely, growth of the production function itself.

The Solow Residual

In a pathbreaking economic article, Robert Solow (1957) showed how to calculate the contribution of growth of labor and of capital to output growth. He then showed that for US data from the years 1909–1949, the sum of these two contributions was significantly lower than the actual rate of growth. Hence, he could not escape the conclusion that there has also been productivity growth in addition to growth of labor and of capital. Actually, Solow found that capital deepening accounted for only 13 percent of growth in output per worker. Hence, he found a residual of 87 percent, which he interpreted as growth of productivity. Economists ran similar tests for longer periods and for many more countries. Their results where similar, though a bit weaker, as they found that capital deepening accounted usually for one-third of the growth in output per worker. They interpreted the remaining two-thirds, called "Solow residuals," as

growth in productivity.

The method that Solow developed, called "growth accounting," relies heavily on the assumption of constant returns to scale, which claims that if capital and labor grow by the same rate, output grows by the same rate as well. Solow generalized that assumption and showed that output growth due to growth of labor and capital is a weighted average of the growth rates of the two factors. He even calculated the two weights and showed that in situations of perfect competition, they are equal to the shares of labor and of capital in output, respectively, which sum up to one. Usually, the share of labor in GDP is around two-thirds, and the share of capital in GDP is around one-third. Jones (2016) suggests the use of the constant weights 2/3 and 1/3 for "growth accounting" to avoid fluctuations in the weights when the economy deviates from perfect competition. This book follows this suggestion as well.[1]

Table 2.7 in chapter 2 shows that output growth in all sub-periods exceeded the weighted average of the rates of growth of labor and capital. Thus, growth of labor and capital alone could not account for all output growth in Israel. Productivity has gone up as well. Syrquin (1986, pp. 49–53) calculated the Solow residuals for the Jewish community in Mandatory Palestine and for Israel until the 1970s, and I calculated them for later periods.[2] The results are quite robust. During the years of rapid growth (1922–1972), Solow residuals were on average 3.7 percent per year.[3] As GDP per worker grew at an average annual rate of 5.5 percent in these years, Solow residuals were equal to two-thirds of the growth rate of GDP per worker. After 1972, the Solow residuals were on average 0.63 percent annually, which is more than half of the growth rate of output per worker in that period. Thus growth in Israel was, and is, not only a result of the increase in labor and capital but also of continuous productivity growth.

The striking conclusion is that in addition to labor and capital, productivity has grown as well, and it has actually accounted for most of Israel's economic growth. That leads us to the following three issues. The first is how to parametrize and measure the growth of productivity over time. The second is to examine how productivity affects the economy. And the third issue is to examine what productivity is and why it grows over time. Since we do not measure productivity directly, but as a residual, it is so far a large "black box."

Total Factor Productivity and Its Effects

Let us first assume that we can compress all the changes in the production function over time into a single variable, total factor productivity (TFP). Unlike Solow (1957), I assume that this variable is labor augmenting and does not multiply the production function. Hence, let us call it "labor-augmenting total factor productivity" (LATFP). The formal definition of such productivity is given in appendix 1. Informally, if LATFP increases by 5 percent, it is equivalent to increasing labor by 5 percent. Using this definition, we can subtract from output growth the contributions of labor and capital growth and calculate the rate of growth of LATFP, as shown in appendix 1. The choice of LATFP instead of the more standard TFP is because it simplifies the analysis.[4]

Figure 3.1 presents LATFP in the business sector for the years 1960–2018. It focuses on the business sector, because that sector sells its products in markets, which enables good measurement of output. In the public sector, output is measured by the cost of production, and hence productivity in this sector is underestimated. Figure 3.1 shows that productivity indeed increased throughout the period, in addition to the increase in labor and capital. The figure also

shows that overall productivity rose fast until 1972 and more slowly thereafter. However, the average annual rate of growth of productivity after 1972 was 1.8 percent, which is fine by international standards.

Note that LATFP has two effects on output, one direct and the other indirect. The direct effect is simply the rise in output due to higher productivity. Actually, if LATFP rises by 1 percent, it is equivalent to increasing labor by 1 percent, which increases output by 1 percent times the elasticity of output with respect to labor (which is approximately 2/3). Hence, the direct effect of productivity on output is around 2/3 times the growth of productivity.

However, productivity has an indirect effect on output as well. As productivity rises, marginal productivity of capital rises as well. Since this marginal productivity is equal to the rate of gross profit, its rise induces investment in capital. Investment increases the stock of capital, which lowers the marginal productivity of capital—namely, it lowers the rate of profit, until it returns to its equilibrium level. The increase in capital increases output as well, and this is the indirect effect of productivity on GDP.[5] We next turn to estimating the size of the two effects together, the direct and the indirect, and compare it to actual growth in Israel.

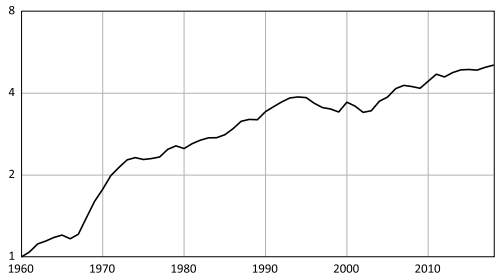

FIGURE 3.1. Labor-augmenting total factor productivity in the business sector in Israel, 1961–2018.
Data are from Bank of Israel (2019c, tables 2.A.10, 2.A.12, and 2.A.14). Annual quantities of capital are averages of each year and the previous year. The logarithmic scale is 2.

We use a basic equilibrium condition in economics, which states that the rate of gross profits (namely, the marginal productivity of capital) should be equal to the gross marginal cost of capital. If the rate of gross profits exceeds the cost of capital, there is incentive to invest, and capital grows. As capital increases, marginal productivity of capital diminishes. Only when this marginal productivity becomes equal to the cost of capital does the stock of capital stop growing, and the economy reaches equilibrium.

What is the cost of capital? When investors add one unit of capital, it has an annual cost, which is the sum of three main costs. One is the real interest rate, as investors usually borrow in order to invest, and then they pay the interest annually.[6] The second cost is the rate of depreciation of capital, which measures the annual physical erosion of capital. The third element is a risk premium, which accounts for overall risk that investors face when building a new business or expanding an existing one. The sum of these three elements is the total marginal cost of capital. Appendix 1 shows how the cost of capital determines the equilibrium amount of capital and through it the equilibrium GDP, and GDP per worker, or labor productivity.

To apply this general equilibrium condition to Israel, we have to make assumptions about the cost of capital in Israel over the years. Our main assumption is that this cost is constant over the years. This assumption is reasonable with respect to the rate of depreciation. This technical parameter varies over different types of capital: high for computers, low for cars, and very low

for structures. However, assuming that the composition of capital does not change often, we can assume that it is constant over time. Indeed, empirical tests have shown that the average rate of depreciation is quite stable and is between 8 and 10 percent. Assuming that the interest rate is constant over time is a stronger assumption, and it actually implies that the economy was open to capital inflows. Otherwise, any change in investment might put pressure on domestic capital markets and affect the interest rate. Hence, this assumption means that the real interest rate is the global rate, which is quite stable over time. Finally, let us also assume that the risk premium in Israel was stable over time.

Appendix 1 explains how to use the assumption of a constant cost of capital to calculate the equilibrium output per worker, or labor productivity, once we know the LATFP. This enables us to compare the equilibrium labor productivity with the actual labor productivity in the business sector, measured as output per hour, over the years 1960–2018. Since we do not calculate the level of the virtual equilibrium output, but only its annual rate of change, we fix its value in the initial year, 1960, to the actual labor productivity in that year. This enables us to examine whether the two variables move together or not, as done in figure 3.2. The continuous curve represents the actual output per hour, while the dotted curve represents the virtual equilibrium output per hour.

The two curves in figure 3.2 overlap each other quite well. Thus, the model equilibrium output per hour fits the actual historic output per hour well. Hence, this figure supports strongly the two main assumptions made above. The first is that the only exogenous change in the economy was growth of productivity, which affects output both directly and indirectly. The second assumption is that the cost of capital was constant over time. The support for these assumptions yields two important conclusions. The first is that the growth of productivity, through its direct and indirect effects, explains the entire growth in GDP over time. In other words, we can explain all the growth in Israel by the growth of productivity alone. This is one of the main results of this chapter.

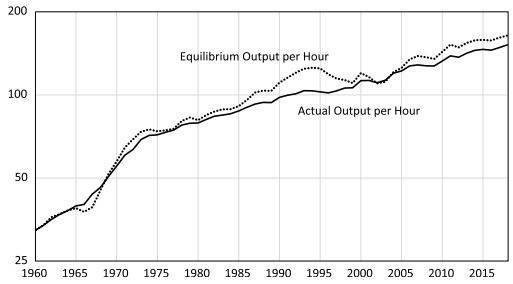

FIGURE 3.2. Actual versus equilibrium labor productivity in the business sector in Israel, 1960–2018.
Data for the equilibrium output are from figure 3.1. Data for actual labor productivity are from Bank of Israel (2019c, table 2.A.10).

The second conclusion is that Israel has behaved as an open economy with free capital mobility, at least on the borrowing side. We know that during many years, Israelis could not purchase foreign currencies and were limited in their ability to import goods. However, figure 3.2 shows that capital imports could enter the country. This is not surprising, as chapter 2 shows that Israel financed its capital accumulation by foreign funds, mainly by unilateral transfers. The transfers consisted of the wealth of immigrants during the British Mandate, German reparations after 1952, Jewish donations throughout the period, and US aid after 1970. These unilateral

transfers reduced the current account deficit significantly, so that Israel could borrow in global capital markets. Hence, it actually faced a low global marginal interest rate.

The conclusion that growth in productivity can explain all economic growth in Israel raises new questions. The main one is: What explains the growth in productivity itself? Have we not replaced one economic puzzle with another? So far, productivity is no more than a "black box," as we calculate it as a residual and do not measure it directly. Indeed, economists are trying to crack this black box with only partial success. The rest of this chapter focuses on two main factors that raise productivity. One is expansion of education, which increases human capital, and the second is technical progress.

Human Capital

Since the 1950s, many statistical studies have shown that employees' years of schooling raise their wages significantly, at an average rate of 10 percent per year of schooling. The main explanation of these findings has been that education creates "human capital," defined as the skill of a worker, which enhances job performance. Indeed, many studies support this hypothesis, as described in chapter 13. These numerous microeconomic studies, based on very large databases, measure quantitatively the contribution of education to wages. Appendix 2 shows that the wages of a worker are proportional to her human capital in equilibrium. Thus, the measures of the effect of schooling on wages translate to the same effect of schooling on human capital.

Macroeconomists, who study economic growth, recently have begun to use the results of these microeconomic studies to examine the contribution of education not only to the productivity of individual workers but also to that of the entire economy. This calculation uses national data on education attainment together with the results of the microeconomic studies on schooling, to calculate the average human capital in the country. Economists call such calculations "development accounting," and they have used them mainly for comparisons across countries. This chapter uses them to examine the contribution of education to economic growth in one country, Israel, over the years. As education expands, average human capital rises, which increases productivity. Hence, human capital is part of LATFP.

Most studies of "development accounting" use average results of many studies to calculate the effect of years of schooling on human capital. In an important survey of development accounting, Francesco Caselli (2005) uses such averages and shows that each year of schooling between 0 and 4 years increases human capital by 13 percent, each year of schooling between 4 and 8 increases human capital by 10 percent, and each year above 8 increases human capital by 7 percent. Since we do not conduct an international comparison, but study Israel over time, I prefer to use results measured in Israel.

Chapter 13 and appendix 9 use data from the Income Survey in Israel in 2011 to measure the effect of years of schooling on wages. Table 3.1 uses these results and presents them in its first row, where human capital of no schooling is normalized to 1. The numbers illustrate the strong effect of education on productivity in Israel. The human capital of a graduate of elementary school is twice as high as that of a worker with no education at all. The human capital of a high school graduate is 1.5 times that of a worker who completed only elementary school. Human capital of a university graduate is almost 40 percent higher than that of a high school graduate. The second row in table 3.1 presents the human capital at each year of schooling according to Caselli (2005) and shows that the results from the Israeli data are quite close to the international

averages.

TABLE 3.1. Years of schooling and human capital in Israel, 2011

Years of schooling	6	7	8	9	10	11	12	13	14	15	16
Human capital in Israel	1.95	2.16	2.39	2.63	2.90	3.18	3.48	3.80	4.14	4.50	4.88
International data on human capital (Caselli, 2005)	2.05	2.27	2.51	2.69	2.97	3.19	3.42	3.67	3.94	4.22	4.53

Note: Calculation based on regression (5) in table A.3, appendix 9.

To calculate average human capital in each year in Israel, let us apply the first row in table 3.1 to data on years of schooling in Israel. Education in Israel was already high relative to other countries during the British Mandate, due to the high education of immigrants. Of the immigrants from Central and Western Europe, 55 percent had more than elementary education, and so did 35 percent of the immigrants from Eastern Europe.[7] By comparison, the share of people with more than elementary education in the United States in 1950 was 38 percent. In addition to the arrival of educated immigrants, the Jewish community invested considerable funds in its public education system. After 1948, the education of immigrants declined significantly. While the median of years of schooling of men who immigrated until 1947 was 9.9 years, the median for men who immigrated in 1948–1951 was only 7.7 years. These immigrants were Holocaust survivors from Europe, who did not finish their studies due to the war, and immigrants from Arab countries, where education levels were lower.

Immediately after 1948, the new state began to invest massively in public education. Table 3.2 describes the distribution of schooling in Israel among the population of age 15 and above over the years. Note that Israel has very little private education, so most of the expansion of schooling was done by public education. It demonstrates the enormous effort Israel put into expanding education and how effective that effort has been. It not only afforded education to the increasing population, but also raised average education quite rapidly. Clearly, some of the rise in education was due to high education in later immigration waves, mainly in the 1990s. However, the main increase in schooling over the years was the product of the expanding system of public education and the funds it received from the government that enabled that expansion.

TABLE 3.2. Distribution of education in Israel, selected years (percent of age group 15 years and older)

Years of schooling	1954	1961	1970	1980	1990	2000	2010	2018
0–8	78.9	58.9	51.4	35.4	25.0	15.3	10.7	7.4
9–12	17.7	32.0	36.8	45.4	49.7	47.3	44.9	42.4
13+	3.4	9.1	11.8	19.2	25.3	37.4	44.3	50.2

Source: Data are from Central Bureau of Statistics (1960, table 19.32; 2001, table 8.1; 2019, table 4.80).

To examine the effect of education and human capital on the economic growth of Israel, I first calculate the average human capital every year by combining data on the distribution of years of schooling with the data in table 3.1 on the effect of years of schooling on human capital.[8] Actually, human capital of each worker depends not only on schooling but also on age, personal talent, and other variables. However, the distributions of age and the other variables do not change much over time, while the distribution of years of schooling changed rapidly due to the expansion of education. This circumstance justifies calculation of the dynamic variable of human capital by use of the distribution of schooling only.

Next, I calculate the equilibrium output per worker if the only change in the economy is in education. This calculation, explained in appendix 2, also follows from the earlier assumption in this chapter that the cost of capital is constant over time. Figure 3.3 compares the actual GDP per worker in 2015 prices (the solid curve) with the equilibrium output per worker if only education changes (the dotted curve). Since the calculation is only for changes in equilibrium output per worker and not the absolute value, I shift this curve and make it coincide with the actual output curve at the year 1973. Note that figure 3.3 describes output per worker in the whole economy and not in the business sector only, as data on the distribution of schooling is for the whole economy only.

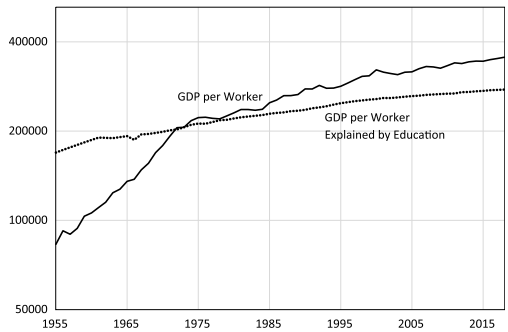

FIGURE 3.3. Output per worker, actual and explained by education, 1955–2018.
Data on output per worker are the same as in figure 2.4. Data on education are from Central Bureau of Statistics (1960, table 19.32; 1966, 20.35; 1967, table 20.34; 1968, table 20.35; 1969, table 19.36; 1970, table 19.39); Central Bureau of Statistics (1972, 1973, 1974, 1975, 1978, 1979, 1980, 1986, 1987, 1988, 1990, 1994, 1998, table 22.1) and Central Bureau of Statistics (2001, table 8.1; 2005, table 8.3; 2019, table 4.80).

Figure 3.3 shows that the level of education increased gradually throughout the period, and it explains a significant part of economic growth but not all of it. In recent years (1973–2018), education explains growth in output at an average annual rate of 0.65 percent. Since output per worker increased at an annual rate of 1.2 percent during this period, it means that 54 percent of economic growth has been due to the expansion of education. If we compare the rise in education to the rate of growth of output per worker in the business sector and not in the total economy, we see that it accounts for 37 percent of growth. In both cases, the expansion of education explains a significant part of economic growth during this period. During 1955–1973, education expanded rapidly due to large investments in education by the new state, so that human capital grew at an average annual rate of 1.1 percent. However, as output per worker grew much faster during these years, at an annual average of 5.2 percent, education accounted for only 21 percent of this rapid growth.

The contribution of education to output growth in Israel after 1973 is quite significant and

accounts for around 40 percent of output growth.[9] Actually, these figures are not unique to Israel, as shown in a comparison with some other developed countries, which grew at similar rates over the past 40 years, such as the United States, the United Kingdom, Germany, France, Japan, and Sweden. I calculated for each country an estimate for human capital, based on data on average schooling from Barro and Lee (2020) and using the Caselli (2005) method of development accounting. The calculations show that from 1970 to 2010, human capital in the United States grew at an average annual rate of 0.4 percent, in the United Kingdom at 0.7 percent, in Germany at 1 percent, in France at 2.3 percent, in Japan at 0.5 percent, in Sweden at 0.7 percent, and in Israel at 0.6 percent. Israel seems to be in the middle of the distribution of growth rates of human capital and thus in its contribution to growth.

Finally, the reader must keep in mind that what this section presents for the early years of the state is an underestimate of the effect of public education. The reason is that those were years of mass immigration from Arab countries, where education of Jews in these countries was on average lower than among the domestic population. Thus, immigration itself should have reduced average human capital. Despite this effect, the fact that schooling increased so much is a testimony to the heroic contribution of the public education system in those early days of the state.

Adding the Kuznets Effect to Human Capital

Interestingly, the early years of the state witnessed another growth of human capital in addition to education expansion, through absorption of immigrants. According to Simon Kuznets and many other economists, immigrants lose a large part of their human capital—more than 50 percent—on arrival in their new country. This is due to lack of knowledge of the local language, the search for a fitting job, gaps in technology between the two countries, and other required adjustments. It takes immigrants around 20 years to adjust to the new country and for their human capital to return to a level that fits their original education. This is of course an average effect: Some immigrants might do better, but others might even do worse.

The macroeconomic implications of this Kuznets effect on Israel were far reaching, and Kuznets (1973) himself noted it and analyzed it.[10] The large immigration wave of 1948–1951 doubled the population in Israel. Over the next 20 years, until 1972, these immigrants underwent a process of gradual absorption, which increased their human capital by 100 percent, as it had fallen to half upon their arrival. Thus the human capital of the immigrants grew at an average annual rate of 3.5 percent during these 20 years. Since new immigrants made up more than half of the workforce in Israel during those years, we have that the Kuznets effect contributed to an annual growth of human capital of 1.75 percent. Output per worker in equilibrium grows proportionally to human capital, as appendix 2 shows, so the absorption of immigrants explains a growth of 1.75 percent of output per worker, which amounts to about one-third of it.

Figure 3.4 shows how this effect adds to the explanation of economic growth by human capital. It adds the effect of absorption of the large immigration wave of 1948–1951 to the expansion of education in the years 1955–1973.[11] The dotted line in the figure presents the combined effects of education and the Kuznets effect, while the solid curve is actual output per worker. Figure 3.4 shows that human capital explains a much larger part of economic growth, now that it takes into account the absorption of immigrants. Human capital explains an average annual growth rate of 2.8 percent in these years, which is 55 percent of the growth of output per

worker.

This analysis demonstrates that growth of human capital through expansion of education and through absorption of immigrants in the early years of the state accounts for a large part of the growth of output in Israel. Part of the explanation for the rapid expansion of education in the early years is the high human capital of previous immigrants, those who arrived during the British Mandate. They helped to build a high-quality educational system, playing leading roles as teachers, lecturers, and researchers.

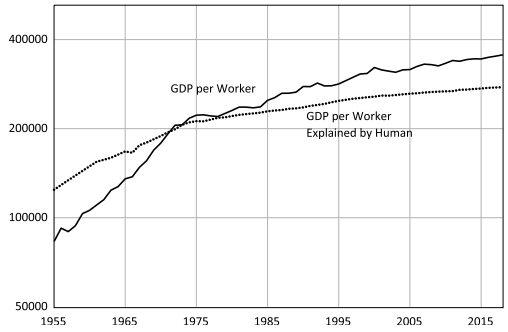

FIGURE 3.4. Output per worker. Actual and the part explained by human capital, 1955–2018. Data are from figure 3.3 and from calculations by the author.

The Kuznets effect can shed light on another interesting question: Why did the shift from high to low growth, the unavoidable end of catching up, occur in 1973 and not in any other year? Economists have offered various explanations for this, such as the war of 1973 and the accelerating inflation at the time. However, peace with Egypt in 1979 ended the conventional wars, and high inflation ended in 1985. Nevertheless, growth rates never returned to their pre-1973 levels. The Kuznets effect offers another explanation of this puzzle. It took 20 years for the immigrants of the early days of the state to integrate into the economy. These 20 years ended in the early 1970s. When the absorption of this large group of workers ended, the economy experienced a drop in its growth rate.

Technical Progress

An earlier section shows that total factor productivity growth accounts for all growth in Israel over the years, directly and indirectly, as it boosts capital deepening. In the previous two sections, we began to dissect the growth of productivity into growth of human capital and all the rest. We saw that the growth of human capital has accounted for at least 40 percent of growth in productivity. That leaves us with a large part of productivity growth yet to be explained. In this section, we examine the contribution of the adoption of technologies.

The new research on economic growth, which began in the late 1980s, places great emphasis on technological changes as an engine for global economic growth since the Industrial Revolution.[12] That research deals less with the spread of technology across countries. Here, Israel was very lucky. As a country that joined economic growth at a relatively late stage, it enjoyed faster technical change than did older developed countries. The reason is simple: Such a country does not need to wait for inventions of new technologies in order to adopt them. It can adopt technologies invented long before and take them off the shelf.

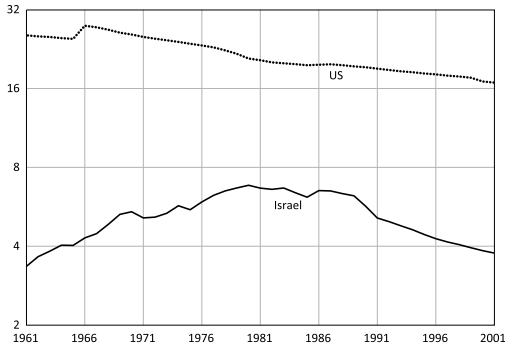

FIGURE 3.5. Number of agricultural tractors per 1,000 people in Israel and the United States. Data are from Comin and Hobijn (2010), and the logarithmic scale is 2.

To support the claim that Israel has adopted technologies at a faster rate than other developed countries in its years of rapid growth, I use data on the adoption of technologies across countries from Comin and Hobijn (2010). Using this data set, this section presents four important innovations and compares their adoption in Israel and in the United States.[13] It compares quantities per capita, which are comparable across countries and over time. The choice of the United States is because it is the global leader in technical change. The first technology is agricultural tractors, so the variable in figure 3.5 is the number of tractors per 1,000 people. The solid curve represents Israel and the dotted curve the United States.

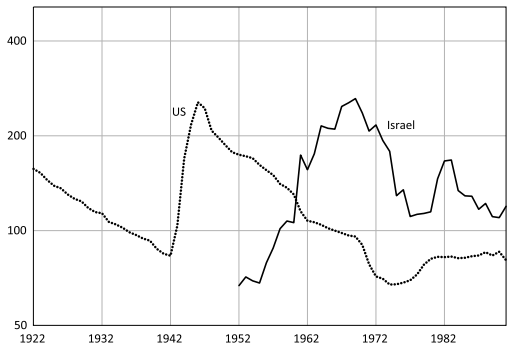

FIGURE 3.6. Shipping tons per 1,000 people in Israel and the United States. Data are from Comin and Hobijn (2010), and the logarithmic scale is 2.

Between 1961 and 1970, during the period of rapid growth, the number of tractors per capita in Israel increased at an annual rate of 9 percent. This rate is very fast and supports the assumption of rapid adoption of technologies. In 1971–1980, it grew at 5 percent annually, slower but still quite fast. In contrast, the use of tractors in the United States declined throughout the period, which implies that the adoption of tractors occurred in the distant past, while Israel adopted the technology until the late 1970s. Interestingly, the United States uses four times more tractors per capita than Israel, since it is more agricultural.

Figure 3.6 describes the adoption of cargo shipping in the two countries, measured by the number of tons per 1,000 people. The amount of cargo transported by the United States increased sharply when it entered World War II but then declined back to its long-run value. Adoption of cargo shipping in Israel was very rapid between 1950 and 1970, followed by relative stabilization. During the years 1952–1972, the number of tons per capita has increased at an

average rate of 9.7 percent a year, which is much higher than the rate of productivity growth. Interestingly, at the end of the adoption process, Israel ships more per capita than the United States does. This is not surprising, since international trade is relatively larger in Israel, as the United States is more self-sufficient due to its size, so it needs less trade.

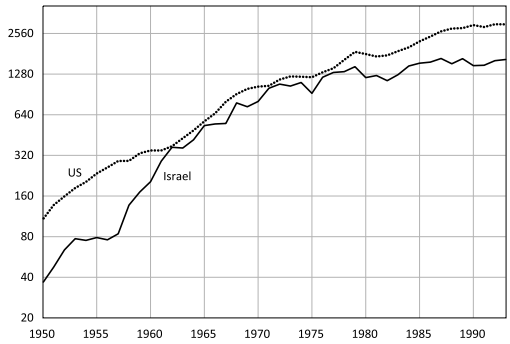

FIGURE 3.7. Aviation passenger kilometers per 1,000 people in Israel and the United States. Data are from Comin and Hobijn (2010), and the logarithmic scale is 2.

Figure 3.7 describes the adoption of another technology, civil aviation, by presenting passenger kilometers per 1,000 people in each country over time. Clearly, the use of passenger aviation is increasing in all countries due to increasing income and growing availability of air transportation over time. However, figure 3.7 shows that the rise in aviation in Israel in the early years of the state was much faster than in the United States. Actually, during the years 1950–1973, the number of kilometers traveled by air per person in Israel increased at an annual rate of 20 percent, while in the United States, it increased by 13 percent annually. The difference of 6.6 percent is a good measure of catching up in Israel.

Finally, figure 3.8 shows the adoption of telephones in both countries by plotting the number of telephones per 1,000 people. This number grew gradually in both the United States and Israel, but the growth in Israel was much faster (the slope of the curve is much steeper). The average annual rate of increase of telephones per capita in the years 1950–1973 was 15 percent, which is very fast. After 1973, the rate of growth of telephones was lower (8 percent).

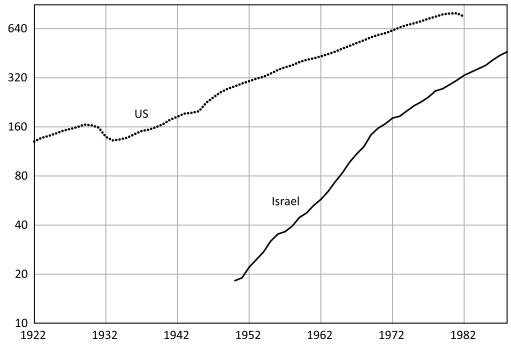

FIGURE 3.8. Telephones per 1,000 people in Israel and the United States. Data are from Comin and Hobijn (2010), and the logarithmic scale is 2.

These four examples and others show that until 1972, Israel adopted various technologies at an accelerated speed, much faster than developed countries like the United States did. This

accelerated rate of technology adoption contributes to the explanation of Israel's rapid economic growth in those years. While technical change in the developed countries was bounded by arrival of new technologies, Israel could adopt older but important technologies, available off the shelf. Of course, availability of technologies off the shelf does not mean that every country can adopt them, as adoption requires large investments. There is a need to purchase tractors, to lay telephone lines, to buy ships and airplanes, and to build ports and airports, to mention the few examples discussed above. Many countries might find it hard to finance such large investments.

Summary: Productivity, Human Capital, and Technical Progress

This chapter analyzes economic growth in Israel by using the concept of the aggregate production function. According to this concept, the usual "suspects" that cause economic growth are growth of labor, growth of capital, and growth of the production function itself (namely, productivity growth). However, the analysis in this chapter shows that the main exogenous driver of economic growth in Israel, as in other countries as well, has been productivity growth. The sum of its direct effect on output, plus its indirect effect through profitability and investment in capital, explain all the growth of output per worker. Due to this conclusion, the chapter focuses on what drives productivity growth. It reaches two main answers: growth of human capital and fast adoption of technologies, mainly off the shelf.

To examine the role of human capital, the chapter uses the new tools of development accounting. It shows that Israel experienced a rapid expansion of its education system, which is mainly public, throughout the years. As a result, education accounts for almost half of Israel's economic growth in the period of moderate economic growth (after 1973). In the period of rapid economic growth (until 1973), human capital increased due to education but also due to absorption of immigrants into the Israeli labor market. Hence, in that period as well, growth in human capital accounts for almost half of economic growth.

The chapter then examines technical progress in the period of rapid economic growth and raises the hypothesis that Israel could adopt many technologies quickly by taking them off the shelf, as they were developed earlier. Indeed, using data on technology adoption the chapter shows that Israel adopted important technologies until 1973 much faster than the United States did. This supports the hypothesis that Israel could adopt technologies off the shelf, which contributed to fast productivity growth.

These findings point to human capital and to the adoption of technologies off the shelf as the main explanations for the fast economic growth of Israel and its ability to catch up with the frontier. However, what enabled Israel to succeed in these two important projects, which are so hard to accomplish in many poor countries? In my opinion, there are three main explanations for this success. One was the high human capital of the Jewish immigrants who came from Europe, especially during the Mandatory period. This human capital not only increased labor productivity but also helped build an impressive education system.

A second factor that helped Israel was the availability of foreign funds. Before 1948, the Yishuv financed its large investments using funds brought in by immigrants and by Zionist donations. After 1948, when immigrants were penniless, the reparations from postwar Germany and donations from Jews worldwide supplied the necessary finance for the rapid economic growth. This finance helped in four ways. It helped create new jobs, which absorbed the new graduates of the education system. It enabled building houses for the new immigrants. It financed

the fast adoption of earlier technologies, and it financed the expansion of the education system. These two factors, high human capital and available finance, were both results of the middle-class origin of the immigrants who reached the country and had both high education and some financial wealth.

However, there was a third important factor, which used these factors and channeled them toward fast economic growth: the quality of government and in general of the public sector in the Yishuv and in the State of Israel. This is reflected in the deep involvement of the public sector in the growth process by building housing, by creating a great education system, and by investing directly in infrastructure (electricity, water, oil, and ports). All of this was done with high efficiency, which reflected the high quality of those who joined the public sector, eager to push forward the development of the new Zionist project.

The high quality of the public sector also shows in the decisions taken by the Zionist leadership, first in the Jewish Agency, and then in the government of Israel. Three major decisions enabled this process. The first was to finance the growth of the economy by a trade deficit and not by saving. The second decision was to use large funds, both from taxation and from donations, to build and expand the system of public education. The third important decision was to sign the Reparations Agreement with postwar Germany. This decision was very unpopular, but the government insisted on it, as it realized that this was crucial for the economic success of the young country.

1. The results are very similar when using the actual shares of labor and capital as weights.

2. The data for output and labor are from Central Bureau of Statistics (2019), tables 11.1, 11.2 and 9.1, with adjustment to labor in 2012–2018. Data on capital are from Bank of Israel (2019c), table 2.A.12.

3. Metzer and Kaplan (1990, p. 164) found higher productivity growth than Syrquin (1986) in Mandatory Palestine.

4. The results below remain unchanged when using the standard TFP.

5. While this indirect effect had been known for some time, it first appeared formally in Barro and Sala-i-Martin (2005, chapter 10).

6. Even if they do not borrow but instead finance the investment by their own funds, the opportunity cost of these funds is the interest rate they could get at the bank for their money. A similar argument applies to financing by issuing stocks. These are famous results by Modigliani and Miller (1958).

7. See Easterlin (1961).

8. There are no data on schooling between 1954 and 1961 and for the years 1962 and 1964. I add the missing data by extrapolation.

9. Another recent study that also applies “development accounting” to Israel is Argov (2018), which also uses coefficients obtained for Israel and reaches very similar results.

10. He found that the income of new immigrants from Asia-Africa was 42 percent of that of incumbents, while the income of immigrants from Europe-America was 56 percent of that of incumbents.

11. Since these immigrants arrived before 1955, their years of schooling do not affect the previous calculation.

12. See Romer (1990), Grossman and Helpman (1991) and Aghion and Howitt (1992).

13. I am grateful to Diego Comin for allowing me to use his data set.

4

High-Tech, High Fertility, and Missing Capital

Recent Developments

Israel's rapid economic growth occurred in the 50 years from 1922 to 1972, when it caught up with the advanced countries. However, the story of economic growth in Israel did not end in 1973. Although growth after 1973 has been similar to that of other developed countries, it still involved some fascinating stories, to which this chapter is devoted. One is the story of the high-tech sector in Israel. The second is the discovery of large deposits of gas in the territorial waters of Israel. The third story is Israel's high rate of fertility, and the fourth is its low labor productivity relative to other advanced countries. Before telling these stories in detail, here is a brief review of each.

In the past 30 years, Israel became a famous center for high-tech, mainly information and communication technologies (ICT), so that many in the popular media call Israel the "Start-Up Nation."[1] This chapter describes the development of this sector, explains how it emerged, and assesses its contribution to the aggregate economy. Another recent development in Israel is the discovery of large gas fields in its territorial waters in the Mediterranean. This gas increases the energy resources and the GDP of Israel. The chapter estimates the contribution of this newly found resource to Israeli productivity.

Everyone who visits Israel and the Israelis themselves notice how crowded Israeli roads are and how expensive housing is. There are many reasons for this, but one of the main ones is high fertility in Israel, which leads to high population growth and as a result, high population density.

Finally, although the success of the high-tech sector and the discovery of gas fill Israelis with pride, many of them find other aspects of recent economic growth disappointing. The main source of disappointment for many professional economists is what they call the "low labor productivity." We can rephrase this issue in terms of our description of economic growth in chapter 2 in the following way: Why couldn't Israel catch up fully with the advanced countries? Why did its period of rapid growth stop when GDP per capita was lower by 30 to 40 percent than in these countries? This chapter explains a big part of this gap.

The High-Tech Sector: Progress and Scale

In 1979, Israel signed a peace agreement with Egypt. As chapter 1 explains, this agreement had a very significant effect on the Israeli-Arab conflict, far beyond Israel and Egypt. It ended de facto the phase of the wide conflict, which involved conventional warfare and was very costly. As part II of the book shows, the 10 years that followed the agreement and its implementation were years of significant reduction of military expenditures in Israel. This reduction applied to the military

industries as well, and especially to their research and development (R&D) departments.[2] These include TA'AS, which produces land weaponry and ammunition; Rafael, which primarily produces missiles; and Israel Aircraft Industries, which produces and upgrades aircraft. As part of these cuts in military R&D, in 1987 Israel stopped its Lavi project, aimed at producing an Israeli sophisticated fighter jet.

These cuts in the army and in military industries sent home many skilled workers, scientists, engineers, and computer experts. This group of relatively young professionals re-entered the labor market and looked for something else to do. Although they had lost their previous jobs, they received generous compensations, so they were not in a hurry to catch the first job they found. Hence, many began to develop independent business initiatives, using their high skills and the experience they had gained in the army and in the military industries. This is how the Israeli high-tech sector began.

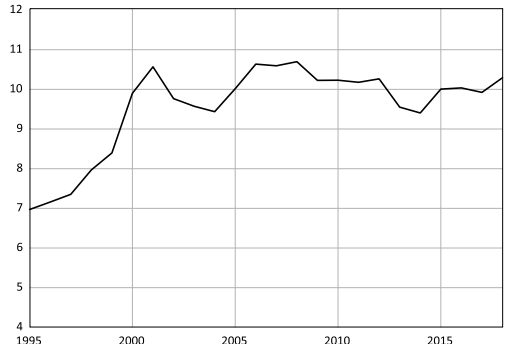

FIGURE 4.1. Employees in the high-tech sector, 1995–2018 (percent of total employees).
Data for 1995–1999 are directly from the Central Bureau of Statistics. The rest of the data are from Central Bureau of Statistics (2005, table 12.12; 2010, table 12.32; 2016, 12.32 and 2019, table 17.9). I have corrected the total number of employees after 2011 to be consistent with earlier data.

According to the classification of the Israeli Central Bureau of Statistics, the high-tech sector consists of the following eight sub-sectors. The manufacturing sub-sectors are: (1) pharmaceutical products; (2) computer, electronic, and optical products, and (3) air and spacecraft machinery. The service sub-sectors are: (1) telecommunications, (2) computer programming, (3) data processing (including web portals), (4) R&D centers, and (5) R&D in engineering and natural sciences. Figure 4.1 presents the share of employees in these sectors relative to total employees in Israel for the years 1995–2018.

Figure 4.1 shows that the rise of the high-tech sector took place mainly during the 1990s, and it had already reached a stable level in 2000. Since then, this sector accounts for around 10 percent of Israeli employees. There is much debate in Israel nowadays about whether the high-tech sector can increase, as there is no doubt that it creates high income and pays good salaries. According to Brand (2018), wages in the high-tech sector are twice as high as average wages in the other sectors in Israel, and this ratio is the highest among the developed countries. This disparity raises the question of whether wages are higher in this sector because it is so productive or because of an insufficient supply of professional workers.

Of the various sectors included in high-tech, the largest is computer programming, which employed 41 percent of the employees in high-tech in 2018. The second is manufacture of computers, which employed 25 percent, and the third is R&D in engineering and sciences, which

employed 10.5 percent. Together these three sub-sectors employed about three-fourths of the employees in high-tech in 2018. The high-tech sector clearly employs people with high education and in most times people with tertiary education in engineering, computer sciences and similar areas. Hence, a large part of the high productivity of the high-tech sector is due to the high human capital of those who work in this sector.

The high-tech sector in Israel is very large in international comparisons, with 8.6 percent of the country's total employment in 2018.[3] The only country with a larger high-tech sector is the United States, with 10 percent of US employment in high-tech in 2016, according to Roberts and Wolf (2018). However, all European countries had smaller high-tech sectors in 2018. The largest after Israel was Ireland, with 8.1 percent of its employees in high-tech, followed by Switzerland with 6.3 percent. East European countries have small high-tech sectors for obvious reasons, but some West European countries have small high-tech sectors as well. In 2018 the share of high-tech employment in Italy was only 3.5 percent, in the Netherlands it was only 3.9 percent, in France it was 4.1 percent, and in Germany it was 4.2 percent.[4]

The most dynamic and successful part of the high-tech sector in Israel is R&D. In 2017, employment in R&D was 32.8 percent of employment in the high-tech sector in general.[5] Part of R&D takes place in universities, which conduct mainly basic scientific research but also some applied R&D. Existing companies conduct another part of R&D, but a large part is done by a multitude of start-ups, for which Israel has become famous. To study better the R&D activity in Israel over time, figure 4.2 describes national expenditures on R&D, according to the two main performers, the business sector and universities. The government and some private nonprofit nongovernmental organizations (NGOs) also perform some research, but their share of it is very small.[6]

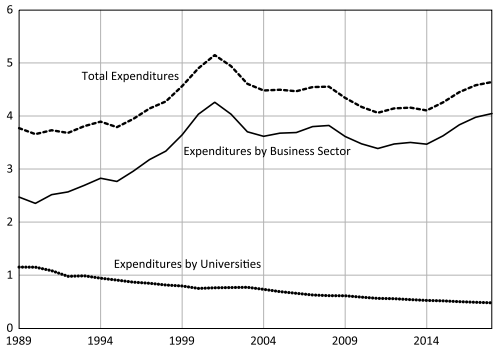

FIGURE 4.2. National expenditure on R&D, 1989–2018 (percent of GDP).
Data are from Central Bureau of Statistics (2019, table 17.1).

There are three important issues to consider with respect to figure 4.2. First, it measures R&D expenditures in percentage of GDP, as economists measure all national expenditures, so that the numbers are comparable over time. Second, these are civilian R&D expenditures; while military expenditures on R&D are significant, there are no data available on them. Third, the government supports R&D of both universities and businesses. The support to universities is mainly through the education budget, as all universities in Israel are public, and through competitive funds to academic research. The government also supports business R&D through a system previously called the "Chief Scientist," and since 2016 called the "Israel Innovation Authority." It allocates funds to R&D projects, which finance up to half of each approved project. If the project

succeeds, it returns the funds with some interest; if it fails, it returns nothing. The government also supported, through its Yozma project that began in the early 1990s, the development of venture capital funds, which play a very important role in financing the high-tech sector.

Figure 4.2 shows a rise in overall expenditures on R&D in Israel, from around 3.7 to around 4.5 percent of GDP. This is a very high level in international comparison and is actually the highest in the world, with only South Korea spending as close a share of GDP. The largest increase was in R&D in the business sector, from 2.4 percent to more than 4 percent of GDP. Over the same period, expenditures on R&D in universities declined relative to GDP. The increase of R&D in the business sector reflects the rise of the high-tech sector.

As mentioned above, much of business R&D is conducted by start-ups, namely, small businesses dedicated to developing a single innovation. Such start-ups usually have a short life cycle. They begin with some early finance by investors (called “seed” or “pre-seed” funding); develop rather fast; and if they do well, they raise additional finance. Once they succeed and reach maturity, they usually sell themselves to a larger firm, mainly in the United States, in an act called “exit.” In 2018, there were 6,616 start-ups in Israel. Most of these businesses were quite small, with 55 percent having between one and ten employees and 30 percent between eleven and fifty employees. Hence, 85 percent of the start-ups in 2018 had fewer than fifty-one employees.[7]

The financing of start-ups in 2018 reached $6 billion, which amounts to $674 per capita, twice as much as in the United States ($303 per capita). However, most of these funds reach the start-ups at later stages of development, while at the seed stage, they receive only 7 percent of total funding. There are 430 permanent professional investors in Israel, of which 23 percent are non-Israeli. Most investment deals have more than one investor, and we do not know the relative contributions of each. However, 60 percent of the deals have Israeli investors, and 43 percent have US investors, while the next most-common home country of professional investors, the United Kingdom, was involved in only 7 percent of the deals. A similar analysis of types of investors shows that most of them are venture capital funds, but a significant share of investment comes from multinational corporations.

Most of the start-ups develop products for other businesses and not directly for consumers. There are two main reasons for that. One is that the Israeli consumption market is small relative to global markets, and the second is the recently growing dominance of the tech giants (such as Microsoft, Google, Apple, and Amazon) in consumer markets. Hence, most start-ups end with an exit. In 2014–2018, the average annual number of exits was more than ninety, and the average total annual value of these exits was $5.4 billion. US companies were the largest acquirers of these exits, accounting for 49 percent of them in 2018; Israeli companies were next, with 30 percent of 2018 exits; and China, the Netherlands, and the United Kingdom followed with 4 percent for each country.

Israeli high-tech companies specialized initially in areas close to their military background, like storage and deciphering, but today they are much more diverse. According to Korbet (2019), the main areas of operation are cybersecurity, health care, financial services, transportation, and agriculture. Israel has become one of the global leaders in cybersecurity, with almost 20 percent of global investment by venture capital funds in this area. Despite their leading role, the start-ups are not the only players in the high-tech sector. High human capital attracts multinational corporations to open research centers in the country. IBM opened its first research center in Israel in 1972, and it is now the largest such center outside the United States. Intel opened its

first extension in Israel in 1974 and later opened more centers there. Today 320 multinationals are engaged in R&D in Israel, of which 246 are from the United States. This activity adds to the importance of the high-tech sector in the Israeli economy.

The High-Tech Sector: A Miracle or Public Education?

The rise of the high-tech sector in Israel triggered the publication of the Senor and Singer (2009) book, *Start-Up Nation: The Story of Israel's Economic Miracle*. The book gained popularity, and it both reflects and affects the opinions of many observers on the issue, focusing on two main claims. The first is that the success of the Israeli high-tech sector is unique due to the special characteristics of Israelis, who are highly creative, talented, and unruly as well, having chutzpah. These personality traits, strengthened also by the military service, enabled them to create such a strong and vibrant industry. The second claim is that the rise of the high-tech sector has been crucial for Israel's economic success in recent decades and for its continuing economic growth. This section examines these two claims.

It is hard to find international comparative data on productivity of the total high-tech sectors, but there are data on productivity of a large segment of this sector, namely, ICT. This sector employs 68 percent of the total high-tech employees in Israel (it does not include pharmaceuticals, for example).[8] Central Bureau of Statistics (2019) presents international comparative data on relative employment and relative output in ICT sectors across OECD countries.[9] According to this data set, output per worker in ICT sectors, relative to total output per worker in the country, is on average 1.8. In Israel, this ratio is equal to 1.43. Since total output per worker in Israel is lower than in most developed countries, as shown below in a later section in this chapter, productivity of the ICT sector in Israel is clearly lower than in most OECD countries. It is especially low compared to that in the United States, where ICT productivity is 1.94 of average labor productivity.

Thus the Israeli high-tech sector is strong and prominent not due to its productivity, which is somewhat lower than in other countries, but because of its large scale. The Israeli sector's scale has several possible explanations. One is the high level of education in Israel, with more graduates of tertiary education than in most OECD countries. The size of this group in Israel was 28.6 percent of the population older than 25 years in 2010, which was third highest in OECD countries, after only the United States (30.9 percent) and Ireland (30.1 percent).[10]

Another reason for the large size of the high-tech sector in Israel is the support it receives from the public sector, both directly and indirectly. The direct support includes governmental subsidies to business R&D and support to venture capital funds (such as Yozma). The indirect support stems from the military service of many young Israelis in high-tech units, during which they acquire significant knowledge and experience, which enables them to move easily to the civilian high-tech sector. Importantly, they do not serve many years in these units, unlike professional armies elsewhere. The reason is that the Israeli Defense Forces prefer to recruit to these units the best talents in each cohort, at the cost of a relatively short service, so that the number of conscripts who pass in through these units is high. This analysis implies that the Senor and Singer (2009) claim about the uniqueness of Israelis does not fit the data well. The Israeli high-tech sector is not more productive than similar sectors elsewhere, but it is larger. This is due mainly to the achievements of public education in Israel (already discussed in chapter 3) and to high subsidies to this sector, direct and indirect.

We next turn to the contribution of the high-tech sector to the overall Israeli economy. Many economists, most prominently Eugene Kandel, CEO of "Start-Up Nation Central," claim that the economy is actually split between an advanced part (mainly the high-tech sector) and a backward rest of the economy. I think that this dichotomy is somewhat exaggerated. Every modern economy has different sectors with different levels of technology, but they are strongly connected. The high-tech sector would not have thrived without the great achievements of the Israeli public system of education, not only in mathematics and engineering but also in general. The high-tech sector also flourishes because its workers live in Israeli cities and towns they like, eat in good restaurants, and visit cultural events they cherish.

It is also important to keep in mind that not all R&D in Israel is in the areas of computers and the Internet. One of the important developments in Israel has been the reverse osmosis method of desalination, developed by Sidney Loeb from Ben-Gurion University with a co-researcher from the University of California, Los Angeles. Their work was first applied in a small desalination plant in Eilat in 1968, and since then it has expanded both in Israel and abroad. Currently Israel has four major desalination plants along the Mediterranean, which produce around 500 million cubic meters of fresh water, which is a quarter of the water consumption in Israel. This technology is highly important in a relatively dry and densely populated country. Other important R&D in Israel is in the area of agriculture, which also contributes to its economic success in a country that lacks water.

It is important to try to assess the effect of the high-tech sector on economic growth in Israel. It is hard to analyze such an effect statistically, as economists like to do, since it is not a collection of events but a single process. However, we can make two observations. First, although the high-tech sector has higher labor productivity than the aggregate economy, it did not have a significant observed effect on economic growth in Israel. GDP per capita grew at an average annual rate of 1.7 percent after 1973 and its rate of growth was similar before and after the 1990s, when the high-tech sector became significant. Actually, a later section in this chapter shows that the rate of growth of labor productivity after the 1990s was even lower than before. Furthermore, the growth of the high-tech sector already captures the high contribution of education to growth, as shown in chapter 3.

However, the lack of observable effect of high-tech on growth does not mean that Israel would have grown at the same high rates without the high-tech sector. To begin to examine this possibility, it is useful to compare Israel to two other countries, Italy and France, who for various reasons did not develop a large high-tech sector. While Israel had 8.6 percent of its employment in 2018 in the high-tech sector, Italy had only 3.5 percent and France only 4.1 percent. Figure 4.3 presents GDP per hour in the three countries, Israel (solid curve), Italy (dashed curve), and France (dotted curve).

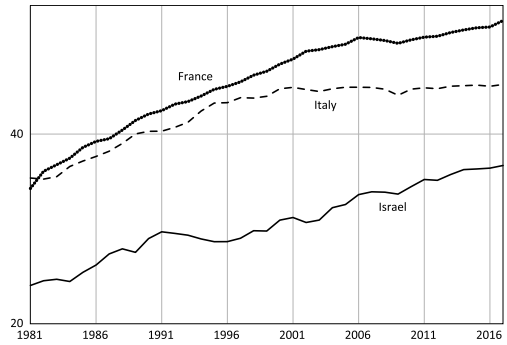

FIGURE 4.3. GDP per hour in Israel, Italy, and France, 1981–2017 (in 2010 dollars). Data are from OECD (2019a), accessed on November 8, 2019. The logarithmic scale is 2.

Figure 4.3 shows that from 2000, labor productivity (GDP per hour) in Italy has not grown at all.[11] In the same period, output per hour in Israel increased by 22.2 percent. In France, labor productivity increased since 2000 by 17.3 percent, but the difference with Israel is due to the Great Recession that began after the financial crisis in 2008.[12] In 1995–2007, years of intense high-tech activity in Israel, labor productivity in Israel grew by 20 percent, while in France it grew, very similarly, by 20.3 percent. Thus, this comparison between the three countries yields mixed results. Italy fared much worse than Israel, and this could be in part due to insufficient high-tech in Italy. However, France also had a much smaller high-tech sector, but it succeeded in growing as fast as Israel, except for the years of the global financial crisis, for reasons that have nothing to do with its high-tech activity. Hence, this international comparison still leaves this counterfactual question without a definite answer: How would Israel have grown without the high-tech sector? It could have stopped growing like Italy did or kept growing like France did.

Another way to view the economic role of the high-tech sector in Israel is through its relation to the global division of production. Until the early 1980s, the West specialized in manufacturing. After that, the United States gradually specialized in global services, which are mainly ICT, financial services, business services, and education. While some Western countries kept their specialization in manufacturing, the United States moved further into global services, and some other countries moved with it, like the United Kingdom, Ireland, and Israel.[13] The Israeli high-tech sector enabled it to become part of this new specialization in global services. This allowed Israel to supply productive jobs to its growing group of highly educated workers and to avoid the problem of misallocation in labor markets, which some countries face.

Discovering Gas in the Mediterranean

Israel is located in the Middle East, home to many oil and gas deposits, which have made countries in the Persian Gulf very rich. For many years Israel was exceptional in the Middle East not only by being a country of immigrants and not natives, by having a large ex-European population, and by having a different religion from the Muslim countries, but also by not having large energy deposits. After several unsuccessful efforts to find oil, in a location called “Heletz,” Israelis viewed this lack of energy sources as another proof of their economic ingenuity. They said, “We succeeded to grow fast, despite the fact that we do not have many natural resources.” For a short period, Israel used an Egyptian oil field in the Sinai Peninsula that it occupied in 1967 and pumped oil out of this field until the area was returned to Egypt in the Disengagement

Agreement of 1975.

Things changed dramatically in 1999, when Israeli companies found gas in the territorial water of Israel in the Mediterranean. That began a period of intense search and the discovery of more gas fields. The first was “Noa,” which has already been depleted. The second was “Tamar,” which was very large. Then came a few smaller fields, followed by a very large field called “Leviathan.” Current estimates of the gas in the two main fields are around 200 billion cubic meters in Tamar and 450 billion cubic meters in Leviathan. The main use of the gas is for the production of electricity in Israel, and it accounts for 70 percent of this production. Recently Israel began to export gas to Jordan, and it plans to begin to export gas to Egypt as well. This is somewhat ironic, since before 2011, Israel imported gas from Egypt.

Production of gas in the two main fields, Tamar and Leviathan, is by a consortium of Israeli companies (mainly Delek Energy) together with a US company (Noble Energy). The control of this consortium of such a large part of the market for natural gas in Israel amounts to a monopoly, and the government had to allow it in a special resolution in 2015. This led to a large controversy, and caused, among other things, the resignation of the head of the Israeli Anti-Trust Authority, David Gilo. Since the production of gas is a natural resource and it is possible by a government license, there was considerable public pressure to tax the producers of gas significantly. A special committee, headed by the economist Eytan Sheshinski, indeed recommended, and the government accepted, that the gas producers should pay an additional tax after they cover their initial investment cost plus an accumulated return of 50 percent. The government promised to invest receipts from this tax in a fund and use only the income from the fund. By 2020, the gas producers have not begun to pay this tax.

Since we are dealing in this part of the book with Israel’s economic growth, we next describe how the discovery and use of gas increase output in Israel. Natural gas is used to generate electricity, and therefore it does not increase the amount of final products in Israel, as long as it is not exported. However, the gas replaces imports of energy to Israel, mainly oil and coal. Importing less inputs increases GDP, which is the sum of all final goods minus imported inputs. The Tamar field began to operate commercially in 2013. In the years 2010–2014, energy imports to Israel were on average 5.3 percent of GDP. Then there is a sharp decline in 2015, caused by decline in the import of coal due to greater use of natural gas. In the years 2015–2018, the average imports of energy were 2.3 percent of GDP.[14] Hence, there is a decrease in imports of energy amounting to 3 percent of GDP, which implies that this is approximately the value of the gas produced in Israel.

Hence, we can learn from this back-of-the-envelope calculation that the new gas increased the level of GDP by 3 percent. This calculation also shows that the overall contribution to the economy, even if the Leviathan field would operate fully, cannot be too big. Even if gas were to produce all the electricity in Israel, its contribution to output would be 4.3 percent of GDP at most. However, it is important to keep in mind that production of gas carries not only large economic benefits but is also significant politically as well, as it reduces the dependence of Israel on other countries. In addition, we need to keep in mind what economists call the “resource curse,” namely, that discovery of new energy resources tends to affect economic growth negatively.[15]

High Fertility in Israel

Population in Israel is growing fast not only due to immigration but also because of high fertility. During 2003–2018, when no mass immigration took place, population in Israel still grew at an average rate of 1.9 percent annually. The rate of fertility in Israel, which is the average number of births during a woman's lifetime, is 3.1. It is the highest in the OECD, where the average rate is 1.7. It is higher than in India (2.3), South Africa (2.4), and even Saudi Arabia (2.3). There are only 60 countries with higher fertility rates than Israel, all of them poor countries and most of them in Africa.[16] Israel has therefore a uniquely high rate of fertility among the high-income countries and even among the middle-income countries. Israel also differs in the stability of its fertility rate over the past two decades, while fertility has declined in all other countries.

The high rate of fertility has several effects on the Israeli economy. First, it increases significantly population density in the country, which reached 394 people per square kilometer in 2018. Only two OECD countries are denser, South Korea (500 people per square kilometer) and the Netherlands (410). However, Israel is actually much denser, since the south of the country is a desert and is sparsely populated. The region of Be'er Sheva occupies more than half of the area of the country, and its population density is only 58 people per square kilometer. Population density excluding this region is actually 893 people per square kilometer.[17] The Central Bureau of Statistics estimates that due to high fertility, the population of Israel will reach 25 million by 2065.[18] Hence, the density by that year will be around 2,500 people per square kilometer.

The high population density in Israel already causes significant traffic congestion. In 2014, Israel had a traffic intensity per network length of 2,800, compared with an average of 800 in the OECD countries.[19] The congestion is extremely acute due to the geography of the country, which has a very large center in Tel-Aviv and its vicinity (called "Gush Dan"). This center supplies services to the whole country, and the roads that lead to and from it are heavily congested. The high traffic volume causes loss of productive time spent in traffic, which reduces GDP and human welfare. The risk of high population density alarms many experts in Israel. Some have formed a new think tank, called "Tsafuf" ("Dense"), which has published a study on the issue (Trajtenberg et al. 2018). However, overcrowded roads in Israel are not only because of high population density but also due to low investment in public transportation, as discussed in chapter 12.

The second economic effect of high population growth is on the housing market, which requires high investment on a permanent basis to cope with the growing population. This is one of the main explanations of the very high prices of housing in Israel. Since investment in housing (as any investment in general) has increasing marginal costs, a higher rate of increase of housing should be more costly, as the price reflects the marginal cost. However, the blame for high housing prices lies not only on rapid population growth, but also on the small amount of public housing supplied by the government, as discussed in chapter 12. Note that the housing market causes an additional trouble, due to high density of population, as housing exhausts open areas and causes significant harm to the environment.

Despite these negative economic effects of high fertility in Israel on transportation, environment, and housing, it also has a few positive effects. One is that the high rate of population growth boosts aggregate demand in the country, due to housing construction and larger investment in creating jobs every year. This increases aggregate demand and reduces the chance for recessions; and even if one occurs, high population growth helps make it shorter. We further discuss this effect in chapter 7, on business cycles in Israel. Another positive effect of high population growth is that there are relatively fewer old people in the population, which

reduces the costs of health care and more generally, those of care for the elderly. However, having more children raises the costs of education and of childcare, so the overall effect on the public sector is ambiguous. For a more detailed analysis, see Trajtenberg et al. (2018).

Why is fertility so uniquely high in Israel? This is a puzzle, since Israel is a high-income country that values education. As investment in education is costly, parents should have fewer children. In addition, most women in Israel work, which should also reduce fertility, due to the high opportunity cost of raising children. Despite these two economic considerations, which apply in other Western countries, fertility in Israel is much higher than in those countries. For years, experts thought that a major reason for the high fertility was the Arab population, which makes up 20 percent of the population and used to have high fertility. However, the fertility rates of Arab women have declined persistently. In 2018, they reached 3.2 for Muslim women, 2.06 for Arab Christian women, and 2.16 for Druze women.[20] Hence, high fertility is due to the Jewish population.

One reason for high fertility is religiosity. The Jewish Ultra-Orthodox community, which constitutes around 10–15 percent of the population of Israel, has a very high fertility rate of 7. The fertility rate of religious women who are not Ultra-Orthodox is higher than 4, and that of less religious women, who define themselves as traditional, is 3. However, even self-described secular nonreligious women have an average rate of fertility of 2.1.[21] Hence, religiosity partly explains the puzzle of high fertility in Israel, but it is definitely not the full explanation.

Another cause for high fertility could be the conflict, under which Israelis have lived for many years. The conflict implies risk of death or severe injury at a young age in military activity, which raises the will to have an extra child. The sociologist and demographer Goldscheider writes: “It may reflect what demographers have referred to as an ‘insurance’ effect, motivated by Israel’s flow of military casualties.”[22] Actually, we can broaden this argument and suggest that life in a conflict, surrounded by hostility, led to a national ethos that encourages population growth, as part of the Zionist ethos of building a national home for the Jewish people. Indeed, over the years Israel has implemented many policies that encourage fertility, such as living subsidies for children and free fertility treatments, which are the most generous in the world, and much more. Furthermore, due to the small size of the country, parents live close to their children and help them with childcare, which enables working parents to have more children. DellaPergola (2009) finds that having children is a strong part of the beliefs of Israelis from all parts of society. He also reports that most Israeli Jews, including those who are secular, would like to have more children, where three is the average goal.

The issue of high fertility clearly deserves more research. However, this topic does not appear high on the public discourse in Israel. It is rare to hear voices who call for a reduction of fertility, although the high birth rate clearly causes serious economic problems in Israel. There is a sense that its discussion is taboo. This also supports the above-mentioned claim that high fertility is a strong part of the Israeli-Jewish ethos.

Why Is Labor Productivity in Israel So Low?

One of the most intense discussions among Israeli economists in recent decades is on the low labor productivity, which many view as the greatest economic problem of Israel. To understand this issue, remember the discussion in chapter 2, which describes Israeli economic growth in 1922–1972 as catching up with the developed countries. However, Israel did not fully catch up.

Although it has grown at a similar rate as the developed countries after 1973, it still has a lower level of output per worker. Some economists, like Ben-David (2013), even argue that output per worker in Israel is not only lower than in the developed countries but is also growing at a lower rate. The explanations for the low productivity range from the low quality of Israeli education to excess regulation and bureaucracy. This section offers somewhat different explanations.

Table 4.1 presents levels of output per hour in Israel and in some leading countries, in 2010 dollars, according to the OECD. Table 4.1 also presents the average rates of growth during the entire period, 1981–2017.[23] It then presents the average growth rate during a shorter period, 1996–2017. The reason for focusing on 1996–2017 is to neutralize the sharp decline in labor productivity growth in 1993, as shown below.

Table 4.1 shows that indeed, labor productivity is lower in Israel than in the developed countries by about 40 percent. It is lower than in the United States by 44 percent, in France and Germany by 40 percent, in the United Kingdom by 32 percent, and in the G7 by 37 percent.[24] During the longer period of 1981–2017, Ben-David seems to be right, and labor productivity in Israel grew more slowly than in the advanced economies. However, if we examine the shorter period from 1996, Ben-David's claim does not hold, as only labor productivity in the United States grew faster than in Israel.

TABLE 4.1. Labor productivity in Israel, United States, United Kingdom, France, Germany, and G7, 1981–2017

Country	Israel	United States	United Kingdom	France	Germany	G7
Labor productivity, output per hour in 2017 (2010 dollars)	35.7	64.2	52.5	60.6	60.5	56.5
Average growth rate of labor productivity in 1981–2017 (percent)	1.23	1.56	1.62	1.72	1.72	1.70
Average growth rate of labor productivity in 1996–2017 (percent)	1.34	1.64	1.28	1.15	1.22	1.42

Source: Data are from OECD (2019a), accessed on November 8, 2019.

But examination of total GDP per worker is misleading, and we should focus instead on labor productivity of the business sector. The difference between total and business output includes public production and an estimate of housing services. Since public services do not exchange in markets, their value reflects only costs of production and not productivity, so they bias the measure of productivity. Housing services can also bias this measure, as they might reflect various aspects of the housing market rather than productivity.

To correct for these two problems, we next compare output of the business sector per worker, rather than total output per worker. Thus, figure 4.4 compares business GDP per hour in Israel and in the United States. Since PPP data exist only for total output, this comparison is not PPP adjusted. However, according to Penn World Tables, the PPP multipliers of the two countries are very close to 1, so the comparison makes sense.[25]

Figure 4.4 shows that indeed, labor productivity in Israel has been significantly lower than in the United States, even after the end of catching up in 1973. However, the concern over low rates of growth of Israel's labor productivity is exaggerated. Since 1973, it grew at an average annual rate of 1.77 percent, while the US average growth rate of business output per hour in 1973–2018 was 1.82 percent. This difference is quite small. Hence, while in 1973, Israeli business labor productivity was 57.3 percent of that of the United States, in 2018 it was 56.0 percent of it. This is not a large decline. The concern over low growth of Israeli labor productivity is even smaller when compared with the EU countries. According to Gordon and Sayed (2019), labor

productivity of business sectors in EU-10 countries grew in 1973–2015 at an average rate of 1.82 percent, while in Israel it grew at an average rate of 1.8 percent. In 1996–2015, labor productivity of business sectors in EU-10 countries grew by 1.18 percent annually, while in Israel it grew at 1.92 percent.[26]

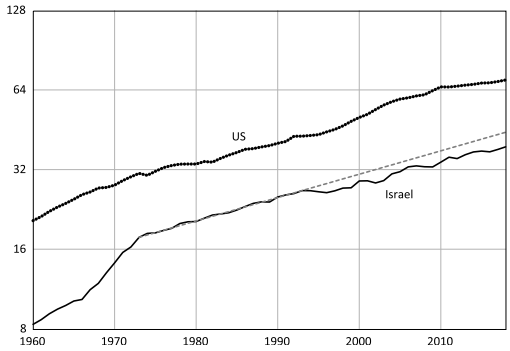

FIGURE 4.4. Business sector output per hour in Israel and the United States, 1960–2018 (in 2015 dollars).
Data for Israel are from Bank of Israel (2019c, tables 2.A.10 and 2.A.114). Data for the United States are from Bureau of Labor Statistics (BLS) website, https://www.bls.gov/lpc/#tables, accessed on July 16, 2019.

Interestingly, figure 4.4 shows that business output per hour in Israel grew faster in 1972–1992, at an average rate of growth of 2.05 percent. Business output per hour in the United States in these years grew at an average lower rate of 1.63 percent. The dashed straight line in figure 4.4 shows how labor productivity in Israel would have grown if it had maintained its pre-1993 growth rate. In that case, Israeli business labor productivity would have been 63.5 percent of that in the United States in 2018. This raises the question what caused the decline in the growth of labor productivity in the business sector after 1993.

The most plausible explanation for this decline after 1993 is the entry of immigrants to the labor market. The immigration from the former Soviet Union to Israel began in 1990. In 1993 immigrants entered the labor market in large numbers.[27] Like all immigrants around the world, they suffered from the Kuznets effect, described in chapter 3, and lost on average more than half of their human capital in the new country. Hence, although most of these immigrants were highly educated, their actual average productivity in the new labor market was lower than that of veteran Israelis. This reduced the average labor productivity in the economy. Chapter 13 shows that the productivity of the immigrants did not fully recover even by 2011, some 20 years after the beginning of the immigration wave.

Hence, one explanation for the gap in labor productivity between Israel and the United States is the immigration from the former Soviet Union, which eroded the human capital of the immigrants and hence reduced the average human capital in the economy in the following years. Without this effect, the gap between labor productivity in Israel and the United States would have declined from 44 percent to 36.5 percent. The public discourse on labor productivity might be disappointed with this explanation, as it does not call for any policy intervention. The immigrants themselves suffered from the Kuznets effect, and in any case, they are now on their way to retirement, so we can expect this part of the gap in labor productivity to diminish over time.

Let us turn next to another explanation for the low labor productivity in Israel, which is much more significant. Figure 4.5 compares the capital-output ratios in the business sectors in Israel

and in the United States. Since the early 1970s, the capital-output ratio in Israel was around 1.0, while in the United States it was around 1.6. Such a gap in capital can cause a large gap in output, even if the two economies have similar total factor productivities. Since capital is a major factor of production, reducing capital reduces output as well. Appendix 3 shows that if the capital-output ratio in the United States is 1.6, while in Israel it is 1.0, then US labor productivity should be higher by 26 percent than in Israel, or output per hour in Israel should be 21 percent lower than in the United States. Hence, out of the 44 percent gap between the two countries, 7.5 percentage points are due to low productivity of immigrants and 21 percentage points are due to low capital. Together these differences explain a gap of 28.5 percentage points out of 44, namely, two-thirds of the gap.

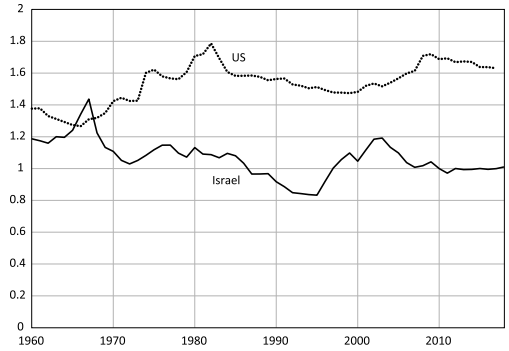

FIGURE 4.5. Capital-output ratios in business sectors in Israel and the United States, 1960–2018.
Data for Israel are from Bank of Israel (2019c, tables 2.A.10 and 2.A.12). Data for the United States are from Bureau of Economic Analysis website, https://apps.bea.gov/national/FA2004/Details/Index.htm, Fixed Asset Account Tables, table 2.1, accessed on July 23, 2019.

This leaves us with the question of why there is much less capital in Israel compared with the United States. Appendix 3 shows that the only explanation is that the cost of capital in Israel is much higher than in the United States. As explained in chapter 3, when producers determine how much to invest, they consider how much each additional dollar will increase their future profits on the one hand, and how much it will increase their future costs on the other hand. The annual future cost of each dollar is the interest paid to finance it, plus the annual depreciation rate of capital, plus the risk premium on investment. The large gap between in the capital output ratios between Israel and the United States is because investors face different costs of capital in the two countries.[28]

However, both Israel and the United States face the same interest rates, as both are open to capital mobility and can borrow at the global rates. Both countries face a similar rate of depreciation, which is a global technological parameter.[29] Hence, if their capital output ratio differs so much, it is due to very different risk premiums in the two countries. Appendix 3 performs a back-of-the-envelope calculation of the implied risk premium in each country and finds that it is 8 percentage points in the United States and 21 percentage points in Israel.

Why then is Israel so much more risky than the United States? We cannot study this issue statistically, as the gap in risk premiums exists over many years. However, we can make a reasonable guess that the higher risk in Israel is due to the Israeli-Arab conflict. Relating the risk to the conflict is a hypothesis, but it receives some support from figure 4.5. The capital-output ratio in Israel declined from around 1.2 before 1967 to 1.0 after 1967, which implies that

investors' risk premium increased from 16 percentage points before 1967 to 21 thereafter. This rise in risk fits well the intensification of the conflict after 1967, as described in chapter 1. Interestingly, more support for this hypothesis hides in the dynamics of the US capital-output ratio. It increased from 1.4 in the 1960s to 1.6 in 1974 and thereafter. This could have been the result of the end of the Vietnam War at around that time.

Therefore, we can conclude that the Israeli-Arab conflict apparently has had a significant effect on the level of output per worker and per capita. Hence, the main explanations I give here for the low productivity of Israel are very different from those raised in the public debate on labor productivity, such as low quality of education, excess regulation, and excess bureaucracy.[30] While these factors can explain some part of the gap in productivity with other developed countries, it is only a small part. The main gap is due to two causes. One is the decline of productivity of immigrants due to the Kuznets effect, and the second is high risk due to the Israeli-Arab conflict.

The Good News and the Bad News

This chapter discusses some additional economic issues related to economic growth of Israel. These issues add more color to the simple picture that chapters 2 and 3 paint. Some are bright colors and others a bit darker. Clearly, the brightest colors belong to a highly successful high-tech sector, which began to expand in 1990 and reached its current relative size in 2000. It is hard to evaluate the effect of the high-tech sector on Israel's economic growth, as there is no sign that Israel's growth accelerated with the rise of this sector. Actually, figure 4.4 shows a decline in growth of business output per hour after 1993, although we attribute this decline to another factor. However, we should examine the counterfactual and ask whether Israel might have experienced a decline in economic growth without the high-tech sector. The high-tech sector is important, since it enabled Israel to find suitable employment for its growing educated labor force, and it enabled Israel to join the United States in producing global services. In other words, it did not make Israel run faster, but it helped Israel to stay on course.

Another positive contribution to economic growth was the discovery and production of gas in the Mediterranean, which began in 2013 and increased the level of output by 3 percent. This addition is significant, even if it is not too big. However, this chapter also discusses two issues that are less bright. One is the fertility rate in Israel, which is the highest among developed countries and is similar to those in some poor developing countries. This high fertility rate carries with it some serious economic challenges. One is the high population density, which leads to transportation congestion and might even reduce productivity. The second is pressure on the housing market, and the third is a burden on the education system. It is less clear what causes fertility, but we discussed the possible relations to religiosity and to the Israeli-Arab conflict.

The second problematic issue, which is much more serious, is the fact that Israel did not fully catch up with the advanced countries, and its labor productivity is still lower by more than 40 percent from that of the United States. This chapter does not explain the entire gap but presents two explanations that together account for two-thirds of the gap with the United States and for even more than two-thirds of the gap with other developed countries. One explanation is the decline of human capital of the immigrants, who arrived from the ex-Soviet countries in the 1990s, a decline that lasted a long time after immigration. The second explanation is that capital is low in Israel, due to a high risk premium, caused by the Israeli-Arab conflict.

This explanation for low labor productivity in Israel leads us straight to the second part of the book, which deals with the Israeli-Arab conflict. This chapter finds a very high cost of the conflict, which is a loss of potential output that is equal to 26 percent of output in the business sector. If we assume that the public sector also shares similar underinvestment in capital, then this cost of the conflict can reach 26 percent of GDP. Part II of the book expands the picture and analyzes additional economic costs of the conflict.

1. See Senor and Singer (2009).
2. The military industries in Israel were not private, as in the United States, but governmental. Only recently has the government begun the process of gradual privatization of these industries.
3. The percentage in figure 4.1 is higher, at 10.3, since it is adjusted to fit previous data, which do not include conscripts. However, 8.6 percent fits international standards, so it fits an international comparison as well.
4. see Central Bureau of Statistics (2019), table 17.11.
5. See Central Bureau of Statistics (2019), tables 17.5 and 17.9.
6. The government and these organizations account for less than 1 percent of total R&D expenditures.
7. The information here and in the following paragraphs is from Korbet (2019).
8. See Central Bureau of Statistics (2019), tables 17.9 and 17.17.
9. See Central Bureau of Statistics (2019), table 17.18. The source of the data is the OECD.
10. According to Barro and Lee (2020).
11. Cumulative growth of 1.6 percent over the 17 years.
12. This recession was mild in Israel, due to reasons other than high-tech. See chapter 7.
13. The share of manufacturing in US employment declined from 32 percent in 1948 to 9 percent in 2018. The share of employment in 'global services' increased from 7.7 percent in 1948 to 22.4 percent in 2018. Data are from BLS.
14. The figures on imports of energy are from Central Bureau of Statistics (2012), table 16.10; Central Bureau of Statistics (2013), table 16.10; Central Bureau of Statistics (2015), table 16.10; Central Bureau of Statistics (2017), table 16.10; and Central Bureau of Statistics (2019), table 13.10.
15. See chapter 2 for such an effect on Saudi Arabia.
16. Data from World Bank, https://data.worldbank.org/indicator/SP.DYN.TFRT.IN, accessed December 31, 2020.
17. The calculation of these figures is based on Central Bureau of Statistics (2019), tables 1.1 and 2.15.
18. See Central Bureau of Statistics (2019), table 2.10.
19. See OECD (2018), figure 2.1.B.
20. See Central Bureau of Statistics (2019), table 2.41.
21. For the data on fertility rates by religios affiliation, see Central Bureau of Statistics (2018b), box 1.1.
22. See Goldscheider (2018), p. 224. The term appeared first in Friedlander and Goldscheider (1978).
23. OECD has gathered data for a longer period (1970–2018), but its data on Israel are limited to 1981–2017.
24. The G7 countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States
25. See Feenstra et al. (2015), PWT version 9.1.
26. The EU-10 countries are Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, and the United Kingdom.
27. You can find data on the absorption of this immigration wave in the labor market both in chapter 7 on business cycles, and in chapter 8 on the balance of payments.
28. The difference cannot be the result of different total factor productivities, because that would reduce both capital and output in the same proportion, and the capital-output ratio would be the same, as appendix 3 shows.
29. More precisely, the rate of depreciation differs across types of capital, and it therefore depends on the composition of capital in a country. But this composition is quite similar across developed economies, and even more so in Israel and the United States, which have a similar composition of industries.
30. See Hazan and Tsur (2021) for a focus on labor productivity and quality of education. Appendix 3 also shows that the effect of regulation and bureaucracy is quite small.

Lessons from Part I

I opened this book with a discussion of the most outstanding economic achievement of Israel, its rapid economic growth. Chapter 2 shows that over the course of 50 years (1922–1972), Israel's GDP per capita grew at an average annual rate of 5 percent. As a result, in these 50 years, Israel developed from a poor province to a developed country, one of the thirty richest countries in the world. This rapid growth is even more impressive, as it occurred while absorbing large immigration waves and while being embroiled in a deadly and at times intense conflict with its neighbors. This achievement is also unique, considering the geographic location of Israel, in a region of poor countries with low output levels and growth rates. How did it happen? And what lessons can other countries draw from this experience?

Chapter 3 shows that similarly to all other countries, economic growth in Israel was driven mainly by growth of total factor productivity. That means the expansion of education and adoption of new technologies. We show that close to half of economic growth has been a result of the increase in human capital. This reflects mainly the rapid expansion of education and in the first two decades of the state, the absorption of immigrants, who arrived in the first years and constituted more than half of the population then. Chapter 3 then shows that in the years of rapid economic growth, Israel eliminated its technological backwardness by adopting technologies that had been invented long before, by taking them "off the shelf." This enabled Israel to increase productivity faster than other developed countries, which must wait for new inventions that come at a slower rate.

However, explaining rapid economic growth by the expansion of education and adoption of older technologies off the shelf leaves us with deeper questions. Why couldn't many other developing countries grow similarly? Why couldn't they expand education and adopt off-the-shelf technologies, as Israel did? What enabled the Jewish Yishuv and the State of Israel to succeed in these two endeavors and embark on a path of rapid growth? It is hard to give full answers to these questions, in part because economic research has not fully solved all the puzzles of economic growth in general. However, we can use what we have learned in part I to supply some answers to these questions.

One reason for Israel's success is the high level of human capital of the Jewish immigrants on their arrival to the country, especially during the Mandatory period.[1] The high human capital of immigrants not only increased productivity but also helped build an impressive education system. Furthermore, high human capital also contributed to the fast adoption of technologies through two main mechanisms. One is that knowledge makes it easier to absorb new technologies and many of the immigrants were highly skilled professionals, such as doctors, engineers, and scientists.[2] The second mechanism is that high human capital raises wages, which encourages adoption of new technologies, since many new technologies are in the form of machines that replace workers.[3]

A second factor that characterized the Zionist enterprise and facilitated rapid economic development was the availability of financing from abroad. Until 1948, the immigrants brought some wealth with them, which financed most of the large investment in the young economy, together with Zionist and Jewish donations. After 1948, when immigrants were poorer, came a new source of foreign finance, the West German reparations in 1953–1965, while donations from world Jewry continued to arrive. After 1970 came the financial aid from the United States. Hence, in its crucial years of catching up, Israel enjoyed large flows of funds from abroad.

This finance was crucial not only because it enabled the young state to carry out large investments. It also helped Israel to adopt technologies, as such adoptions required imports of machines, such as tractors, ships, airplanes, and telephone equipment. In addition, the expansion of public education also required large investments in schools and universities, so it also benefited from the flow of funds from abroad. Furthermore, to increase human capital, it is not sufficient to raise levels of education, as it also requires that the new graduates find adequate jobs that fit their educational attainments. Nowadays many developing countries expand their education systems, but it does not translate into economic growth, as the educated do not find good jobs, due to insufficient investment.

Thus, the key to the success of Israeli growth was the uniqueness of the Jewish immigration. Jews formed a nonterritorial people, which therefore became part of the middle class in the countries they lived in. Thus, Jews had relatively high education and some financial wealth as well. When they immigrated to Palestine, they brought their education and wealth with them and that enabled high economic growth. After the Holocaust, Jewish survivors lost their wealth, but the West German reparations compensated partly for what they had in the past. It was sufficient to continue rapid growth for 20 more years.

In addition to the special characteristics of Jewish immigration, it is important to admit the role of global powers in the development of Israel. The British, who ruled the country for 30 years, were supportive of the Zionist movement, from the Balfour Declaration to almost the end of their rule. That helped economically as well. Once the British left the region, the United States became increasingly involved with Israel. The financial and military support of the United States was small initially, but it grew gradually and became large after 1970, in addition to the political support. This support helped the Israeli economy as well, as described in chapter 6.

Another characteristic of Israel, which helped it to grow fast, was the intense involvement of the public sector in economic growth. The public sector invested in housing projects, the expansion of the electricity system (after nationalizing Israel Electric Corporation in 1953), and the operation of the Dead Sea Works.[4] The public sector also built a new port in Ashdod and laid the famous water carrier from the Sea of Galilee to the south of the country. It encouraged many private entrepreneurs to invest and start businesses in Israel. Behind this high involvement of the public sector stood one main goal: economic growth, in order to supply housing and jobs to the many immigrants. However, this was high-quality and efficient involvement, as the young state succeeded in recruiting to its ranks the best and the brightest. They did it because of their commitment to the Zionist cause, but also because they grew up in a political atmosphere of respect for the public sector and for its vital role in the success of their national movement.

The analysis of economic growth in part I implies that Israel's unique economic growth was not a miracle but a result of the special immigration to the country of people from the middle class. It is also a result of the strategic location of the country and its importance to the West. Hence, other countries might find it hard to imitate the Israeli example of rapid economic

growth. First, access to foreign finance is hard to achieve for most countries. Second, it is also hard to get such highly educated immigrants nowadays.

Although it is hard to imitate Israeli economic growth, we can draw some interesting lessons from it. The first is that human capital is highly important for economic growth and can make a significant difference. However, education is not sufficient, as we need to create adequate jobs for the educated, so they can fully materialize their human capital. Hence, access to financing is crucial for economic growth as well. Another lesson from this story is that in times of catching up, the role of the state in initiating many projects, from public education to infrastructure and more, is vital. For the public sector to perform this job, it needs to recruit highly qualified women and men. This might not succeed in a neoliberal atmosphere, which looks down on the public sector.

1. The level of human capital of immigrants after 1948 was lower. The immigrants from Europe were mostly people caught in World War II at a young age, who missed most of their education years. The immigrants from Arab countries came from countries with lower education in general, and for Jews as well. See Ben-Porath (1986b).

2. An example already mentioned is the immigration of Sidney Loeb, who joined Ben-Gurion University, where he further developed the method of reverse osmosis desalination of water, which he began to develop in the United States.

3. See Zeira (1998) and Acemoglu (2010).

4. For this public involvement, see chapter 11.

PART II

The Israeli-Arab Conflict

The Israeli-Arab conflict followed the growing Jewish presence in the country, especially since the British occupation of Palestine in 1917, as described in chapter 1. Over time, the conflict became more intense, and it is central to life in Israel to this day. People pay close attention to various aspects of the conflict even between—and definitely during—outbreaks. The centrality of the conflict is visible especially in political life in Israel, where it is the main parameter that distinguishes between the various political parties, much more than social or economic issues.

Surprisingly, despite the centrality of the conflict in Israel, its economic effects have received little attention so far. One way to see this is to examine previous books on the Israeli economy. Halevi and Klinov-Malul (1968) devote only a few lines to defense expenditures. Ben-Porath (1986c) was an edited volume by the Falk Institute, devoted to the severe crisis of the 1970s and early 1980s. Only one of the twenty chapters in that book, Berglas (1986), discusses the conflict. In the twenty chapters of a later Falk Institute project, Ben Bassat (2002b), there is only one discussion of the conflict, as a part of the chapter on fiscal policy (Strawczynski and Zeira 2002).[1] In a survey of six books on the Israeli economy, M. Klein (2005) gently comments toward the end of the survey on the lack of reference to the conflict in the books.

These omissions are puzzling. Is it possible that the conflict is important to Israel in general, but not to its economy? This book shows that this is not the case: The conflict has significant effects on many aspects of the economy. Part II of this book describes and analyzes the main effects of the conflict on the economy. However, the discussion of the conflict is not limited to this part alone. Already chapter 4 shows that the level of output in Israel could be 26 percent higher if investors in Israel did not face the high risk of conflict. The conflict plays an important role in other parts of the book as well. Chapter 7 on business cycles shows how outbreaks of the conflict with the Palestinians tend to cause recessions. Chapter 8 on the balance of payments lists the conflict as one of the variables that has increased the trade deficit in the past. Chapter 9, which examines the episode of high inflation, also connects it to the high costs of the conflict during the 1970s.

Why does the conflict receive so little attention from economists? I am not an expert on the sociology of science, so I refrain from offering a full explanation. It could be partly due to lack of data because of secrecy. It could be partly because some of the main costs of the conflict are opportunity costs and are thus less tangible. It could also be a result of the political sensitivity of the conflict in Israel. However, this book devotes more space to the economic analysis of the conflict than other books, simply because the conflict's economic effects happen to be highly significant. Another reason is that the conflict is the most crucial issue that Israel is facing. It is therefore important to understand all its aspects, including the economic ones.

The analysis of the conflict in part II differentiates between the two historical phases, the

"narrow conflict" and the "wide conflict," as explained in chapter 1 of this book. This distinction is important not only historically but economically as well. Until 1948, the narrow conflict between the Jews and Palestinian Arabs was a conflict of militias, limited to light weapons and explosives, and thus incurring low military costs. During the phase of the wide conflict that began in 1948, Israel faced conventional armies and experienced conventional warfare. That led to high military costs, especially in the years 1967–1980, when the conflict intensified. After Israel occupied large territories from Egypt, Syria, and Jordan in 1967, it did not retreat from them immediately, as it did in 1956. This created tension between Israel and these countries and led to more wars, mainly the War of Attrition in 1968–1970 and the Yom Kippur War in 1973. This intensification of the conflict led to a severe fiscal crisis, as chapter 5 shows.

In 1978, Israel and Egypt signed the Camp David Accords, which led to a peace treaty between the two countries in 1979. The implementation of the agreement, which consisted of a full return of the Sinai Peninsula to Egypt, was gradual and ended in 1982.[2] The first test of the agreement came immediately in 1982, when Israel invaded Lebanon, and Egypt kept the agreement. The peace with Egypt changed the Israeli-Arab conflict profoundly, as both sides realized that the "wide conflict" phase had ended. They understood that it would be impossible to form a fighting military Arab coalition against Israel, without Egypt, the most populous Arab country with the strongest army. This understanding enabled Israel to reduce its military costs significantly during the 1980s and early 1990s and thus to end its fiscal crisis.

The end of the phase of wide conflict led the Palestinians to intensify their opposition to the Israeli occupation. In December 1987, the First Intifada broke out, and since then, the conflict has remained mainly between Israelis and Palestinians. It therefore has returned to its initial narrow phase, an ethnic conflict between two national groups. The military costs to Israel in this phase of the conflict are much lower. However, the renewed narrow conflict created new economic costs to Israel. The main one has been greater vulnerability of Israel to business cycles. Eruptions of the Israeli-Palestinian conflict tend to cause recessions, which is opposite to the effect of the past conventional wars. Chapter 7 in part III of the book surveys business cycles in Israel and demonstrates this effect.

Finally, some important economic effects appear both in periods of wide conflict and in those of narrow conflict. These economic effects do not show up only in outbreaks of the conflict, but also during routine periods as well. Chapter 4 already presents one such effect, of higher risk, which reduces capital and output. Chapter 6 presents more such effects, of which the main one is the cost of conscription. Most young Israelis undergo a long military service. This service has a significant opportunity cost. Conscription causes young Israelis to enter the labor market after a significant delay, due both to the long service and the traditional big trip abroad after the military service. Hence, Israelis begin to accumulate human capital, through studies, experience, and finding the right job, later than young people in other countries. Since they still retire around the age of 65, they have lower human capital during most of their career, their lifetime earnings are lower, and aggregate GDP is lower as well. Chapter 6 estimates this loss to amount to more than 5 percent of GDP.

The costs of conscription are only part of the overall routine costs of the conflict, which add to the direct military costs. These are use of land, loss of life, costs of civil defense, security guards, and more. Chapter 6 estimates these and other costs that do not appear in the standard statistics as well, like support to settlements and costs of the Boycott, Divestment and Sanctions (BDS) activities. In addition, it tries to estimate some potential economic benefits to the conflict.

The chapter shows that even today, when the conflict is narrow and direct military costs are low, the overall cost of the conflict is very high and might surpass 30 percent of GDP. Most of these are opportunity costs and therefore the public cannot observe them directly and is largely unaware of them.

1. A recent book, Rivlin (2011), devotes much more of the analysis to conflict related issues.
2. There remained a dispute about the resort Taba, which was resolved only in 1985.

5

The Conflict and the Fiscal Roller Coaster

Direct Military Expenditures over the Years

The wide conflict led to conventional costly wars and increased military expenditures. Figure 5.1 presents direct military costs over the years, which include spending by the Ministry of Defense and the secret services. It presents such expenditures as a percentage of GDP.

Figure 5.1 shows truly unique dynamics. Until 1967, Israel's defense expenditures were less than 10 percent of GDP on average. After 1967, they doubled to more than 20 percent of GDP. They remained at such levels until the early 1980s, and in 1973–1976, after the Yom Kippur War, they even reached 30 percent of GDP. Prior to 1967, defense expenditure increased only once during the Sinai (Suez) campaign of 1956, to 13.5 percent of GDP. However, defense costs immediately returned to a lower level, since Israel withdrew from Sinai after a few months. In contrast, after 1967, Israel did not withdraw from the territories it conquered, which created tension with Egypt, Syria, and Jordan. Fighting renewed often, first in the War of Attrition and then in the Yom Kippur War. Hence, 1967 was not an isolated outbreak, but increased the intensity of the conflict, as reflected in the high military expenditures after 1967.

The high defense costs after 1967 put a huge burden on Israeli citizens. For historical comparison, military spending in the United States during World War II was higher, reaching a peak of 41 percent of GDP in 1945. However, Israel's defense spending was high for a much longer period, of almost 20 years, while US involvement in World War II lasted only 4 years.

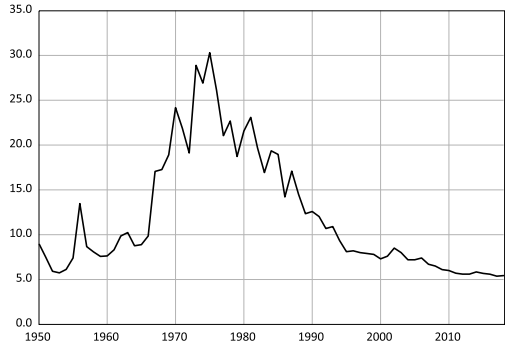

FIGURE 5.1. Israel's direct defense expenditure, 1950–2018 (percent of GDP).
Data are from Central Bureau of Statistics (2015, table 4) until 2013 and from that year on from Bank of Israel (2019c, table 6.A.8).

Military spending increased after 1967 not only due to the cost of fighting but also due to spending on the new territories, such as for building roads and other military infrastructure

projects. However, the major rise in military spending was on weapons and ammunition, due to the great effort to increase the army and improve its equipment. This effort was a result of the rise in military threats after 1967 but also of the trauma caused by the French arms embargo on Israel in 1967, issued by French President de Gaulle. Before 1967, France had been the main supplier of arms to Israel, including jets, tanks, guns, and even nuclear equipment.

The drastic change in French policy led Israel to a concerted effort to develop its military industries and to make the country more self-sufficient militarily. During this period, defense industries developed many new Israeli weapons, such as the Merkava tank, the Cylinders Floating Bridge for crossing water obstacles (mainly the Suez Canal), various missiles, tactical unmanned aerial vehicles, the Galil rifle, and many other new weapons and ammunition. Israel also developed new fighter jets, the Nesher and Kfir, based on stolen plans of the French fighter jet Mirage. It even began to develop a completely new fighter jet, Lavi, but canceled it in 1987 after significant pressure from the United States.

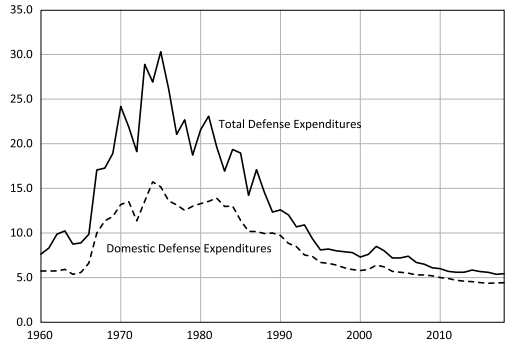

FIGURE 5.2. Total and domestic defense expenditures in Israel, 1960–2018.
Data for total defense costs are the same as for figure 5.1. Data for domestic defense costs are from Central Bureau of Statistics (2015, table 4) until 2013 and from that year on from Bank of Israel (2019c, table 6.A.2(2)).

However, in parallel to Israeli efforts to develop its own weapon systems, the United States became a major arms supplier to Israel following the 1967 war. It supplied fighter jets, tanks, guns, armored personnel carriers, communication equipment, and more. These were relatively modern systems, used in the Vietnam War, like Patton Tanks, unlike previous American equipment sold to Israel, which was World War II vintage, like Sherman tanks. Military imports from the United States increased Israeli defense costs significantly, as these were expensive weapon systems. Figure 5.2 presents total defense costs from figure 5.1 together with domestic defense costs (described by the dashed curve). The vertical difference between the two curves is the cost of defense imports.

Figure 5.2 shows that domestic expenditures rose from 6 percent of GDP before 1967 to an average of 13 percent of GDP during the escalation of the conflict in 1967–1984. Expenditures on military imports increased by much more. These had been less than 4 percent of GDP before 1967, and they more than doubled to around 10 percent of GDP after 1967. In the years 1973–1976 of the military buildup after the Yom Kippur War, military imports were very high and reached 15 percent of GDP. The rest of this chapter shows that the rise in intensity of the conflict after 1967 led the country into a severe fiscal crisis.

The Fiscal Roller Coaster

This section examines the dynamics of fiscal policy in Israel over the years. It first presents the main fiscal variables—expenditures, income, and the deficit, which is the difference between expenditures and income—using three rules. First, it does not describe the budget, which is an annual plan of action, but de facto activities, measured after the end of the year. Second, it refers to the entire public sector and not only to the central government. Hence, it includes local government, the National Insurance Institute (similar to Social Security in the United States), the public nonprofit institutions (hospitals, health funds, universities, etc.), and the Jewish Agency. Third, it measures all fiscal variables as percentages of GDP.

The choice of actual spending and income over budget data is obvious, although the differences are not large. The choice of public sector reflects the fact that there are many flows between the central government and the rest of the public sector. On one hand, the government finances a large part of the activity of these bodies. On the other hand, other parts of the public sector also paid the cost of the conflict, like the National Insurance Institute, which paid income compensation for reserve service.[1] This is also a common practice in international publications. Note that our fiscal data begin at 1960, following the annual reports of the Bank of Israel. Earlier fiscal data from other sources are not compatible with the data from the Bank.

Presentation of fiscal variables as percentages of GDP is very common, especially in comparisons over time and across countries, but it requires some further explanation. An important goal of such data is to measure quality of public services. Most services, like health, education, welfare, housing, and police, should be proportional to the size of population if their quality remains unchanged. They should also be proportional to average income, since if wages paid to their workers decline relative to average income, such services might attract lower-quality workers. Hence, to keep quality of a service constant, its cost should rise proportionally to population and income. Since the product of population times income is GDP (approximately), then the right measure of quality of a service is in percentage of GDP. It holds for public income and public debt as well, as their share in GDP gives the best indication of their burden.

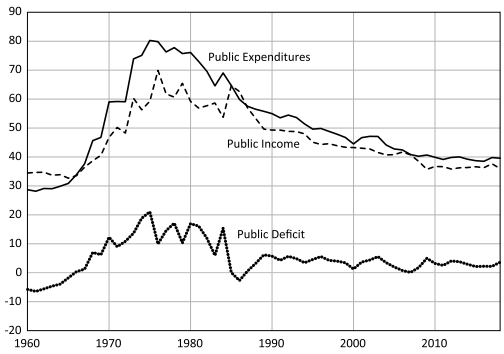

FIGURE 5.3. Expenditure, income, and deficit of the public sector, 1960–2018 (percent of GDP).
Source of data is Bank of Israel (2018, tables 6.A.1 and 6.A.2). Beginning in 2018, the Bank of Israel included indexation costs on the indexed public debt in the expenditures for the period following 1995. To ensure consistency of the data, I use the 2017 report instead of the 2018 report until 2017. Data for 2018 are from Bank of Israel (2019c, tables 6.A.1 and 6.A.2), where I deduce an estimate of indexation costs of 0.24 percent of GDP, from the expenditures, to make the data compatible.

Figure 5.3 outlines fiscal policy in Israel in the years 1960–2018. It presents public expenditures (solid curve); public income (dashed curve); and the deficit (dotted curve), which is the difference between the other two curves. Note that the income of the public sector includes

not only tax revenues but also fines; profits of government companies; and inter-governmental transfers, such as the West German reparations from 1953–1966 or US aid after 1970. In addition, public income includes donations from Diaspora Jews, mainly to national institutions like the Jewish National Fund, or to nonprofit institutions (like universities and hospitals).

Figure 5.3 describes a fascinating fiscal history. While during most of the 1960s, public expenditures were relatively low (less than 30 percent of GDP), they jumped in 1967, climbed within a few years to more than 70 percent of GDP, and remained high until the early 1980s. Since then, expenditures have gradually declined and are now less than 40 percent of GDP. The income of the public sector also increased after 1967, but by less. As a result, the deficit increased to an average of 15 percent of GDP between 1973 and 1984. This led to increases in public debt, which reached 150 percent of GDP by 1985. As a result, Israel experienced a severe fiscal crisis, which also caused high inflation, as I show in chapter 9.

The dramatic rise and fall of public expenditure in Israel is exceptional in any international comparison, and I call it a fiscal "roller coaster." In Israeli public discourse, many have claimed that the crisis was a result of gross irresponsibility by the government, as described later in the chapter. This chapter presents evidence supporting a different view, that the fiscal crisis was mainly a result of the intensification of the conflict.

The Fiscal Crisis and the Rise of Defense Costs

To analyze the rise of public expenditures after 1967, I examine how the main components of expenditures behaved over time. Figure 5.4 plots public spending on three goods and services: defense (solid curve), civilian consumption (dashed curve), and public investment (dotted curve). As shown in figure 5.1, defense spending increased significantly after 1967, from 7.3 percent of GDP on average in 1960–1966 to 26.9 percent on average in the 1970s.[2] Hence, defense expenditures increased by 20 percent of GDP due to the escalation of the conflict.

Defense expenditures therefore explain a big part of the rise in total public expenditures, but not all of it, as this total increased by 45 percent of GDP: from 30 percent of GDP before 1967 to around 75 percent of GDP in the 1970s. Hence, there is still a need to explain the rest of the rise in public spending, which is 25 percent of GDP. According to figure 5.4, civilian consumption remained stable throughout the 1960s and 1970s and rose moderately (by 2 percent of GDP only). Public investment increased slightly until 1972, but then it declined to a lower level than in 1960. The missing part of public expenditures therefore lies elsewhere.

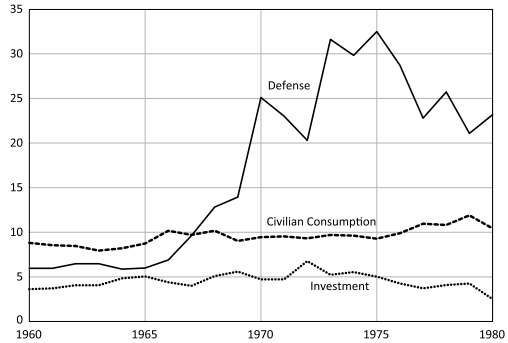

FIGURE 5.4. Defense expenditure, civilian consumption, and investment, 1960–1980 (percent of GDP). Data are from Bank of Israel (2019c, table 6.A.2).

Public civilian consumption includes education, health services, law and order, public transportation, public housing, and general administration. Most of these services did not experience large changes during these years. The only noticeable change was the extension of free education from the tenth to the twelfth grade in 1977. However, this did not have a large effect on education costs. In the 4 years from 1977 to 1981, real education costs increased at an annual average rate of 1.4 percent, which was lower than the rate of growth of real GDP.[3] Public investment declined during these years, mainly due to the completion of several large projects, including the National Water Carrier from the Sea of Galilee to the South, Dead Sea Industries in Sodom, and Ashdod Port, among others.

The Rise of Other Expenditures

If public consumption and public investment cannot account for the additional 25 percent of GDP rise in public expenditures, what else can explain it? Figure 5.5 presents public expenditures that are not direct demand for goods and services, but rather transfers of income to the public. There are three main such expenditures. The first is interest payments (described by the solid curve in the figure), the second is support to the business sector (dashed curve), and the third is transfer payments to citizens (dotted curve).

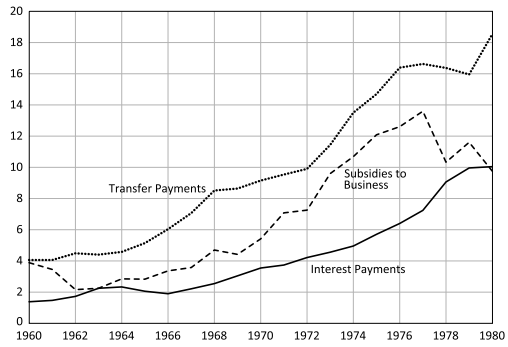

FIGURE 5.5. Interest payments, subsidies to business, and transfer payments, 1960–1980 (percent of GDP). Data are from Bank of Israel (2019c, table 6.A.2).

All three expenditures in figure 5.5 increased significantly between 1966 and 1980. Interest payments rose by 8 percent of GDP, subsidies to business rose by 10 percent of GDP until 1977 and then declined by 3 percent of GDP temporarily.[4] Transfers increased by more than 10 percent of GDP till the end of the 1970s. Together these three expenditures increased by 25 percent of GDP, which, together with the rise of defense costs, account for the full increase of public expenditures. We next turn to analyze what caused their significant rise after 1967.

First, consider interest payments. The increase in defense expenditure after 1967 raised total public expenditures. Public income increased as well, as figure 5.3 shows, due to higher taxes and the arrival of US aid. However, revenues rose by less than expenditures, resulting in a deficit that increased immediately after 1967, as shown in figure 5.3, and reached a high level of 15 percent of GDP from 1973 on. The government financed its deficit both by issuing debt (two-thirds of the deficit) and by printing money (one-third of the deficit).[5] Since the government borrowed annually about 10 percent of GDP, its public debt increased significantly, which increased interest payments continuously, from 2 percent of GDP in 1965–1966 to 10 percent of

GDP in 1980, and even more in later years, until 1985.

In general, the government subsidized businesses through three main channels. The first was support in building new projects, to encourage investment in industry in the periphery of Israel. Such subsidies follow the 1959 Capital Investments Encouragement Law, which offers a combination of a public finance of part of the initial investment and corporate tax reductions. One of the original intentions of the law was to attract foreign investors to Israel. The second channel was subsidized credit to firms. Such subsidies developed because the government was the main source of foreign finance, due to West German reparations and later, US aid. This channel increased significantly from 0.6 percent of GDP in 1966 to 7 percent of GDP in 1980. The third channel was support to exports. It increased significantly in the 1950s (as an aid to "infant industries"), declined sharply in the early 1960s, and then rose again after 1967.[6] The support to exports increased from 0.3 percent of GDP in 1965 to 5.2 percent of GDP in 1977.[7]

Hence, from 1965 until 1977, subsidies to credit and to exports increased by more than 10 percent of GDP, which was all the increase in subsidies to business. Thus the subsidies of the Capital Investments Encouragement Law did not rise by much. The sudden rise of the credit and export subsidies after 1967 is explained by the reserve service in the Israeli military. Israeli men remain in reserve units after their years of conscription until the late age of 40–50 years.[8] The army calls them to active duty in times of war, when the reserve units participate in fighting, but also between wars, for training and for routine missions. After 1967, the army called reservists to service much more often, due to the intensification of the conflict. Most reservists served more than 2 months annually during these years of high conflict. They had to leave their jobs for extended periods, which had a strong disruptive effect on economic activity.[9] Businesses turned to the government for help and received it, either in credit or in direct subsidies. As exporters were the most hurt by the extensive reserve service, being global competitors, they received more support.

Transfer payments increased by 10–12 percent after 1967. Transfer payments consist of three main components. The first is welfare payments made by the National Insurance Institute, such as payments to the elderly, support for disabilities, child allowances, and unemployment benefits. The second transfer is pension payments to retirees from the public sector. The third transfer was price subsidies, mainly for basic foods like bread, milk, and frozen chicken, to support poor families. According to the National Insurance Institute, welfare payments increased from 2.1 percent of GDP in 1965 to 7 percent of GDP in 1980.[10]

There are three main explanations for the rise in welfare payments. One is the aging of the population, which was originally very young, and began to mature during the 1960s and 1970s. This increased old-age payments from less than 1 percent of GDP in 1965 to 2.5 percent of GDP in 1978.[11] The second development was the tax reform following the Ben-Shachar Committee report in the mid-1970s, which introduced Child Allowance Benefits instead of Tax Benefits for children, as was the case previously. This reform increased transfer payments by 2 percent of GDP, but it also increased tax revenues and therefore had no effect on the deficit. The third explanation is the increased reserve service due to the intensification of the Israeli-Arab conflict. The National Insurance Institute compensated reservists for their service. These payments increased from close to zero in 1965, to 0.8 percent of GDP in 1970, to 2.3 percent in 1973, and then returned to 0.8 percent in the late 1970s. After 1995, these payments became part of the defense budget, to incentivize the army to call fewer reservists to service. Hence, we can split the rise in welfare payments of 5 percent of GDP to 2 percent due to aging of the population, 2

percent due to the tax reform, and more than 1 percent due to increased reserve service. In addition to these changes, the Israeli welfare system introduced new subsidies, like unemployment benefits and disabled benefits in 1975 and income support benefits in 1982, but during the 1970s, their effect on expenditures was negligible.

We next turn to the two additional transfers, price subsidies and pension payments to retirees from the public sector. Inflation in Israel began to rise in the early 1970s, but in 1973, it stabilized at a level of 45 percent annually. In 1979, it rose to a higher level of 120 percent annually, and in 1983 it jumped to a level of 400 percent annually. As shown in chapter 9, the cause of inflation was the large public deficit, of which the government financed a third by printing money. The high inflation eroded real incomes of many individuals, especially the poor and the elderly. That put pressure on the government to increase price subsidies, which indeed rose from less than 2 percent of GDP in the late 1960s to 3.5 percent of GDP in 1973, when inflation increased, and reached more than 6 percent of GDP in 1981.[12] Subtracting price subsidies and welfare payments from total transfers shows that the pensions to retirees of the public sector increased from around 2 percent of GDP before 1967 to only 4–5 percent of GDP in 1980, so this item did not contribute much to the increase in public expenditures after 1967.

It's the Conflict …

The previous two sections show that the ultimate cause for the rise in public expenditures was the escalation of the Israeli-Arab conflict after 1967. The escalation increased defense expenditure by 20 percent of GDP and by even more in the mid-1970s. However, the intensification of the conflict had indirect effects as well. One such effect was increased support to business by close to 10 percent of GDP, due to increased reserve service and the losses it inflicted on businesses. Another indirect effect was the rise in interest payments by 8 percent of GDP, as higher defense costs created a deficit, which increased public debt and interest payments. The rise of price subsidies by 4 percent of GDP due to the high inflation was also a result of the high deficit and thus of the conflict. All these costs added up to 42 percent of GDP, which accounts for almost all the rise in expenditures after 1967.

Such direct and indirect effects connect with the well-known distinction in economics between exogenous and endogenous changes. An exogenous change comes from outside the economic system, while endogenous changes are results of the adjustment of the economic system to the exogenous change. The major exogenous change in Israel at the time was the intensification of the conflict. It significantly increased military expenditures and reserve service, which hurt businesses significantly. The endogenous economic responses to this exogenous change were higher debt and higher interest payments, inflation and higher price subsidies, and greater subsidization of businesses.

This analysis raises serious doubts about much of the Israeli public discourse over these years, which tends to describe the fiscal crisis of the 1970s and 1980s as a case of fiscal irresponsibility, made possible by excessive public involvement in the economy. For example, Assaf Razin and Efraim Sadka write: "At the same time, the government's inability to keep spending in check and to maintain a consistent, balanced, and restrained economic policy, led to a spiraling inflation.… This inability to deal systematically with the country's basic economic and social problems stemmed from, inter alia, the desire to rapidly increase the standard of living in the short term."[13]

A close look at the data in this chapter reveals a very different story. A severe exogenous shock—the steep rise in the intensity of the conflict—hit the Israeli economy and increased both defense costs and reserve service. This led to additional costs (like support to business, interest payments, and food subsidies). Of course, this does not mean that the government did not make mistakes during the long period of the crisis. Far from it. Chapter 9 on the high inflation experienced during this time presents two grave policy mistakes that led to two large jumps in inflation. However, such mistakes do not diminish the main role of the exogenous shock.[14]

This raises an interesting counterfactual question: Could the government have avoided the crisis by reacting differently to the initial shock? I think that it would have been very difficult and probably impossible, as far as we can judge in hindsight, mainly due to the timing of events. Defense costs rose fast after 1967, as figure 5.1 shows. Public income increased as well, as tax revenues rose from 25 percent of GDP in 1967 to 40 percent of GDP in 1970, but they increased more slowly than defense costs. As a result, the deficit rose to 7 percent of GDP in 1968, 6.2 percent in 1969, and to 12 percent in 1970. Hence, debt began to accumulate, and interest payments increased. Note that US aid began only after 1970 and became massive only after 1973, when Israeli expenditures were already too high. Even when taxes increased to almost 50 percent of GDP, which was probably the highest possible tax burden, public income (including US aid) was much lower than expenditures, and the deficit remained too high.

Could the government have avoided the crisis earlier by reducing other expenditures? Civilian public spending prior to 1967 was around 20 percent of GDP. To reduce the deficit significantly before it became too large (namely, before 1973), the government would have had to reduce spending by at least 5 percent of GDP. Reducing civilian expenditures by a quarter is a huge cut, which is hard to implement even in times of emergency. Note also that in 1967–1973, Israel absorbed a wave of immigration from the West and from the Soviet Union. The government hesitated to take harsh measures that could harm the standard of living, to avoid deterring potential immigrants.

The next section shows that the fiscal crisis ended in 1985, mostly thanks to a new exogenous shock to the economy. This shock was completely opposite to the shock of 1967. It was the peace agreement with Egypt, signed and implemented between 1978 and 1982, which enabled Israel to stabilize its fiscal policy in 1985. In other words, only correcting the initial cause for the fiscal crisis made it possible to end it.

Peace with Egypt and the End of the Fiscal Crisis

In July 1985, the Israeli government decided on a stabilization program to end high inflation and to stabilize fiscal policy. Chapter 9 on high inflation in Israel describes and analyzes in detail the stabilization program. This section focuses on one aspect only: the contribution of the Peace with Egypt to the program's success. An important component of the stabilization was a special transfer from the United States, in addition to its regular aid to Israel, of $3 billion, transferred in 1985 and 1986.[15] This special gift enabled Israel to close its deficits in these 2 years. The deficit in 1985 was close to zero, and Israel had a public surplus of 2 percent of GDP in 1986. However, this transfer was limited in time, and the deficit could have risen again after 1986, unless something else happened.

From the early 1980s, defense expenditures began to decline sharply relative to GDP. In 1980, defense costs were still high (23.2 percent of GDP), but by 1987, they had already declined

to 14.5 percent of GDP. By the end of the decade, these costs reached a level of 12.1 percent of GDP, and by 1994, they were already below 10 percent. This sharp decline in defense costs helped the government keep its deficit low and therefore reduce public debt and interest payments as well. The lower intensity of the conflict also led to less reserve service, which enabled the government to reduce support to the business sector. Furthermore, the decline of inflation after 1985 enabled the government to reduce price subsidies significantly.

TABLE 5.1. Expenditures on defense, interest, and business support, selected years (percent of GDP)

Expenditure	1981	1985	1990	1995	2000	2010	2018
Defense expenditures	19.8	18.5	12.4	7.8	7.0	5.8	4.9
Interest payments	11.0	12.6	8.7	6.1	5.1	3.2	2.0
Support to business sector	11.6	6.2	2.7	1.0	0.6	0.5	0.9

Source: Data until 2010 are from Bank of Israel (2018, table 6.A.2). Data for 2018 are from Bank of Israel (2019c, table 6.A.2), with a correction to interest payments, as their calculation changed in this year.

Table 5.1 demonstrates that the expenditures affected by the conflict indeed declined significantly after 1980. Defense spending and support to businesses began to decline by 1980. The indirect spending on interest payments and price subsidies began to decline after 1985, when the deficit fell and high inflation ended. Price subsidies went down from 4.5 percent of GDP in 1984 to 1.5 percent of GDP in 1986, within 2 years of implementation of the stabilization program.[16]

Therefore, table 5.1 shows that the main components of expenditures, which increased after 1967, were those that declined beginning in the early 1980s and especially after 1985. That is, since the peace agreement with Egypt removed this country from the conflict, which de facto ended the phase of the wide Israeli-Arab conflict. Next, I show how an article by Strawczynski and Zeira (2002) lends further support to the connection between the decline in military costs and the peace with Egypt.

The article examines how Israeli public expenditures declined after 1985. It includes a statistical test of the long-term relationship between defense expenditures in Israel and military costs of the confrontation countries, Egypt, Syria, and Jordan, during the years 1966–1997. This indicator is important, because it measures how strong the military threat to Israel is. Economists call a statistical test of the relationship between variables a “regression,” and it is a major economic research tool. In the article, it estimates by how much defense spending in Israel rises when defense expenditures in the conflict countries rise by 1 percent. Note that regression tests do not imply causality between the two variables, but only the statistical correlation between them. In other words, a positive coefficient on military expenditures of the conflict countries does not imply which side is the aggressor and which side reacts in defense. It only means that over the years, there was correlation between military spending on the two sides.

A successful regression test of the relationship between the dependent variable (defense costs of Israel) and the independent variable (the sum of military costs of the rival countries) should include other relevant variables to control for their possible effects. This inclusion is required to identify the right correlation with the main explanatory variable, namely, the defense expenditures of the conflict countries. Hence, the article added three more variables to the regression. The first is the price of military spending relative to the general price index, since the price should affect spending. The second variable is a time trend, to capture the effect of

technical change in military equipment, which increases defense expenditures relative to other costs over time. The third variable is US military spending, to capture the effect of extensive US military aid to Israel after 1967.[17] In addition, Strawczynski and Zeira (2002) do not use standard regression tests, as military costs and prices rise over time and are not "stationary." Hence, they apply "cointegration" regressions, which examine how the variables move together over time.

The findings of the tests of Strawczynski and Zeira (2002) are very interesting. The first result is that throughout the period, there was no consistent relationship between military costs of Israel and the other variables. Then they identify a break in the relationship between the variables some time during the 1980s. There was a significant relationship between the variables until 1985 and another relationship, also significant but different, after 1985. Before 1985 a strong positive correlation existed between the military costs of Israel and of its rivals, where an increase in military spending by the rivals of 1 percent led to 0.82 percent increase in Israel's military spending. After 1985, the correlation between military expenditures of Israel and those of its rivals almost disappeared, as the coefficient of rivals' military costs was −0.37 and was insignificant statistically.

The effect of price on defense spending also underwent a dramatic change in the 1980s. Prior to 1985, a 1 percent rise in the price of defense increased domestic defense spending by 1 percent, which means that the quantity purchased did not change. After 1985, a rise of 1 percent in price resulted in a negligible change in military costs. In other words, after 1985, the army purchased fewer products when prices went up. This result means that after 1985, the army responded much more to prices and became more frugal.

The strong positive correlation between the military spending of Israel and of its rivals, Egypt, Syria, and Jordan, until 1985 is not surprising, as it reflects the fact that the wide Israeli-Arab conflict posed a significant threat to Israel until the early 1980s. What is surprising is that after 1985 this correlation disappeared. This result reinforces my claim that the peace with Egypt ended the broader Israeli-Arab conflict de facto. Hence, after 1985, military spending by the rival countries has not threatened Israel as it did before. The result that defense spending became more sensitive to price also supports this claim. A country under severe military threat pays less attention to price when it decides on purchasing arms or recruiting more soldiers. Only when the threat is lower does it become more sensitive to prices.

When defense spending began to decline after the peace agreement with Egypt, Israel experienced another war, the Lebanon War, which began in 1982.[18] Interestingly, this war did not change the trend of decline in Israeli defense expenditures. On the eve of the war, in 1981, domestic defense expenditures were 13.5 percent of GDP.[19] In 1982, these expenditures rose to 13.9 percent of GDP, which was a negligible increase. In 1983, domestic defense costs declined to 13 percent of GDP. Hence, the war years did not significantly increase Israel's military expenditures. This is not surprising, since it was mostly a war against Palestinian militias in Lebanon, and the few battles against the Syrian Army were limited in scale and duration. These observations further support the main claim of this chapter, that high defense costs were due to conventional wars between armies.

Summary: The Wide Conflict and Its Fiscal Cost

The historical introduction in chapter 1 and this chapter make a sharp distinction between the narrow and the wide phases of the Israeli-Arab conflict. This distinction is important, since the

economic effect of the conflict is different for each phase. This chapter examines the effect of the wide conflict by focusing on a specific episode of the intensification of the conflict in 1967–1980. This period serves as a "laboratory experiment." Not all wars lead to such an intensification of conflict. As shown in figure 5.1, the Sinai War (or the Suez Campaign) in 1956 was very costly to Israel and increased defense expenditures to 13.5 percent of GDP. However, Israel did not stay in the Sinai Peninsula and the Gaza Strip conquered in that campaign, since the United States and the Soviet Union joined in pressuring it to retreat from these territories. Israel withdrew within 5 months. As a result, the conflict did not intensify, and by 1957, defense spending was low again at 8.7 percent of GDP.

Things were very different in 1967. Israel did not withdraw from the territories it conquered, probably because this time the United States was more supportive of Israel's actions. As Egypt and Syria applied military pressure on Israel to withdraw from their territories, the conflict intensified. The period 1967–1980 shows that once the wide conflict intensifies, its economic costs become very high, not to mention the human losses. The chapter shows that the intensification of the wide conflict in these years led to a huge increase of public expenditures, from 30 percent of GDP to more than 75 percent of GDP, with a deficit of 15 percent of GDP, leading to a spiraling debt and to high inflation. In short, it caused a terrible fiscal crisis. Only peace with Egypt, which required full withdrawal from the Sinai Peninsula, ended the intense conflict, reduced both direct and indirect costs of the conflict, and ended the fiscal crisis.

This period of intense conflict and fiscal crisis also affected the incomes and standards of living of Israelis. The high taxes during this period, both income and excise taxes, and the inflation tax as well, significantly reduced disposable income. At the beginning of this period (in 1967–1973), Israel was still growing fast, which compensated for some of the rise in taxation. However, after 1973, output growth slowed down significantly, and the burden of taxation became much more evident. Only after 1980, when defense-related costs began to decline, was the government able to reduce taxes gradually. Israelis began to feel a rise in their disposable incomes, especially relative to other countries. Although Israel ended its catching-up phase by 1973 (as shown in chapter 2), its catching up in standards of living came much later, in the years after the peace with Egypt, as the costs of the conflict declined.

However, Israel still holds large territories that it conquered in 1967, mainly the Palestinian territories of the West Bank and the Gaza Strip.[20] This leads to a continuing conflict, but it is not a costly conventional conflict, since unlike Egypt, Syria, and Jordan, the Palestinians do not have a conventional army. The conflict with them is a narrow conflict, which uses militia warfare. However, even such a conflict is costly. Israel is not losing jets, tanks, and other expensive weaponry, as it did in its wars with the Arab countries, but it has other costs, as described in the next two chapters.

1. For transfers between the central government and other parts of the public sector, see chapter 12.

2. The data in the two figures are not exactly equal. The data in figure 5.1 are from the Central Bureau of Statistics, while those in figure 5.4 are from the Bank of Israel (to make them comparable to other expenditures). The two data sets differ mainly in calculation of pensions for military retirees. This is not a large difference, and chapter 6 discusses it in more detail.

3. See Central Bureau of Statistics (2018a), table 3.

4. This decline was due to the failed liberalization of 1977, discussed in chapter 9.

5. See chapter 9 for this calculation.

6. See chapter 11 for a discussion of export subsidies over the years.

7. See Bank of Israel (2019c), table 6.A.11.

8. Reserve service of Israeli women is short and ends when they get married or even earlier.

9. The data on reserve service in that period are classified. Recently, Beer (2019) wrote that on his deathbed, Moshe Dayan, the minister of Defense in 1968–1974, said that the amount of reserve service at the time was huge and had a large economic effect. Many people served 170 days each year during the War of Attrition, month in and month out. Dayan said, “The economy was in shambles.”

10. See National Insurance Institute (1980), table A/2.

11. See National Insurance Institute (1980), table A/3.

12. The data on price subsidies for domestic and imported goods are from the following Bank of Israel Reports: (1968), table 7.14; (1969), table 7.11; (1970), table 7.11; (1973), table 7.8; (1977), table 10.5; (1979), table 11.14; (1982), table 5.10; and (1984), tables 5.9 and 5.10.

13. See Razin and Sadka (1993), p. 19.

14. The intensification of the conflict was exogenous to the economy but was probably endogenous politically. It was due not only to Arab hostility but also to Israeli rejection of various peace proposals at the time.

15. The support for stabilization came with a small string attached. US Secretary of State George Schultz nominated two distinguished American economists, Stanley Fischer and Herbert Simon, to oversee the stabilization.

16. Note that since 1981 the Bank of Israel includes price subsidies under ‘support to business’ and not in transfers, due to a change in Statistics for National Accounts (SNA).

17. The article does not use US aid itself as a control variable, since it reflects the state of the conflict, as it increased in 1973. Instead, the article uses global US military expenditures, which are exogenous.

18. It was a full-fledged war from June 4 to September 29, 1982. Then it continued at a lower intensity, through gradual withdrawals from Lebanon, until the final withdrawal from the south of Lebanon in 2000.

19. The focus on domestic costs is because military imports have rather independent dynamics, as purchases of large weapon systems, like fighter jets and submarines, are highly concentrated.

20. Israel also controls the Golan Heights, which it conquered from Syria.

6

Additional Costs of the Conflict

The Conflict between Outbreaks

Chapter 5 shows that the fiscal costs of the conflict were high when the wide conflict intensified. Nowadays the conflict is narrow, and its direct costs are relatively low, around 6 percent of GDP. However, this chapter shows that even the narrow conflict is costly and remains so even between outbreaks, due to significant additional costs.[1] It discusses three types of costs. Some are budgetary, but not included in the defense costs. The second type of additional costs are what Israeli citizens pay directly instead of the government, such as for sheltered rooms in new apartments. The third type of additional costs are "opportunity costs," which are the potential economic gains that would result if there were no conflict. A prominent opportunity cost is due to conscription.

Every Israeli has to serve in the military, beginning at the age of 18. Men serve 3 years (recently reduced to 32 months) and women 2 years. In reality, not everyone serves. Israeli Arabs, Ultra-Orthodox Jews, and young men who have service problems (either mental or social), are exempt.[2] Only 70 percent of Jewish men serve in the army. Arab women are exempt from service. Jewish religious women can choose whether to serve or not. Only 50 percent of Jewish women serve in the army. General service in the army carries with it two opportunity costs. One comes about because military pay is less than what the conscripts could earn in the labor market. The second and much higher opportunity cost is due to the late entry of conscripts to the civilian "work path," which creates a delay in the accumulation of human capital and thus a loss of income and output.

This chapter is actually an update of Berglas (1986), who was the first to list and estimate the additional costs of the conflict that do not appear in the formal accounting of defense costs. He found that in the 1980s, these additional costs were as high as 50 percent of domestic defense spending, which was around 7 percent of GDP at that time. The calculations of Berglas need serious updating, due both to institutional changes over time and to improved economic research tools developed since his results were published. On one hand, some of Berglas' additional costs, such as pensions and reserve service, became part of the defense budget during the 1990s. On the other hand, his calculation of the cost of conscripts did not include the loss of human capital, since the tools to calculate aggregate human capital and its effects are new, dating from the late 1990s.[3]

Tal Wolfson (2010) updated Berglas (1986) in a senior thesis done at the Hebrew University. Later, Bamya, Wolfson and Zeira (2015) conducted a new update of the additional costs in a study by the Aix Group. The update used 2011 data, and this chapter borrows from this research,

although some of the calculations here have been redone. The Committee for Shortening Conscription (2006), headed by Avi Ben-Bassat, also calculated the cost of conscription, but without the delay in accumulation of human capital.

Conscription and Loss of Human Capital

This section measures the loss of output due to the delay in accumulation of human capital that is caused by conscription. It uses data from the survey of income in Central Bureau of Statistics (2011a), so the people studied had done their military service prior to 2011, when men served 3 years and women 2 years. Although recently men serve 4 months less, this reduction should not change the calculation significantly, as it builds on full years. Although the section calculates the loss of human capital and output to the economy as a whole, each individual who serves in the army bears these losses personally. The reason is that these people spend fewer years in the labor market until retirement and thus earn a lower lifetime income.

The losses due to conscription are not only because people work fewer years, but also because the years they miss are of highest productivity. To understand this, note that over the years, workers increase their human capital due to two processes. One is studying in colleges or universities, which increases productivity (as shown both in chapter 3 and in more detail in chapter 13). Human capital increases over time also by acquiring experience, by moving from one job to another, which fits the worker better, and by moving to better tasks within the same workplace. Wage regressions, which study the effect of different variables on wages across samples of workers, capture these two effects by the variables "years of schooling" and "age." Figure 6.1 presents the average smoothed graph of monthly wages over the ages 18 to 67 of Israeli Jewish men. The wage profile is shown by the solid curve.

Figure 6.1 shows that wages of men rise significantly over the years, from 4,000 NIS at age 22 to 14,000 NIS at age 48. The dashed curve in figure 6.1 describes a hypothetical wage profile of Jewish men if they did not go into the army and instead began their work path at age 18 instead of at 22. Actually, this curve reflects the situation in the United States, where men graduate from high school at age 18 and go to college or to work.

According to appendix 2, human capital is proportional to the wage earned, so the two curves in figure 6.1 actually measure the human capital of Israeli men with and without conscription. Hence, the horizontal gap between the two curves is the loss of human capital for each cohort. Figure 6.1 shows that this loss of human capital is large, and it extends from the years of service until the age of 48. We can therefore use this figure, together with data on the number of people who work in each cohort and the percentage of them who served in the army, to calculate the aggregate loss of human capital in the economy.

Figure 6.1 assumes that the entry age to the work path of young men is 22, which is a longer delay than 3 years of service. This extra delay has several reasons. Many recruits serve longer, either because they take pre-military courses to get a specific military job, or because they become officers. Many attend a preparatory program the year before service. Many enter the army at mid-year, which further delays entry to higher education. The main additional delay to the work path is the famous trip abroad after the service. The trip lasts a year, including the temporary work required to finance it, and is a tradition that almost everyone follows.

Another support for the assumption that men lose at least 4 years is from data on wages for younger workers. Monthly salaries in ages 18–21 are very low, averaging 2,200 NIS, and rising

at a slow rate of 220 NIS per year. Only from the age of 22 onward do wages rise much faster, by 770 NIS a year. Wages of women rise faster from age 18, by 450 NIS a year, since half of the women do not serve and are already in the labor market. Another supporting statistic is the late age of entry to universities in Israel. The median age for men is 24.4 and for women is 22.9.

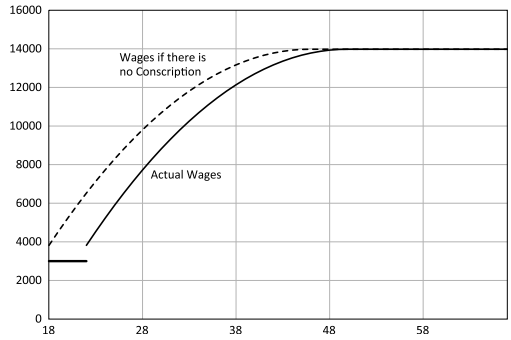

FIGURE 6.1. Average monthly wage of Jewish men aged 18–67 years, 2011 (NIS).
Data are from Central Bureau of Statistics (2011a), calculated by the author. The figure smooths wages by fitting a polynomial of third degree to the data.

Another assumption behind figure 6.1 is that the human capital of conscripts during their service is equal to 3,000 NIS. According to the data above, the average monthly salary for ages 18–21 was 2,200 NIS in 2011, but this reflects salaries of men who did not enlist. Since the army is filtering recruits by quality, wages of non-recruits are lower than the potential wages of recruits. This leads me to assume that the potential value of human capital of male conscripts is around 3,000 NIS. I have also drawn a similar diagram for women, except that wages of women are lower, and their curve shifts to the left by 3 years rather than by 4 years.

The main assumption in figure 6.1 is of course that the curve shifts in parallel to the right when people enlist into the army. In other words, it assumes that people do not gain or lose human capital in their military service, except for the loss of time. Many challenge this assumption by claiming that the military service contributes to human capital of conscripts in various ways. I cope with this challenge in two ways. First, by showing that the contribution is not so large, and second, by showing that there are cases in which the loss due to conscription is even larger than shown in figure 6.1. Thus, using the loss in figure 6.1 is a reasonable average loss.

Some observers claim that military service helps conscripts to acquire discipline, social skills, and ability to participate effectively in teamwork. This is true, but it raises the question whether people would not acquire similar skills in the usual path of university and a job afterward. To examine scientifically the contribution of the military, one has to compare people who served in the army with those who did not. Currently, we cannot conduct such a study in Israel for two reasons. First, data on individual military service are not available in surveys. Second, such a comparison suffers from selection bias, since the military screens recruits by quality. There is one study, which effectively conducted such a comparison, but in the United States and not in Israel. In the early 1970s, the US military used a lottery to draft conscripts for the Vietnam War. Angrist (1990) compared men who served because of the lottery with those who did not. He found that the wage curve of white males who served was a parallel shift of the wage curve of those who did not. Thus, the study found that the contribution of the service itself to human

capital was not significant.

Others claim that service in high-tech units, like the famous Israeli 8200 unit, contributes much to those who serve in these units. However, the stories of graduates of 8200 immediately kidnapped by high-tech start-ups are a bit outdated. Today, most of those who served in such units do not give up on higher education. A recent report describes the high demand by the high-tech sector for graduates with degrees in technical subjects.[4] It shows that the Israeli high-tech sector has become a large established industry that no longer can rely on experience from military training and requires formal higher education.

Finally, there are important cases where the loss of human capital due to conscription is even higher than what figure 6.1 implies. This is the case, for example, with Israelis who continue to study in universities beyond their first degree, especially PhD students, who pursue a research career. Due to their years in the army, they are likely to begin their PhD studies when they are already married and may even have children, which prolongs their studies. Hence, Israelis finish their PhD degrees 8 years after they obtain their bachelor's degree, while in the United States and in Europe, it takes only 5 or 6 years.

I calculate the aggregate loss of human capital as follows. For each age group, I multiply the vertical distance between the two curves in figure 6.1, the individual loss of human capital, by the number of men in this age group who work. Then I multiply that sum by the share of men in that cohort who served in the army.[5] I also correct for the possibility of incomplete military service, as 5 percent of men leave the military every year. The calculation for ages 18–21 is slightly different, as instead of the number of workers, I use the number of young men who serve in the army at that age. I do a similar calculation for women.

The total loss of human capital for all age groups younger than 50, men and women, is 18,559 million NIS in 2011. This is 5.7 percent of the total wage bill in 2011, so this is the relative loss of human capital. As appendix 2 shows, human capital is proportional to GDP, so output could be 5.7 percent higher. Note that the calculation takes into account not only loss during military service but also in the following years. The calculation also takes into account not only the direct loss of human capital on GDP but also the indirect loss due to lower physical capital, as explained in chapter 3. Although the effect of conscription is on the level of GDP and not on its rate of growth, an annual loss of 5.7 percent of GDP is significant and large.

Summary of Costs

This section sums up the costs of the conflict, in addition to the direct defense costs, updating the seminal paper of Berglas (1986). However, before turning to additional costs, three clarifications are needed with respect to the direct defense costs: the distinction between the defense budget and ex post defense expenditures, the role of military pensions, and an international comparison of defense costs. First, the defense budget does not include the secret services, mainly the Mossad (operates outside the country, similar to the US CIA) and the Israel Security Agency (in Hebrew, "Shabak," which operates in Israel and in the occupied territories). At some time during the year, a secret sub-committee of the Knesset Finance Committee allocates the budgets of these services from the "general reserve" to the Ministry of Defense. Thus, by the end of the year, defense expenditures include these costs plus other unplanned costs. In 2011, the original defense budget was 54 billion NIS, or 5.8 percent of GDP. Defense spending at the end of the year reached 62.4 billion NIS, or 6.7 percent of GDP. As there were few defense events in 2011,

one can deduce that spending on secret services was close to 1 percent of GDP.

Second, in the past, military personnel received unfunded defined benefit pensions, which had been part of the defense budget since the 1990s. Beginning in 2003, newly hired army professionals enroll in a defined contributions system. Those who joined earlier are still covered by the unfunded pension. Hence, these pension costs are still high, especially as military personnel retire early, in their 40s. However, the Central Bureau of Statistics calculates defense costs according to international criteria, so they do not include these pension payments, but consider instead the contribution that would have prevailed if all military personnel had defined contribution pensions. Thus, according to the Central Bureau of Statistics, in 2011 defense costs were 6.2 percent of GDP, while the actual cost, including budgetary pension payments, was 6.7 percent of GDP.

Third, in terms of international comparison, defense expenditures in Israel are very high, even at their low levels, when the conflict is narrow. While defense expenditures in Israel in 2018 are 5.5 percent of GDP, the average across OECD countries is only 2.1 percent of GDP. Among OECD countries, the United States has the highest defense spending (3.2 percent of GDP); other countries pay much less. Defense expenditures in Belgium are 0.8 percent of GDP, in France 1.8, in Denmark 1.2, in Germany 1.0, in Italy 1.3, in Norway 1.7, and in Sweden they are 1.2 percent of GDP.[6] Most of these countries do not have conscription. Hence, even without the additional costs listed below, defense expenditures in Israel are very high relative to other developed countries.

The following is a list of additional costs to Israel of the conflict that are not part of direct defense expenditures. The list consists of three types of costs, as described in the first section of this chapter: costs paid by the government but not classified as defense costs, costs paid directly by Israeli citizens, and opportunity costs.

BUDGETARY COSTS NOT CLASSIFIED AS DEFENSE COSTS

- Conscripts receive a special grant after their service to help them settle into civil life. The grant is divided to two payments, one immediate and one within 5 years. The grant varies between 20,000 and 40,000 NIS. These grants are not part of defense costs, since those who receive them are civilians. However, they are clearly a cost of the conflict. In 2011, the grants amounted to 1.6 billion NIS.
- The cost of the Israel Atomic Energy Commission in 2011 was 145 million NIS. These are mainly costs of a small experimental reactor in Nahal Soreq, operated by the army but not part of the defense budget. Because the information is classified, I could not find or estimate the cost of the Dimona Reactor, which is clearly a defense cost.
- The Coordination of Government Activities in the Territories (COGAT) is a military unit that handles the civil administration of the Palestinian Territories. It is not part of formal defense costs, because it deals with civilians. In 2011, it spent 184 million NIS.
- Part of the police activity is for security and is related to the conflict. Such is the activity of the Israel Border Police (MAGAV is the Hebrew acronym) in East Jerusalem and in the occupied territories. Service in the Israel Border Police is even an alternative to army conscription. Another police unit that focuses on the conflict is the Counter-Terror and Hostage Rescue Unit. The budgets for these activities are in the Ministry of Internal Security. I was unable to estimate them separately.

COSTS PAID BY CITIZENS

- Most civil defense spending is the responsibility of civilians themselves. In the past, every apartment building had to include a joint shelter. Since 1991, the law requires every apartment with at least two bedrooms to have a sheltered room, called “Sheltered Apartment Space” (MAMAD is the Hebrew acronym). The cost of construction of such a room in 2011 was 100,000 NIS, while the cost of a standard room was 40,000 NIS. Hence, the additional cost of a sheltered room was 60,000 NIS. In 2011, Israelis bought 45,500 new apartments with sheltered rooms, and hence the total cost of this civil defense was 2.73 billion NIS.
- Another cost of the conflict, not in the defense budget, is of security guards. They usually stand in entrances of public spaces, like shopping malls, restaurants, and office buildings, and their role is to guard against hostile attacks. The use of such guards became widespread during the Second Intifada. While there were only 10,000 guards in 1995, their number increased to 40,000 afterward. In 2011, there were 39,000 security guards and 6,000 administrative personnel in the security companies. Assuming that security guards earn the minimum wage and the administrative personnel earn the average wage, their total cost in 2011 was 3.4 billion NIS. Note that some security guards operate in government offices, and their costs fall on the related ministries, but not on defense.
- Israel keeps large reserves of fuel and food for a sudden war. Israelis finance these reserves directly by special excise taxes on fuel and food. The annual cost of these reserves in 2011 was 201 million NIS.

OPPORTUNITY COSTS

- The largest opportunity cost is the loss of human capital due to conscription, calculated in the previous section. In 2011, this cost reached 53.4 billion NIS, 5.7 percent of GDP.
- Another opportunity cost related to conscription is a result of the gap between the potential market wage of conscripts and their actual cost to the military. The above estimate of the alternative wage for men of age 18–21 years is 3,000 NIS a month, and for women it is 2,000 NIS.[7] Military salaries differ between combat and non-combat soldiers, but the average monthly wage for male soldiers in 2011 was 900 NIS, and for female soldiers it was 500 NIS. The total amount of this alternative cost in 2011 was 3.79 billion NIS, which amounted to 0.4 percent of GDP.
- Use of land is also an opportunity cost, as the military pays no rent. According to Schiffer and Oren (2008), nearly half the land in Israel is under military control, for army bases and training areas. According to State Comptroller (2010), p. 39, the army holds 39 percent of the land in Israel fully and imposes restrictions on an additional 40 percent of it. Recently the army evacuated large areas in the center of the country to move to new training bases in the south. In the debate between the Ministries of Finance and of Defense on the compensation for this move, the Ministry of Finance estimated the value of this land to be 30 billion NIS, while the Ministry of Defense estimated it to be 90 billion NIS. Assuming that both parties exaggerated, we estimate the value of this land to be 60 billion NIS. In 2011, the ratio of rent to land value was 3.4 percent. Hence, the estimated annual cost of land is at least 2 billion NIS. The cost of using the large areas in the south, which is mostly desert, is difficult to estimate. Note that the cost of land is an opportunity cost for the

government agency Israel Land Authority, which controls 93 percent of the land in Israel and collects some rent for most of it.[8]

- Another opportunity cost, introduced by Berglas (1986), is lost output from casualties in the conflict. This is in addition to the direct costs of payments and treatment, as affected families receive much support, both financial and nonfinancial. Military fatalities reduced the number of employees in 2011 by 6,500, taking into account mortality rates and labor participation rates. Assuming that, on average, each of these casualties would have produced the average GDP per worker had they survived, the loss to GDP is 1.8 billion NIS. Similarly, civilian victims, 700 in number, account for an opportunity cost of 200 million NIS. Social Security payments to civilian casualties and their families, which are not included in the defense budget, amounted to 0.5 billion NIS in 2011. This calculation does not include lost output of injured soldiers, as it is hard to estimate, due to large variations in the severity of the injuries.

TOTAL SUM OF COSTS

Table 6.1 summarizes all the additional costs for 2011 together with the direct defense costs. It presents these costs both in NIS of 2011 and in percentages of GDP. As mentioned earlier, 2011 was quite average in terms of security events, so these expenses represent an average. Of course, in years of more clashes with the Palestinians, spending is higher. The costs in table 6.1 are clear costs of the conflict. I do not include in table 6.1 the cost of lower capital and output due to high risk of the conflict, described in chapter 4, as I cannot fully prove that this cost does stem from the conflict. However, it is a reasonable hypothesis, so I later discuss the overall cost including this additional opportunity cost, to get a more realistic picture of the overall costs of the conflict.

TABLE 6.1. Various defense costs, 2011

Cost	2011 prices (NIS billion)	Percent of GDP
Official defense expenditures	62.4	6.7
Loss of human capital due to conscription	53.4	5.7
Opportunity cost of conscription	3.79	0.4
Opportunity cost of land	2	0.22
Opportunity cost of military fatalities	1.8	0.19
Opportunity cost of civilian fatalities	0.7	0.07
Secured rooms	2.73	0.29
Security guards	3.4	0.36
Fuel and food reserves	0.2	0.02
Israel Atomic Energy Commission	0.15	0.02
COGAT	0.18	0.02
Post service fund	1.6	0.17
Total	132.4	14.13

Source: Data are from the calculations in the text and from Bamya, Wolfson and Zeira (2015).

As table 6.1 shows, the additional costs double the cost of defense, from 6.7 to 14.1 percent of GDP. If we compare total costs to income, which is lower than GDP, then if income was 799.5 billion NIS in 2011, total costs were 16.6 percent. Thus, after deducting the various defense costs, Israelis remain with only 83.4 percent of their incomes. Internationally, this is a

very high cost, compared to an average total cost of 2 percent of income in most developed countries. Hence, the cost of the conflict is very high in Israel, even in quiet times and even during the narrow Israeli-Palestinian conflict.

If we add to the costs in table 6.1 the much greater cost described in chapter 4, of lower capital and output due to risk, it adds 26 percent of GDP. Thus, the costs of the conflict can reach a high level of 40 percent of GDP. Of course, not all costs will disappear immediately once Israel ends the conflict. It will still have a relatively large army and there will be conscripts, though for shorter periods, and people will still build sheltered rooms. Hence, the net costs might be 30 percent of GDP, instead of 40 percent, which is still very high. Note that this table does not include costs of eruptions of the conflict, described in chapter 7.

Costs of the Conflict That Are Hard to Estimate

This section discusses four additional costs of the conflict that are very difficult to estimate and are therefore not included in table 6.1. The first is the cost of settlements in the occupied territories. The settlements receive support from the government through many channels, which is higher than the support given to ordinary Israeli towns and villages, and so it is hard to track. The second issue is the cost of the economic international boycott of Israel, organized by the Boycott, Divestment and Sanctions (BDS) movement. The boycott is just beginning, but it draws much public attention. The third cost, which is quite far in the future, is the damage to future economic relations with the Arab world, caused by the continuing conflict. The fourth is the opportunity cost of reserves.

HOW MUCH DO THE SETTLEMENTS REALLY COST?

Israel began to build settlements in the occupied territories as early as 1967, in the Golan Heights and in Gush Etzion, which is south of Bethlehem. The settlements have expanded since and today more than a half million Israelis live beyond the Green Line: 200,000 in East Jerusalem and 400,000 in the West Bank. The number of settlers in the Golan Heights is relatively small, 19,000. Public expenditures on settlements are usually higher than in communities within Israel, for several reasons. First, these are relatively small localities, dispersed over a wide area, which increases spending due to transportation and to missing returns to scale. In addition, many settlements are far from the business centers in Israel, and as a result, many settlers have public sector jobs in the settlements. The settlements also receive additional funding from the government to support their development and well-being, due to their political importance. It is impossible to find data on such funding in Israeli statistics, so it is hard to estimate it. However, a few recent studies made an effort to track these costs and estimate them.

The first study is OECD (2010). One of the main obstacles to entry of Israel to the OECD was the discrepancy in Israeli data between population and territory. Israel includes in its statistics the population of the settlements but not the other residents in the occupied territories.[9] Hence, once Israel joined the OECD, after massive pressure from the United States, the organization conducted this study to learn about the public funds that reach the occupied territories. According to OECD (2010), the population in the occupied territories was 775,000 in 2009, of which 265,000 were Palestinians from East Jerusalem and 510,000 were Israelis, who made up 6.8 percent of the population in Israel that year. The government spent 7.4 percent of its total expenditures on this population. Since Palestinians in East Jerusalem receive low public

support, it means that the settlers received more than their share in the population, but not much more. Hence, OECD (2010) found that the subsidies to the settlements were not too high.

There are two main caveats to this conclusion. One is that the study took into account only expenditures by the central government, while many funds to the settlements arrive from other parts of the public sector (mainly the Jewish Agency and the World Zionist Organization Settlement Division). The second caveat is that these costs do not include over-employment in the public sector in the settlements, explained above. According to another article in the same study, the contribution of settlers to GDP is less than 4 percent, while their share in the public sector is more than 11 percent, which is higher than their share in the population.

A second study, Hever (2013), tries to measure the subsidization of settlements over the years. He claims that we cannot learn much from the current support, due to lack of sufficient data and because much of the funding of the settlements were past investments in infrastructure. Because of the lack of data for all years, Hever used years for which data exist to calculate total support for the settlements over the years 1970–2008. He discounted all costs at 2008 in prices of 2007. Hever (2013) discusses the following main types of support:

1. **Agriculture:** The Settlement Division of the World Zionist Organization finances most investments in agriculture in the settlements. In 2000–2002, it invested 450 million NIS.
2. **Education:** Expenditures per student in the settlements are higher than in Israel, mainly due to special grants to teachers and to students' transportation. In 2003, these additional costs were 118 million NIS.
3. **Health:** Medical services in the settlements cost more than in Israel, partly due to a special subsidy to doctors. These additional costs accumulated until 2002 to 2 billion NIS.
4. **Housing:** The government subsidizes housing in settlements. Hever estimates this extra subsidy in 1990–1999 to be 3.4 billion NIS.
5. **Industry:** The government builds industrial areas. Such areas in the settlements receive higher support than similar zones within Israel.
6. **Local government:** Municipalities in the territories receive higher transfers from the central government than within Israel, up to twice as high per capita. Hever estimates this additional cost in the 1990s to be 2.7 billion NIS.
7. **Roads:** The settlements enjoy excellent roads, built mainly in the 1990s, after the Oslo Accords. In 1993–2002, the government invested 1.47 billion NIS in road construction.
8. **Tax exemptions:** Residents of settlements enjoy a large exemption from income tax. The lowest estimate for this exemption in the years until 2003 is 1.7 billion NIS.
9. **Water:** Israel built a large, separate water system for the settlements, which uses the Mountain Aquifer (reducing the water left for Palestinians). The system cost 560 million NIS in 1994–2003.

Hever (2013) finds that the discounted sum of the additional transfers to the settlements in 1970–2008 was 105 billion NIS at 2007 prices. To estimate the annual cost of these transfers, mostly past investments, I calculated interest payment on this stock, without taking into account new costs. It is equal to 3 billion NIS at 2007 prices, which were 0.5 percent of GDP in that year. This is a significant cost, but not too high in comparison to the costs in table 6.1. Note also that although past spending on the settlements, both investments and flow transfers, increased the public debt and thus increased interest payments, we should be careful when including this cost in the list. The reason is that this debt is already much smaller, through low fiscal deficits since

1985 and through lower interest rates today. Hence, the present cost of past investments in the settlements is much lower than 0.5 percent of GDP and is harder to measure. Hence these costs are not included in table 6.1. However, one can still claim that since the settlements are playing a significant role in the continuation of the conflict, being a central point of disagreement between Israelis and Palestinians, their indirect contribution to the cost of the conflict might be rather large.

HOW COSTLY IS THE BOYCOTT?

In recent years, the movement for BDS against Israel and the settlements has gained momentum, in Europe, the United States, and elsewhere. Although the boycott is limited in scope, it causes great concern among Israeli policy makers and among supporters of Israel abroad. The Israeli government created a special ministry, Ministry of Strategic Affairs, which coordinates the global struggle against the BDS. In my opinion, the boycott does not impose a serious economic threat to Israel yet, but it carries a heavy political cost.

To understand the potential impact of the boycott, we should compare it to the historical precedent of the Arab boycott, which began in 1948 and collapsed after the 1993 Oslo Accords. The Arab boycott outlawed Arab trade with Israel, but more importantly, it boycotted global companies that traded with Israel and was quite effective. For many years, Israelis could not drink Coca-Cola, eat at McDonald's, or drive Japanese cars. However, the Israeli economy developed well despite the Arab boycott. Israel found ways to overcome it, like trading with small companies, such as the car producer Subaru, which worried less about its business with the Arab countries. Israel also coped with the boycott by diversifying its foreign trade, which can help it nowadays as well. In 2010, 32 percent of Israeli exports went to Europe, 37 percent to North and South America, 24 percent to Asia, and 2.5 percent to Africa.

There have not been many studies on the previous Arab boycott of Israel. One such study is Fershtman and Gandal (1998), which estimates its welfare costs for car purchases. Israel has always imported cars, except for a one-time attempt to produce an Israeli car. The study examines the cost due to reduced diversity and competition. It finds that in terms of 1995 dollars, the loss was $364 million, which amounted to 0.3 percent of GDP. Clearly, this was only in the sector of automobiles, and there were additional costs in other sectors, but it seems that the total costs were not too high and did not exceed 1 percent of GDP.

Despite these results, the potential damage of the current boycott should not be underestimated. Israeli foreign trade can be hurt significantly if the boycott reaches large global ports. The International Dockworkers Council has already discussed once the possibility of not servicing Israeli ships. Due to American pressure, the council did not reach a decision, but things might change in the future. However, currently the boycott does not seem to have a significant economic effect. Interestingly, the annual average spending of the Ministry of Strategic Affairs, which combats the BDS, was 80 million NIS in recent years, which is 0.006 percent of GDP.

At present, the main cost of the BDS is political rather than economic. The old Arab boycott reflected worries of large corporations about losing Arab markets. Israelis could ignore these corporations. This is no longer the situation with the current boycott, as it reflects widespread authentic public pressure in many countries. The current boycott is a signal of moral indignation at Israel and its policies. The fact that increasing numbers of people question the morality of their policies disturbs Israelis. It may not translate immediately to a financial cost, but it is disturbing.

Israelis love to travel abroad, especially to Europe, and like to feel welcome. This feeling has eroded in recent years.

FUTURE ECONOMIC RELATIONS WITH THE ARAB WORLD

The continuation of the conflict may create another cost, which may look small today, but might become significant in the future, of diminished economic relations with Arab countries. Hostility toward Israel in these countries is high, as the conflict continues. This hostility might hurt future economic trade with Arab countries, even after peace agreements, as manifested by the two peace agreements of Israel with Egypt and Jordan. Trade with these two countries is very small. In 2017 Israel exported $58 million to Jordan and $65 million to Egypt. In comparison, Israel exported $600 million to Greece, a country with a similar GDP.

Trade with these two countries is not only small but also very volatile. Every confrontation between Israelis and Palestinians and every tension in general hurts trade with Israel. The Second Intifada in the early 2000s hurt trade with Egypt significantly. The events of the Arab Spring in 2011 significantly reduced Israeli exports to both countries. The Arab Spring hit Egypt directly and Jordan indirectly, as the latter absorbed millions of refugees from Iraq and Syria. The main reason for this volatility is the deep hostility to Israel in the Arab population, fueled by the ongoing conflict. Hence, despite formal peace agreements, the public in both countries strongly opposes purchasing Israeli goods, especially in times of conflict.

Many Israelis dismiss such concerns, as the Middle East is underdeveloped, so Israel may not gain much from economic ties with it anyway. However, such claims ignore the lesson that there is nothing permanent in the world. Forty years ago, no one predicted that China and India would experience such accelerated economic growth. The Middle East may go through a similar development. If that happens before peace is established, it would add a significant cost to the conflict. Note that trade with Arab countries is advantageous to Israel due to their geographical proximity, which reduces transport costs, and due to cultural closeness as well.[10]

OPPORTUNITY COST OF RESERVE SERVICE

Israelis go into reserve service for many years after ending their conscription. Absence from their jobs for extended periods is another cost of the conflict. However, the government compensates them for the lost income, and this compensation is now part of the defense budget. Recently reservists have also received additional payments for their service, especially if it is long. Actually, this compensation is not full, both because nonemployees receive only a partial compensation and because payment does not cover the reduction in productivity of fellow workers, due to complementarities in the workplace. However, the scope of this cost is small. In 2016, only 126,000 Israelis served in the reserves for more than 20 days. Assuming they served 25 days on average, the output lost was 0.3 percent of GDP. Clearly, the noncompensated part of this loss is much lower and is hard to estimate, so I do not include it in the list of additional costs shown in table 6.1.

Are There Economic Benefits to the Conflict?

So far, this chapter has dealt with various economic costs of the Israeli-Arab conflict, direct and indirect. We next examine whether the conflict might have some economic benefits.

US AID TO ISRAEL

American aid to Israel, the large part of which is military aid, would not have arrived without the Israeli-Arab conflict. The question of whether Israel receives this aid due to its fine democratic regime, due to its strong political lobby in the United States, or due to its strategic role as an important ally of the United States in the region, is, of course, outside the scope of this book. In any case, the aid to Israel increased significantly only after its victory in 1967. This fact supports the conclusion that it is a by-product of the Israeli-Arab conflict and is therefore a significant benefit of the conflict. Figure 6.2 presents US aid to Israel over the years, in percentage of GDP. Although aid had begun in 1949, with a development grant of $100 million, figure 6.2 starts only in 1955, since in earlier years it is difficult to calculate Israeli GDP in dollars, due to distorted exchange rates. Figure 6.2 also presents total defense costs by the dotted curve.

Figure 6.2 illustrates that US aid increased significantly in 1971, remained high until the early 1980s, and since then has declined as percentage of GDP. Hence, the aid increased after the intensification of the conflict and declined relative to GDP after the peace with Egypt. There are two major deviations in this graph. In 1979, aid was close to $5 billion, even greater than defense spending in that year. This was the cost of construction of two military airfields in the Negev Desert, which replaced two airfields evacuated from Sinai as part of the peace agreement. The United States built these airfields by itself, so the sum did not show up in Israel's defense spending or in the unilateral transfers of that year. The second deviation was in 1985–1986, when the United States gave a special 2-year grant of $3 billion to help Israel's economic stabilization. Chapter 9 describes this stabilization program and the contribution of this US aid in detail.

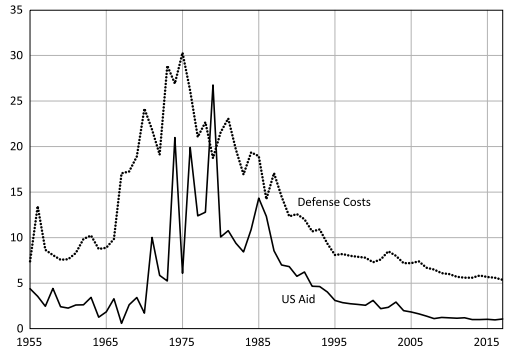

FIGURE 6.2. US aid to Israel and defense spending, 1955–2017 (percent of GDP).
Data on US aid are from Sharp (2014, 2018). Data on Israeli GDP in dollars are from Central Bureau of Statistics (1981, table 9.11; 1996, table 6.1; 2008, table 14.2; 2018c, tables 14.2, 17.10). Data on defense expenditures are the same as in figure 5.1.

Figure 6.2 shows that the size of US aid relative to GDP has been significant, but not too high. In the years of the high conflict, 1967–1978, the aid was on average 8.5 percent of GDP. During that period, defense costs were on average 22.9 percent of GDP. Hence, even when the aid was high, it covered less than half of the defense costs. Furthermore, it declined significantly over the years relative to GDP, and in 2010–2017 it was on average only 1.1 percent of GDP. This amount is rather small—less than a fifth of the total direct defense costs.

MILITARY EXPORTS

Israel is a large exporter of military goods: drones, missiles, light arms, and more. Clearly, one of

the main reasons for the worldwide demand for these products is that Israel has a rich military experience, due to the conflict. In other words, Israeli military equipment has been tested in battle. The question is whether we can estimate the size of this reputational advantage. In general, data on military exports are confidential, as most exporters are not private, as in the United States, but instead are government companies.[11] Recently the government released some data on military exports, which enable us to get a rough estimate of this "reputational benefit" of the conflict.

In 2010, Israeli military exports were $7.4 billion, out of total exports of $81.7 billion. Hence, military exports were 3.2 percent of GDP. Clearly, not all this amount is due to the conflict. Even if Israel did not produce military exports, it could use the inputs to produce other goods and services. This should remind us of the late 1980s, when cuts in military industries released many skilled workers, who built the high-tech sector in Israel, as described in chapter 4. Hence, reputation is only part of the $7.4 billion, and even if we assume boldly that it is a third, the reputational benefit of the conflict to military exports is about 1 percent of GDP.

SPILLOVER TO THE HIGH-TECH SECTOR

Another potential benefit of the conflict is the experience gained by many young conscripts, who serve in high-tech units, like 8200, and later join high-tech companies. Here I try to estimate this spillover effect. As the second section in this chapter demonstrates, service in such units is not a substitute for higher education. Hence, such service can be at most equivalent to 1 year of tertiary education. Thus, an upper bound to the increase in human capital is 8 percent, according to table 3.1 in chapter 3. Even if all workers in high-tech (around 37,000 in 2018) served in such units, the value of this human capital spillover is around 1 billion NIS, which is much less than 0.1 percent of GDP.[12] This estimate is an upper bound of this effect. In addition, this subsidy to high-tech is highly inefficient. The army invests much in training these young people and uses them for relatively short periods. It does so to gain the best minds in each cohort, but it is still inefficient. Finally, economists are still undecided on whether subsidies to R&D are desirable at all.[13]

BENEFITS FROM EXPLOITATION OF THE TERRITORIES

Many observers argue that one of the reasons Israel keeps the territories is that it gains considerable economic benefits from the occupation. Although this claim sounds a bit like a conspiracy theory, it is worth examination. Hever (2013) lists various ways in which Israel used to exploit Palestinians and their territories. One was by collecting Social Security contributions from Palestinian workers without paying benefits to them later in life. Second, Palestinians who worked in Israel had to set aside part of their wages for security purposes, which actually financed supervision over them. Third, Palestinian workers paid fees to the national labor union Histadrut, but they benefited little from it. Fourth, Israel utilizes land and water resources in the occupied territories, especially for the settlements. Fifth, wages of Palestinian workers are lower than wages of equivalent workers in Israel, due to lack of employment opportunities in the territories. Sixth, the Palestinian market is a captive market for Israeli producers, and so most Palestinian imports are from Israel. One can claim that as a result, Israeli producers who specialize in exporting to Palestinians may generate above-normal profits.

These are indeed potential benefits for Israel, but a careful examination reveals that they are

not so large. First, since the 1990s, the number of Palestinian workers in Israel declined steeply, so their possible exploitation is quite small. Second, Israeli exports to Palestinians might be large relative to Palestinian incomes, but they are very small relative to Israel's exports to other countries. In 2017, total Israeli exports to the Palestinian Authority were $4.3 billion, while total Israeli exports were $103.3 billion. Hever (2013) claims that even if in the early years of the occupation, benefits were higher than the costs of controlling the territories, this changed over time and especially since the First Intifada, when the costs increased and outweighed the benefits.

THE MILITARY AS A TOOL OF UPWARD MOBILITY

In many countries, military service plays an important role in upward social mobility. People from the lower classes, who serve in the army and follow a military career, move up in the ranks, and then retire and adopt a civil career with much improved initial conditions. A famous historical example were the Scots, many of whom served in the British Army to escape the relative poverty in Scotland. The Israeli Army played a similar role for many years. In general, military service helped mix young people from middle-class Ashkenazi families with those who came from poor neighborhoods in big cities, or from Development Towns, called "Second Israel," who were usually from Mizrahi families. This meeting in military service of people from different classes and different ethnic origins made a significant contribution to advance the Israeli "melting pot" and contributed to national solidarity.

Furthermore, the military service also helped many people from poor backgrounds to move upward socially and economically, first by learning about options and possibilities, but also by choosing to stay in the professional army. The army in itself was a good-paying and respectable career, and when they retired, around the age of 45, they could pursue a second, much improved career outside the military. The army not only helped them develop a career but also created networks across social origins, which became helpful later in life.

However, service in the Israel Army has changed significantly in recent decades, especially during the narrow Israeli-Palestinian conflict. Youth from upper classes serve less in socially mixed combat units, like tanks or artillery, as these became smaller. Instead, they go to Intelligence and similar high-brow units, which are more homogenous socially. Simultaneously, units that deal with maintenance of the occupation of Palestinians, like Regional Brigades or Border Police, attract mainly youth from lower classes. Therefore, there is less mixing in the military, which reduces upward mobility. In addition, conscripts make up a smaller share of the population nowadays, due to more intensive screening. As a result, more kids from low social classes are not serving at all. This further reduces the role of the military in social upward mobility.[14]

SUMMARY OF BENEFITS

This section demonstrates that the various benefits of the conflict are small relative to the costs. The current benefit of US aid is around 1 percent of GDP. The value of the "tested in battle" reputation for military exports is around 1 percent of GDP as well. The subsidy to the high-tech sector through service in technological units is much smaller. The direct benefits from the territories of using land and water are mostly exhausted, and the benefit of exporting to a captive market is less than 1 percent of GDP. Hence, the sum of benefits described in this section is less

than 5 percent of GDP. It is much lower than the costs of the conflict of 14 and even 40 percent of GDP, if we add the cost of low capital and output due to risk.

War and Peace: An Economic View

This chapter expands the analysis of the costs of the Israeli-Arab conflict in its current narrow phase and shows that the full costs are much higher than the formal defense costs. Can this analysis affect the long-run Israeli dilemma between war and peace? Deliberation on this dilemma should require a full understanding of the various costs and benefits of each choice. It seems that the Israeli public is not fully aware of many of these economic costs. This holds mainly for the two opportunity costs, one due to loss of human capital because of conscription and the other due to low capital accumulation because of high risk. These unobserved costs are huge, and this book is the first to estimate them and put them on the public agenda.[15]

I should add that even if Israel reaches a peace agreement with the Palestinians and the rest of the Arab countries, these costs would not become zero. We can assume that over time, conscription will still be general but shorter and will last 1 year only. Then the loss of human capital will be 1.3 percent of GDP.[16] Hence, Israel will gain 4.4 percent of GDP. Similarly, defense spending will decline, probably to half of its current size, to 3 percent of GDP. Some other costs will remain, like sheltered rooms. However, the decline in risk will be significant, and Israel will be able to reduce much of the gap in output with the developed countries. Hence, we can estimate that some years after reaching peace agreements, the costs described in this chapter may decline to around 10 percent of GDP. This will result in a significant rise in income by 30 percent.

Finally, this book describes the costs of the conflict to Israelis, as its focus is the Israeli economy. However, the costs of the conflict to Palestinians are much higher. There is no full summary of these total costs, but studies have been done on one central economic cost: the lack of economic growth. A study of the Aix Group, by Finkelstein et al. (2015), shows that Palestinian GDP per capita has not grown significantly since the beginning of the implementation of the Oslo Accords in 1995 and that the main explanation for the lack of growth is the conflict and the occupation. The high risk deters investment drastically, and the barriers to mobility in the Palestinian area reduce productivity significantly.

1. Chapter 7 introduces another cost of the narrow conflict, as outbreaks with the Palestinians cause recessions.
2. Some Arabs, mainly Druze and Bedouins, serve in the army. A few Ultra-Orthodox men serve as well.
3. I am referring mainly to “development accounting.” See the survey by Caselli (2005).
4. See Council for Higher Education (2018), pp. 32–35.
5. The data on annual recruitment rates for men and women are from the following sources: Almassy (2012), Berda (2007), S. Cohen (2007), Mei-Ami (2007), and State Comptroller (2002). I calculate data for missing years by interpolation.
6. See OECD (2019b), table 2.30.
7. The Committee for Shortening Conscription (2006) added to this wage 26 percent of additional cost of taxation. Since I am interested in the net cost of the conflict, I do not add this tax, as it goes to the government anyway.
8. Public land was partly purchased by Jewish donations prior to 1948, but most of it is in areas which Palestinians left in 1948.
9. Except for East Jerusalem and the Golan Heights, which were annexed unilaterally.
10. A study of the Aix Group, by Abu Bader, Khatib, and Zeira (2012), presents suggestions for increasing trade after reaching a comprehensive peace.
11. Even private Israeli companies that produce military equipment, like Elbit Systems, need government authorization to export and usually operate under secrecy.
12. Annual wage in high-tech is 270,000 NIS. See Central Bureau of Statistics (2019), table 17.10.

13. See Boldrin and Levine (2002) and Zeira (2011).

14. See Levy (2007).

15. The Ministry of Finance is using my calculations of the loss of human capital and output due to conscription in its effort to shorten conscription.

16. This calculation assumes that after service of 1 year without armed confrontations, Israelis might not feel the urge to travel abroad for a whole year after the army service, as they do now.

Lessons from Part II

The conflict between Israel and the Arab world is 100 years old and has had large effects on the Israeli economy. The conflict changed over time, from narrow to wide and then back to narrow, and this variation helps us study its effects on the economy. The following is a list of the main lessons one can draw from the Israeli experience:

1. The conflict reduces output, as conscription delays entry into the labor market and causes loss of human capital. This effect is quite significant, as lost output exceeds 5 percent of GDP.
2. The conflict also reduces output because investors face a high risk premium, which depresses capital accumulation. This effect manifests itself by the low capital-output ratio in Israel. This effect accounts for a loss of potential output of 26 percent of GDP.
3. If the conflict is wide, so that fighting involves conventional armies, the conflict can become very expensive, especially during times of intensification. It might even lead the country to a severe fiscal crisis and even to a high inflation, as happened in Israel. Furthermore, the rise of defense costs during a wide conflict increases the deficit in the balance of payments, as shown in chapter 8.
4. A country in conflict with a small population can overcome this constraint by a large reserve force, as has been done in Israel, Switzerland, and a few other countries. However, when the conflict erupts, this can become very costly to the economy, if many people leave their jobs for extended periods. This happened in Israel in 1967–1980, and it had a large fiscal cost, as the government was obliged to support businesses significantly.
5. Even if a country has a narrow conflict, and it fights militias and not conventional armies, so that direct military costs are low, the conflict can be quite costly. There is still loss of output due to conscription and to risk. Furthermore, conflicts with militias harm aggregate demand, mainly investment, consumption, and tourism, so they can cause deep recessions, as shown in chapter 7.
6. Interestingly, this book shows that the conflict did not have a significant effect on the rate of growth of Israel. The conflict also did not delay its development from a poor country in the early years of the twentieth century to one of the developed countries 50 years later. However, the conflict does have a significant effect on the level of output and of income. Israel could have 30 percent higher income without the conflict, due to lower conscription and lower risk. An annual loss of around 30 percent of potential income is significant.

PART III

Economic Lessons from a Turbulent History

Readers of this book are already familiar with the unique history of Israel. It is an immigration country that is embroiled in a violent conflict, receives significant aid from abroad, and was a fast-growing country, at least in its first 25 years. Furthermore, these events were strongly manifested and significant. The immigration wave of 1948–1950 doubled the population of the young state. The immigration wave of the 1990s increased the population by 20 percent. The intensification of the Israeli-Arab conflict after 1967 increased military costs to more than 20 percent of GDP and for a few years even to 30 percent of GDP. Unilateral transfers from foreign governments (those of Germany and the United States) and Jewish donations were very high, between 15 and 20 percent of GDP in most years before 1990. Israeli economic growth in 1950–1973 was extremely fast compared to the international average, as GDP per capita increased at an average annual rate of 5 percent.

When such big shocks hit a country, it enables us to identify their effects in a way that is statistically significant. This is similar to conducting experiments in macroeconomics. It is usually impossible to run such experiments, both for practical and ethical reasons. However, observing the economic history of a country like Israel, hit by such large shocks, enables us to overcome this limitation. Thus, this part of the book shows how to use the unique turbulent history of Israel to test some important macroeconomic theories.

This use of the economic history of Israel shows not only how interesting this specific country is, but also how it can serve as an interesting example of how to learn from economic history. In addition to teaching us about economics in the past and using economics to improve our understanding of overall history, here economic history serves an additional role. It shows how it can teach us about economics in general, by using history and historical data to test economic theories and to gain better understanding of economic mechanisms. Part III of the book applies the economic history of Israel to learn more about business cycles, the balance of payments, inflation, and the trade-off between inflation and unemployment.

Chapter 7 studies business cycles, which are economic fluctuations around the trend of growth. It finds that Israel has had six major recessions throughout its history, not counting the current Covid-19 recession. The causes of all six recessions were negative shocks to demand, and the exit from all six recessions was due to increased demand, or even positive demand shocks. Hence, business cycles in Israel conform with the Keynesian theory that the main driver of business cycles are shocks to aggregate demand. Interestingly, chapter 7 shows that almost all Israeli business cycles were not synchronous with global business cycles. The shocks that drove them were domestic. This is unique to Israel and is a result of its large shocks.

Furthermore, chapter 7 shows that the first 35 years of the state had few recessions, which were rather short. This is because these were years of high aggregate demand, due to

immigration, rapid economic growth, and large military expenditures. Interestingly, the chapter also shows that the narrow conflict with the Palestinians has an opposite cyclical effect to the wide conventional conflict. Instead of costly wars with large military demands, outbreaks with the Palestinians reduce aggregate demand and tend to cause recessions.

Chapter 8 shows how the "intertemporal approach to the balance of payments," which is the newest theory of open economies, receives very strong support from the Israeli experience. This theory, developed in the early 1980s, is an application of the theory of "consumption smoothing." It claims that trade deficits emerge when the public chooses to consume today more than it produces, due to expectations of higher income in the future. Chapter 8 applies this theory to the events of rapid economic growth, intensification of the conflict, large waves of immigration, and foreign aid. It shows that these events affected the Israeli balance of payments according to the theory. Since these events were exogenous to the balance of payments, this constitutes a good test of the theory.

Chapter 9 examines another theory, the inflation tax model. The theory claims that high inflation is a result of financing part of the public deficit by printing money. The model then makes predictions about the equilibrium rate of inflation and how it reacts to various changes in the economy. It shows that a decline in demand for money, and an increase of the deficit, both in the present and in the future, raise the rate of inflation. In the 1970s and 1980s, Israel experienced high inflation. It began with 50 percent annually in the early 1970s, jumped to 120 percent in 1979, and then to 400 percent in 1983, until the stabilization in 1985. Chapter 9 shows that all these steps of the Israeli inflation fit very well with the theory of inflation tax under rational expectations. Here again, the ability to support this theory was possible due to the large shocks Israel experienced. In that period, the deficit was around 15 percent of GDP, of which money printing financed around one-third.

The stabilization plan of 1985 still left Israel with an annual rate of inflation of 20 percent. It took almost 15 years to lower inflation to less than 2 percent and reach price stability in 1999. This long disinflation highlights two important theoretical issues: the Phillips curve and the independence of the central bank. According to the Phillips curve theory, the economy needs to go through some unemployment when it reduces inflation gradually. Indeed, Israel experienced unemployment episodes in the early 1990s, with the immigration from the ex-Soviet countries, and during the 1997–1999 recession, which followed the assassination of Prime Minister Yitzhak Rabin. These two episodes of unemployment enabled the Bank of Israel to lower inflation and reach price stability. However, the Bank had to apply some unpopular policies, and could do this only because of the growing independence of the bank. Chapter 10 tells the story of this long disinflation and the lessons from it for these two theories.

7

Business Cycles in Israel

Business Cycles and Their Causes

Chapter 2 shows that Israeli economic growth went through two main phases. One was rapid catching up, in 1950–1972, when GDP per capita grew at an average annual rate of 5.5 percent. After 1973, growth slowed, and GDP per capita has grown at an average annual rate of 1.7 percent. Figure 7.1 plots GDP per capita together with dotted trend lines before and after 1973.

Figure 7.1 shows that Israel has experienced several economic fluctuations around the trend, also called "business cycles." Periods when output growth is slower than the trend are known as recessions, while periods when output growth is faster than the trend are booms, or expansions. Figure 7.1 directs our attention to a few noticeable business cycles in the history of Israel. One is the recession in 1952–1953 and the quick recovery in 1954. The second is the recession in 1966–1967 and the following boom. Figure 7.1 also shows a slight recession in the years 1996–1999. This recession ended in 2000, but not for long, as then came a deep recession in 2001–2003. A later short recession appears in 2009. Below, we identify one more recession by using additional data, mainly on unemployment. Unlike the United States, Israel does not have an independent public agency that dates business cycles, such as the National Bureau of Economic Research (NBER). Hence, I devote much of this chapter to date the Israeli business cycles.

Figure 7.1 not only shows that Israel experienced various business cycles during its history, but also that these economic fluctuations were quite moderate, especially when compared to those in other countries. Part of the chapter will analyze why most business cycles in Israel were relatively short and relatively moderate. Another question this chapter discusses is what drives the various business cycles in Israel: demand shocks, supply shocks, or financial shocks?

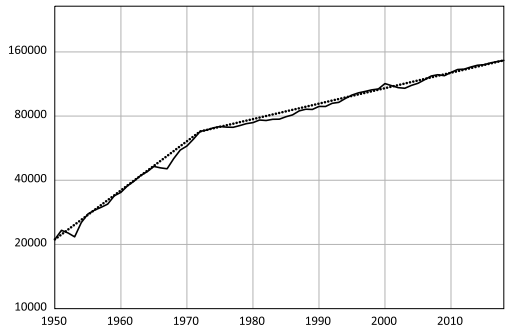

FIGURE 7.1. GDP per capita in Israel in 2015 prices, with two trend lines, 1950–2018.
Data are from Central Bureau of Statistics (2019, tables 2.1, 11.1, and 11.2).

Business cycle theories try to explain what causes business cycles. This is an important theoretical question, since during recessions, when unemployment is high, there is vast economic inefficiency: Many people would like to work and produce, but they cannot. This question is practically important as well. Understanding business cycles can help reduce the suffering from unemployment and from loss of income. Bear in mind that the worst recession in modern history, the Great Depression, began in the United States in 1929, spread to most industrialized countries, and led to more than 15 percent unemployment rates and to declines in income of more than one-third for longer than a decade. Many even view the Great Depression as a major cause of the rise of Fascism and Nazism and of World War II. During this crisis, John Maynard Keynes (1936) published his important book, *The General Theory of Interest, Employment, and Money*, which has had a profound impact on economic thinking ever since.

According to Keynes, business cycles are driven by shocks to aggregate demand for goods and services, mainly shocks to investment. If aggregate demand falls, firms reduce production to avoid accumulation of inventories. That leads to layoffs and to unemployment. Some economists criticized Keynes for ignoring the role of prices and wages in equilibrating the economy. If demand for goods declines, prices should fall both due to excess supply of goods and due to falling wages, because of unemployment. Lower prices should increase aggregate demand and end the recession quickly. Disciples of Keynes argued in response that prices and wages do not fall much in recessions. They called it "price and wage downward rigidity." One of the first to make this argument was Don Patinkin (1956), the renowned Israeli economist. This argument received empirical support in the famous study by Phillips (1958), who examined how British wages reacted to unemployment over 100 years. He found that wages declined in high unemployment, but very slowly. Namely, they were downwardly rigid.

The Keynesian theory not only explained business cycles but also derived a simple and strong rule about how to mitigate the effects of recessions. Since this theory viewed business cycles as market failures, due to the sluggish reaction of prices and wages, it justified public involvement in recessions. Keynesians recommend a countercyclical public policy, which expands aggregate demand in recessions. This could be either monetary policy (which lowers interest rates to spur investment) or fiscal policy (which increases public demand for goods and services). Indeed, such policies have become common in the developed world since the end of World War II. Actually, the original policy recommendations of Keynes were more radical. He proposed social control of investment and redistribution of income between rich and poor to increase consumption, as the poor consume more of their income than the rich do.

The success of the Keynesian theory was a result of the observation that indeed, most business cycles are demand driven. Very few examples deviate from this rule. One such example was the supply-driven business cycles in the 1970s, when global energy prices rose sharply. The first shock occurred in 1973, when the Organization of Petroleum Exporting Countries (OPEC) raised oil prices following the Yom Kippur War, and the second after the fall of the Shah and the rise of Khomeini in Iran in 1979, which also raised oil prices. The two events caused a global recession, which was different from standard recessions, as both unemployment and inflation increased, and thus the event earned the name "stagflation."[1] Interestingly, the initial stages of the current Covid-19 recession had elements of decline in supply, due to lockdowns, in addition to a sharp decline in demand.

Another mechanism that operates in some business cycles is failures in financial markets, which can trigger a recession or can make it longer. The Great Depression began with the

collapse of the US stock exchange in 1929 and intensified with the collapse of banks in 1933. Hence, it was to some extent a financial business cycle, and Ben Bernanke contributed significantly to understanding it.[2] Interestingly, the Great Recession of 2008 was also a result of a financial crisis. Fortunately, Bernanke was then the chair of the Federal Reserve. Due to his expertise, he recognized the danger, applied an aggressive countercyclical policy, and vigorously rescued US banks. Thus, he was the right man with the right knowledge in the right position.

This chapter identifies each of the business cycles in Israel, describes them, and explains them as much as possible. The chapter also characterizes each business cycle to determine whether it is demand driven, as most business cycles are, or supply or financially driven. Therefore this chapter is a story about six Israeli recessions.

First Identification by GDP Growth and Unemployment

This section presents a first attempt to identify business cycles in Israel. It uses two variables, the rate of change of GDP per capita and the rate of unemployment. Figure 7.2 shows the rate of change of GDP per capita. Although economists usually measure business cycles by changes in GDP, we use GDP per capita to neutralize the high population growth in Israel, due both to immigration and to high fertility. Figure 7.2 also presents the average rates of growth of GDP per capita before and after 1973 (5.6 and 1.7 percent, respectively) by the dotted lines.

Figure 7.2 shows that GDP per capita fluctuated frequently over the years, but many fluctuations were of short duration and did not constitute significant recessions. A careful examination of figure 7.2 points to the following periods as suspects for possible recessions: **1952–1953, 1966–1967, 1976–1977, 1982–1984, 1989, 1997–1999, 2001–2003, and 2008–2009**. Note that after 1989, GDP growth goes through some fluctuations but also has a rising trend. This is due to the arrival of the immigration from the ex–Soviet Union countries that began in 1990 and led to a significant economic boom. To examine which of the above "suspicious" periods was indeed a recession, we turn to data on unemployment in figure 7.3. The Central Bureau of Statistics estimates the number of unemployed from labor surveys, where unemployed persons are defined as those who do not work and have searched for work for a month prior to their interview. The Central Bureau of Statistics also gathers data from employment offices. Hence, data on unemployment are highly reliable.

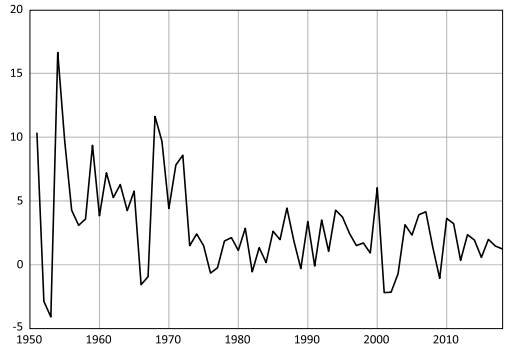

FIGURE 7.2. Rate of change of GDP per capita, 1951–2018 (percent).
Data are from Central Bureau of Statistics (2019, tables 2.1, 11.1, and 11.2).

Unemployment in 1949 was very high, close to 14 percent, due to the large number of new

immigrants, who were still searching for jobs.[3] Then it began to decline sharply. But in 1952 the decline stopped at 8 percent, and in 1953 unemployment went up to 11.5 percent. This behavior supports the above hypothesis that 1952–1953 was the first recession in Israel. The rate of unemployment declined sharply after 1953 and reached a low level of less than 4 percent in 1961. In 1966, the rate of unemployment increased again and peaked at 10.4 percent in 1967. Together with the GDP growth data in figure 7.2, we can deduce that 1966–1967 was another recession, the famous "Mitun."[4] After 1967, the rate of unemployment fell sharply and stayed below 4 percent during the 1970s. Hence, we reject the possibility of a recession in 1976–1977, which emerged from figure 7.2, as these were years of very low unemployment. A closer look at the components of aggregate demand shows that in 1976–1977, public consumption declined from the high military spending of 1973–1975, but private consumption increased, and exports increased by much more. I therefore reject the possibility of a recession in 1976–1977.

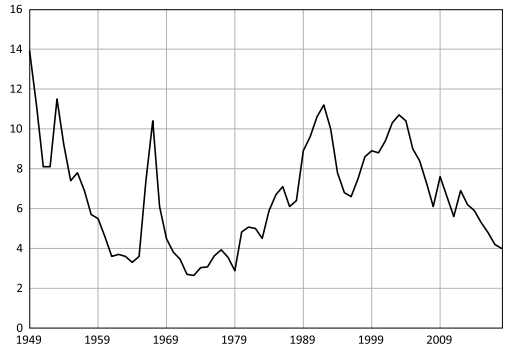

FIGURE 7.3. Unemployment rate in Israel, 1949–2018 (percent).
Data are from Central Bureau of Statistics (2019, table 9.1), and from Halevi and Klinov-Malul (1968, table 14).

In the early 1980s, the rate of unemployment increased gradually and stabilized at around 6 percent from 1984 to 1988. According to Yashiv (1996) and to my analysis in a later section in this chapter, this rise was structural and not a result of a new business cycle. The equilibrium rate of unemployment, called by Milton Friedman the "natural rate of unemployment," increased during the early 1980s. We can therefore reject the possibility of a recession in the years 1982–1984, as the data on GDP growth suggest. Furthermore, although public consumption declined in 1982–1983, mainly due to reduction in defense, private consumption increased by more than 8 percent in each of these years, and investment increased by more than 15 percent in 1982 and more than 11 percent in 1983. Note also that these were years of high inflation, and measurements of real variables, including GDP, might have been less accurate. Data on unemployment, though, was much more reliable.

In 1989, the rate of unemployment increased to 9 percent and continued to rise in the following years until it reached 11.2 percent in 1992. Clearly, the high unemployment from 1990 on is due to the immigration from the ex-Soviet countries. However, the rise in unemployment already in 1989 indicates that in 1989, the economy entered a recession, which the immigration wave that began in 1990 ended early. Hence, 1989 was the third recession in Israel—a very short recession.

In 1992, the rate of unemployment reached a peak, as the new immigrants began to enter the labor market rapidly. By 1996, the rate of unemployment was already close to that in the mid-1980s, around 6 percent. Then unemployment climbed again and reached a high level of 9

percent in 1999. That fits with the behavior in figure 7.2 as well, so we can conclude that in 1997–1999, Israel experienced its fourth recession. In 2000, unemployment declined slightly for 1 year, but in 2001, it increased again and reached a peak of 10.4 percent in 2003. Together with the data in figure 7.2, it shows that 2001–2003 was the fifth recession in Israel. Both figure 7.2 and figure 7.3 point at 2009 as a recession year, which is not surprising, as this coincides with the global Great Recession, although it was relatively mild and short in Israel. This is the sixth Israeli recession.

This chapter therefore identifies six recessions, or six business cycles, in the history of Israel.[5] Similar to the methods of the NBER, the identification builds on data on output and on employment. Comparing this conclusion with other studies on business cycles in Israel, which are quite few, I turn to the most prominent researcher in the area, Rafi Melnick. He publishes a monthly index of the state of the economy, called the "Melnick Index." Initially the index was a weighted average of four indexes: manufacturing production, retail trade, imports, and vacancies. During the 1990s, Melnick replaced vacancies by "employees in the business sector" and replaced retail trade by "revenues from commerce and services."

Using this index, Melnick (2002) dates Israeli business cycles. He identifies the same recessions as I do but adds two more: one in 1979, during the tenure of Finance Minister Yigal Horowitz, who tried to run a contractionary fiscal policy; and another in 1983–1985, following the banking crisis. I claim that these were not recessions. In 1979, public consumption indeed declined by 9.5 billion NIS (in 2015 prices), but private consumption increased by 8.5 billion NIS, investment by 6.4 billion NIS, and exports increased by 1.5 billion NIS. Hence, aggregate demand increased significantly in 1979. The years 1983 and 1984 experienced very high inflation, and their rates of growth were close to the average. As mentioned above, the rate of unemployment rose in those years due to structural changes and not cyclically. Hence, 1983–1985 also do not look like a recession.

Djivre and Yachin (2011) also identify business cycles during 1987–2010. They find the same recessions as I do in this chapter, but add one recession in 1992–1993, during the absorption of immigration from the former Soviet Union. I disagree with this identification. In both years, private consumption increased by more than 7 percent, investment by more than 6 percent, and exports by more than 10 percent. Hence, these years do not look recessionary.

A Closer Look at Each Recession

Following the identification of the six business cycles, this section tells the story of each recession and presents some data on it. The data are rates of change of GDP, investment, private consumption, public consumption, and of exports, and the unemployment rate. The data also help clarify how each recession began and how it ended.

THE RECESSION OF 1952–1953

As described in chapter 1, the huge wave of immigration to Israel between 1948 and 1950 doubled the population of the country. The young state faced the daunting task of building homes and jobs for the immigrants as soon as possible. In addition, it faced an urgent need to settle the periphery in order to stabilize the new borders. This was particularly urgent, since many of the Palestinians who had fled during the war tried repeatedly to return to their villages. Facing such challenges, the economy suffered from severe lack of funding, since unlike the immigrants who

came before World War II, the new immigrants were penniless. The European Holocaust survivors ("She'erit Hapleita") lost everything during the war and had subsequently stayed in displaced persons camps. The immigrants from the Arab countries had to leave all their wealth behind and were poor as well.

For a while, the Israeli government tried to solve this problem by imposing a strict austerity, called "Tzena," which forced savings, and by printing money.[6] However, in 1952 these policies reached a dead end. The Austerity Plan eroded due to expansion of the black market, and printing money began an inflationary episode. As a result, the government, under the leadership of Minister of Finance Eliezer Kaplan, adopted a new economic policy, which consisted of serious cuts in public investment, and even a reduction in the flow of immigration. This new policy triggered a recession. Table 7.1 presents the various rates of change during this episode, together with the rate of unemployment over the cycle.

TABLE 7.1. Data on the business cycle, 1951–1955 (percent)

Year	1951	1952	1953	1954	1955
GDP	30.1	4.4	−1.4	19.4	13.6
Investment	18.2	−14.0	−16.3	11.6	23.1
Public consumption	21.3	−1.5	5.0	16.6	16.2
Private consumption	22.4	7.4	3.4	14.9	7.6
Exports	39.2	30.9	22.9	42.4	2.8
Unemployment	8.1	8.1	11.5	9.2	7.4

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.1), and Halevi and Klinov-Malul (1968, table 14).

Table 7.1 illustrates the dramatic drop in investment in 1952–1953, due to lack of finance and contractionary fiscal policies. Interestingly, exports continued to grow rapidly during those years. Hence, this recession was not imported but was driven by domestic events.

In September 1952, Israel signed the Reparations Agreement with West Germany. In the agreement, Israel received large payments to enable it to absorb refugees of the Holocaust. In addition, individual survivors could apply to West Germany for individual reparations as well. The payments began in March 1953 and lasted until 1965. The government of Israel received 3 billion German Marks, either in money or in investment goods. This agreement solved the problem of funding and led to a leap in investment in 1954 and 1955, as table 7.1 shows. Public consumption increased as well, and the short recession ended.

Table 7.1 demonstrates that the cause of this recession was a sharp decline in aggregate demand, mainly demand for investment, driven by a contractionary fiscal policy. The recession ended with the payment of West German reparations, which enabled Israel to renew its high investment. This was therefore a clear case of a Keynesian demand-driven business cycle.

THE RECESSION OF 1966–1967

The second recession occurred in 1966 and 1967; it was a result of contractionary fiscal policy as well. There were several reasons for this policy. One was the completion of some large public projects, like the National Water Carrier, the Ashdod Port, and the construction of housing projects for people from Ma'abarot. A second reason was the end of the West German reparations to the government in 1965. The Israeli government was concerned that this decline in

revenues might cause deficits if they did not reduce expenditures. However, the main reason for the contraction was to reduce the trade deficit.

Documents published recently, in Israel State Archives (2016), reveal that by the end of 1964, the Ministerial Committee for Economic Affairs had already begun to plan a fiscal contraction. On October 18, 1964, the committee recommended "to take actions to stop the growth in demand and to restrain the rise in production costs." In a secret protocol of one of the first meetings of the Ministerial Committee in October 1964, the Governor of the Bank of Israel, David Horowitz, related these measures directly to the balance of payments. He reported that a special delegation from the International Monetary Fund (IMF) had visited Israel and had strongly recommended curbing demand in order to reduce Israel's trade deficit. Hence, international pressure also contributed to the decision to adopt a contractionary policy.

Despite its early planning, the government announced the new policy only in 1966. The Minister of Finance Pinhas Sapir presented the new budget in February 1966 and said: "The recession ('Mitun') policy of the government focuses especially on investments, which the government can significantly influence—in shipping, mining, construction and irrigation."[7] Table 7.2 presents data on this cycle, using the same variables as in table 7.1.

Table 7.2 shows that output growth slowed significantly in 1966–1967, and unemployment rose sharply from around 3.5 percent to more than 10 percent. According to table 7.2, the sharpest decline was in investment, which had already stopped growing in 1965, but in 1966–1967, it experienced a cumulative decline of 35 percent. Private consumption slowed down as well, partly due to the slowdown in output and partly due to the limits on credit imposed by the Bank of Israel, to reduce imports of such durable goods as cars and electrical appliances.

TABLE 7.2. Data on the business cycle, 1964–1969 (percent)

Year	1964	1965	1966	1967	1968	1969
GDP	8.5	9.4	1.0	2.3	15.4	12.7
Investment	21.2	0.6	−16.2	−22.5	48.9	26.5
Public consumption	1.3	11.4	9.5	33.5	8.7	15.8
Private consumption	8.2	8.7	2.1	2.1	13.6	10.0
Exports	3.8	8.4	10.5	8.3	27.7	6.9
Unemployment	3.3	3.6	7.4	10.4	6.1	4.5

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.1).

Table 7.2 shows that the recession was quite deep. It actually surprised the government in its severity. The recession created rage in the periphery and in poor neighborhoods in the big cities. The government feared civil unrest and even began to consider instituting unemployment benefits. Such benefits did not exist before, because of the Zionist ethos of labor and the fear that such payments might encourage unemployment. The recession depressed moods in the young country and even generated a wave of black jokes. The most famous was a sign posted at the Lod Airport (today the Ben-Gurion Airport) that read: "The last to leave turns off the light."

The 1966–1967 recession fits well the Keynesian theory of fluctuations in aggregate demand. It began with a sharp decline in investment, mainly by the government, which controlled most finance in the country. The way out of the recession was also due to an aggregate demand shock. In May 1967, at the height of the recession, Egypt sent troops into the Sinai Peninsula, and after a few weeks of tense waiting, the Six-Day War broke out on June 5. The war greatly increased

defense expenditure, as shown in chapter 5, and its effect can also be seen in table 7.2 by the sharp rise of public consumption in 1967. In 1968, output already began to grow fast, and unemployment declined sharply.

THE RECESSION OF 1989

In December 1987, the First Intifada broke out, and the Israeli-Palestinian conflict returned to the front stage. The Intifada was long and lasted 5 years, until the signing of the Oslo Agreement in September 1993. At the beginning, the Intifada was limited to the Palestinian territories, and consisted mainly of demonstrations, stone throwing, and general strikes. However, it gradually became more violent on both sides and crossed the "Green Line" into Israeli civil areas. Soon enough, the Intifada deterred tourism and affected consumption by Israelis as well, who went less frequently to shopping areas. The Intifada also affected investments negatively, as it increased business pessimism. Table 7.3 presents the relevant data for the period 1986–1991.

TABLE 7.3. Data on the business cycle, 1986–1991 (percent)

Year	1986	1987	1988	1989	1990	1991
GDP	3.6	6.1	3.6	1.4	6.6	6.1
Investment	7.3	6.0	1.8	−2.0	25.9	42.8
Public consumption	−9.7	18.2	−2.5	−9.2	7.6	4.6
Private consumption	15.1	8.9	4.7	0.5	6.0	7.2
Exports	5.6	10.2	−1.5	4.1	2.0	−2.8
Unemployment	7.1	6.1	6.4	8.9	9.6	10.1

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.1).

Table 7.3 shows that investment growth had already declined in 1988, the first year of the intifada, and in 1989 investment growth was even negative at −2 percent. This was due to the higher risks from the intifada, political, economic, and personal. Tourism declined as well in 1988, as shown by the data on exports. Fiscal policy was contractionary throughout the period, mainly due to decreasing defense costs after the peace with Egypt. Note that the unusual upward jump in public consumption in 1987 is due to the purchase of a large number of F-16 jets that year, which increased defense consumption but did not contribute at all to domestic demand.

Hence, this recession was also demand driven, as were the first two recessions. The declining demands were in investment, tourism, and private consumption. The recession ended with a sharp rise in aggregate demand. In 1990, immigration from the former Soviet Union began. It increased the demand for investment dramatically, as table 7.3 shows, as well as the demand for private consumption. This was partly due to the purchase of durable goods by immigrants, who built new households on arrival and bought household goods. The rising demand pulled the economy out of recession and created a strong boom. Although the unemployment rate continued to rise in the early 1990s, it was no longer cyclical unemployment, but rather unemployment due to increased labor supply by the immigrants.

TABLE 7.4. Data on the business cycle, 1995–2000 (percent)

Year	1995	1996	1997	1998	1999	2000
GDP	6.5	5.1	4.1	4.2	3.5	8.9

Investment	8.4	8.6	0.6	−2.7	6.3	1.8
Public consumption	−1.0	1.3	2.5	2.7	2.3	2.1
Private consumption	7.8	6.0	4.0	5.8	4.1	8.4
Exports	10.0	6.1	9.1	6.2	14.5	23.4
Unemployment	6.8	6.6	7.5	8.6	8.9	8.8

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.2).

THE RECESSION OF 1997–1999

The boom created by the immigration ended in 1997, and a new recession began. It was not a deep recession, but it was relatively long, and lasted 3 years, until 1999. Table 7.4 presents the data for this business cycle. The most striking sign of the recession is the increase in the rate of unemployment from 6.6 percent in 1996 to 8.9 percent in 1999. The growth of GDP also slowed, and its average rate in 1997–99 was 3.9 percent, much less than in the early 1990s. According to table 7.4, the main driver of the recession was investment. Until 1996, it increased at a high rate, due to immigration and to the business optimism after the Oslo Accords. However, in 1997 investment increased by less than 1 percent, and in 1998 it even dropped by almost 3 percent.

There were several causes of the recession of 1997–1999. The first was the end of the large investments in absorption of the ex-Soviet immigration. The second reason was the state of the Israeli-Palestinian conflict, as the Oslo Accords suffered a series of setbacks. The agreements—in 1993 the framework, in 1994 the Gaza-Jericho Agreement, and in 1995 the extension to the West Bank—increased optimism among investors. Part of this optimism stemmed from the collapse of the Arab Boycott on Israel. This optimism fueled increases in investment, which grew in 1994–1996 at a cumulative rate of 27 percent. Then came a number of blows to this optimism. The first was the murder of Yitzhak Rabin in November 1995. The government of Shimon Peres, who replaced Rabin, tried to overcome its weakness by an aggressive policy toward Hamas, which led to a wave of terror in 1996. This was the second blow. The third blow came when Benjamin Netanyahu won the elections in 1996. His well-known hostility toward the Oslo Accords raised concerns for the future of the process, reduced optimism, and hurt investment.

The recession, which began with a sudden decline in aggregate demand, ended in 2000 because of increased demand, as table 7.4 shows. In 2000 GDP increased by almost 9 percent, private consumption grew at a similar rate, and exports jumped dramatically by 23.4 percent. Export grew due to high tech and due to the millennium events in the Holy Land. It is also possible that the election of Ehud Barak in 1999 as prime minister raised hopes for a renewed peace process, which might have increased investment. However, the boom in 2000 was very short. In October 2000, the Second Intifada broke out and with it a new recession. This raises a question whether these were really two separate recessions or one prolonged recession. The strong boom in 2000 rules in favor of two separate recessions.

THE RECESSION OF 2001–2003

In April 2000, the prices on New York Stock Exchange collapsed, and the dot-coms were especially hard hit. This ignited a global recession, which turned out to be relatively mild. However, since Israel had begun to specialize in high-tech exports, it suffered from this recession more than other countries did. Nevertheless, the main blow to the Israeli economy came from the Israeli-Palestinian conflict. After the collapse of the Camp David peace talks in July 2000,

tensions between Israelis and Palestinians increased and in October 2000, the Second Intifada erupted. It lasted almost 5 years. It was bloodier than the First Intifada, and terrorist attacks hit the largest Israeli towns. The country entered a long and severe recession, as shown in table 7.5.

Between 2001 and 2003, GDP stopped growing, and in a country with a high rate of population growth, this meant a sharp drop in income. The rate of unemployment rose from less than 9 percent to almost 11 percent in 2003. The two main variables that caused the recession were investment and exports, as both dropped sharply after 2000. Exports declined partly due to the global recession and partly due to the sharp fall in tourism. Private consumption also slowed down during the intifada, which further deepened the recession.[8]

TABLE 7.5. Data on the business cycle, 2000–2006 (percent)

Year	2000	2001	2002	2003	2004	2005	2006
GDP	8.9	0.1	−0.2	1.1	5.0	4.1	5.8
Investment	1.8	−2.5	−9.2	−5.6	3.0	6.5	7.3
Public consumption	2.1	3.5	5.2	−2.8	−1.6	2.1	3.6
Private consumption	8.4	3.9	1.5	0.1	5.3	3.4	5.0
Exports	23.4	−11.7	−2.1	8.1	17.5	4.7	5.0
Unemployment	8.8	9.3	10.3	10.7	10.4	9	8.4

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.2).

The economy began to pull out of the recession in 2004, as table 7.5 shows. Two factors contributed to it. The first was the end of the global recession in 2003. The second was the military suppression of the intifada. Formally, the Second Intifada ended only in 2005, with the evacuation of Israelis from the Gaza Strip, but the main brunt of the intifada had already declined in 2004. Both the beginning of the recession and its end show that it was a classic demand-driven recession. It lasted more than 3 years, the rate of unemployment reached almost 11 percent, and average income fell by almost 4 percent. It was therefore the worst recession Israel has ever experienced so far.

THE RECESSION OF 2009

In August 2007, the global financial crisis erupted, culminating in the fall of the Lehman Brothers Investment Bank on September 18, 2008. The financial crisis ignited a severe global recession. It was a financial recession, which reminded many of the Great Depression of the 1930s. To indicate both the similarity and the difference, economists call it the “Great Recession.”

The recession ended after a few years in the United States, due to an aggressive expansionary monetary policy and a thorough cleanup of banks from the toxic assets that caused the crisis. In Europe, however, the recession hit harder, and the recovery began late and was quite slow, for several reasons. First, it is hard to implement a coordinated countercyclical policy in Europe, due to the structure of the European Union. Second, the European Central Bank does not yet have strong supervisory powers over European banks. Third, the rescue of European banks by their governments significantly increased public debt in these countries, which led to fiscal austerity policies that only exacerbated the recession.

The global recession hit Israel as well, as table 7.6 shows. It affected Israel mainly in 2009,

when output growth slowed down and unemployment increased from 6.1 to 7.6 percent. The main trigger to the recession were exports, which fell by close to 12 percent in 2009. This means that the recession was "imported," a result of the global recession. When the United States and Europe import less, Israel exports less, which reduces domestic aggregate demand. Hence, this cycle is also a classic demand-driven business cycle.

TABLE 7.6. Data on the business cycle, 2007–2012 (percent)

Year	2007	2008	2009	2010	2011	2012
GDP	6.0	3.2	1.3	5.5	5.1	2.2
Investment	6.3	1.8	−4.2	9.7	14.8	5.9
Public consumption	2.5	2.0	2.9	2.8	2.2	3.6
Private consumption	8.0	1.8	1.1	4.8	4.0	3.0
Exports	10.4	5.7	−11.8	15.3	9.5	−2.1
Unemployment	7.3	6.1	7.6	6.6	5.6	6.9

Source: Data are from Central Bureau of Statistics (2019, tables 9.1 and 11.2).

Table 7.6 shows that the Great Recession was not "great" in Israel, but rather mild. The slowdown of investment and exports had already begun in 2008, and they further declined in 2009. However, by 2010, we already see a recovery, and the economy returns to fast growth and low unemployment. There are two main reasons that the global recession did not have such a strong effect on Israel. First, the Bank of Israel reacted immediately with a strong expansionary monetary policy. It lowered its interest rate to less than 1 percent and began purchasing dollars in the open market in large quantities. This policy of the Governor of the Bank of Israel, Stanley Fischer, helped boost aggregate demand and pull the economy out of the recession. The second reason for the mild recession was that Israeli banks did not hold toxic assets. The banks were still under the shock of their own crisis, which began in the 1970s, exploded in October 1983, and ended fully only in the 2000s, as described in chapter 9. Hence, Israeli banks were cautious and did not invest in the assets that caused the financial crisis. It is also possible that strict supervision by the Bank of Israel since the 1980s deterred banks from risky investments.

Idiosyncratic Business Cycles

The previous section enables us to identify the shocks that started each of the six recessions during the history of Israel and the shocks that ended each of the recessions. Interestingly, nearly all these shocks were domestic and due to specific events in the country at the time. The first recession began with a fiscal contraction and ended with the arrival of German reparations. The second recession began with a fiscal contraction as well and ended with the 1967 war and the intensification of the conflict. The third recession was a result of the First Intifada and ended a year later with the large immigration wave from the ex-Soviet Union.

The fourth recession followed the murder of Prime Minister Rabin and the weakening of the Oslo Process and ended with the election of Ehud Barak to be prime minister. The fifth recession began with the Second Intifada and ended with the intifada's suppression. For the first time in Israeli history, this recession also coincided with a global recession, which followed the collapse of the dot.com shares in 2000. However, while this was a mild global recession, the Israeli recession was very deep, showing that its main cause was the domestic event of the intifada.

Only the last recession of the six, in 2009, was completely imported, and Israel was part of the Great Recession, although it experienced it mildly.

Hence, most Israeli business cycles were not synchronous with the global cycles but instead reflected Israeli domestic events. This observation gets further support from examination of US recessions since 1950, which usually coincide with global recessions.[9] The first of these US recessions lasted from July 1953 until May 1954. It occurred when the Israeli economy was booming, thanks to German reparations. The second US recession began in August 1957 and ended in April 1958, which were years of high economic growth and low unemployment in Israel. This was also the case during the third US recession from April 1960 to February 1961. During the US recession of December 1969 to November 1970, the Israeli economy was still growing fast, and unemployment was very low. The next recession between November 1973 and March 1975 also did not affect Israel, as it experienced high aggregate demand due to the military expansion following the Yom Kippur War.

The US recessions of January 1980 to July 1980 and of July 1981 to November 1982 (the "Volker recession") were also during periods of no recession in Israel. The next US recession from July 1990 to March 1991 occurred when Israel was absorbing a large wave of immigration from the ex-Soviet Union, which triggered a strong economic expansion. Hence, all US recessions until 2000 were orthogonal to Israeli business cycles. The US recession from March 2001 until November 2001 coincided with an Israeli recession, but the Israeli recession was much longer and deeper due to a domestic cause. Only the Great Recession, which hit the United States from December 2007 until June 2009, hit the Israeli economy as well, but only mildly.

Peace with Egypt and the Change in Business Cycles

The preceding analysis shows that Israel has experienced six business cycles, or six recessions, not considering the current Covid-19 recession. However, in the first 35 years, Israel experienced only two recessions, while in the following 35 years, it suffered from four recessions. Not only did the number of recessions increase, but they became longer as well. While the first two recessions lasted less than 2 years each, the recessions of 1997–1999 and of 2001–2004 were each more than 3 years long. Why did Israel become more prone to business cycles during the 1980s?

First, note that the previous section shows that all Israeli business cycles were demand driven. Next note that in its first decades, Israel went through a few economic processes, which boosted its aggregate demand. One was rapid economic growth, which required large investments. Another was absorption of immigration, especially the great immigration of 1948–1951, which usually increases demand for investment to create new jobs and new housing. It increases consumption as well, as immigrants expect higher incomes in the future, due to the Kuznets effect.[10] The third source of demand was the intensity of the wide conflict, which created large demands for defense, as shown in chapter 5.

All three processes increased aggregate demand and thus protected the economy from recessions, even during the 1970s, which were years of a deep global recession. However, these sources of demand slowed down over the years. Rapid growth ended in 1973. Mass immigration slowed down during the 1960s, and the country experienced only one more wave of large immigration, in the early 1990s. The wide conflict ended de facto with the Peace with Egypt in 1979–1982, which reduced defense costs relative to GDP, reducing aggregate demand. Hence,

from the early 1980s, Israel lost its three "cushions" that protected it against negative shocks to aggregate demand and the recessions these shocks could cause.

However, decline of defense costs after 1980 was not the only cyclical effect of the Peace with Egypt. The eruptions of the narrow conflict, namely, the Israeli-Palestinian conflict, happen to have strong recessionary effects. First, in contrast to conventional wars, which were short and ended with clear military victories, the Israeli-Palestinian intifadas were much longer, lasting a few years each, and did not end decisively. As a result, they increased uncertainty, which reduced investment significantly. Second, Israel conducted its conventional wars on its borders and beyond them, far from the civil center of the country, but in contrast, the Israeli-Palestinian outbreaks affect population centers severely. This reduces aggregate demand through reductions in tourism and domestic private consumption. Israelis went less often to shopping areas, due to the risk involved, and that reduced private consumption.[11]

Indeed, in three of the four recessions in recent decades, the main cause was an eruption of the narrow conflict. The First Intifada triggered the 1989 recession. The 1997–1999 recession followed the murder of Rabin and the deterioration of the Oslo Process. The Second Intifada caused the 2001–2004 recession. Actually, a recent Rand Corporation study, Costs of Conflict Study Team (2015), examined potential costs of a new outbreak of the Israeli-Palestinian conflict. It describes a potential recession and shows that its costs might be quite high.[12]

The Dynamics of Unemployment

This section examines more carefully the dynamics of unemployment in Israel. As unemployment strongly follows the business cycle, rising in recessions and falling in booms, such a study is relevant here. However, the dynamics of unemployment in Israel reflect not only business cycles but also waves of immigration, which tend to raise unemployment initially. As figure 7.3 shows, the early 1950s and early 1990s were years of high unemployment due to immigration.

This section examines what were the shocks that hit unemployment and how it returned after each shock to its long-run level, which Milton Friedman called the "natural rate of unemployment." Even in this long-run equilibrium, there is frictional and structural unemployment, due to shifts of workers between jobs or between sectors, which happen all the time in large, dynamic economies.

This analysis of the dynamics of unemployment actually measures the flexibility of the labor market. Since the labor market is so central and complex, there are many other measures for its flexibility, such as how easy it is for employers to hire or fire workers. In my view, these are rather narrow measures, while the measure I employ here treats the labor market as a whole.

Figure 7.3 shows that unemployment quickly returns to its natural rate, both after recessions and after immigration waves. Figure 7.3 also hints that during the 1980s, the natural rate of unemployment increased, from around 4 percent from the 1960s to 1980, to an average of 7.5 percent after 1980. Furthermore, in recent years unemployment went down to around 4 percent, which raises the possibility that the natural rate of unemployment might have declined recently. This section examines these questions more closely by conducting statistical tests of the rate of unemployment over time. Appendix 4 presents the detailed tests; here I describe only their general results.

The first finding is that the unemployment rate does indeed converge to a long-term rate of

unemployment. The second finding is that this long-term unemployment rate indeed increased in Israel after 1980 by more than 3 percentage points, from 4.2–4.5 percent before 1980 to 7.5 percent afterward. The dynamic statistical tests also examine the possibility of a later decline in the natural rate, either in 2014, when unemployment fell below 6 percent, or in 2004, when the government changed unemployment benefits. The tests show that such a decline is possible, but it is not significant statistically for lack of sufficient data.

The tests in appendix 4 also show that convergence of unemployment to the natural rate was quite fast. Any deviation from the natural rate decreases by a quarter each year. Thus, if the unemployment rate rises to 5 percentage points above the natural rate, the deviation from the natural rate would drop to less than 2 percent within 3 years. We can therefore interpret this fast return to the natural rate as an indication of labor market flexibility. Appendix 4 also shows that unemployment returned to the natural rate faster before 1980. A deviation of unemployment from the natural rate decreased annually by 27 percent before 1980 and by only 15 percent after 1980. Hence, the labor market was more flexible before 1980 than it was later.

This is a surprising finding, which contradicts standard views in Israel of a rigid labor market in early years, when the government was a large employer and the Histadrut was a strong labor union. However, there are several explanations for this surprising result. First, Israel experienced large aggregate demand until 1980, due to rapid economic growth, high immigration, and high defense costs. Hence, demand for labor was strong, and the labor market returned quickly to equilibrium. Second, being a country of immigration, Israel had a highly mobile labor market, as the entry of new workers increased upward mobility, and with it overall labor mobility. Finally, flexibility of the labor market depends also on wage flexibility, and there were two reasons for such flexibility. First, the Histadrut was a very responsible union, being a national union and especially because it was a large employer itself. It therefore helped restrain wage demands. Second, Israel had high inflation in the 1970s and early 1980s, which eroded real wages, as cost of living compensations were partial. It thus contributed to wage flexibility.

What increased the natural rate of unemployment after 1980? Eran Yashiv (1996), who first noted this change, claims that it is due to changes in unemployment benefits, which became more generous. These changes allowed the unemployed to search longer for a job and not accept early and less favorable offers. This increased the natural rate of unemployment. In 2003 the government reformed the welfare system and reduced many transfers, as discussed in chapter 12. Among these changes, the government reduced the generosity of unemployment benefits. This is why appendix 4 tests the possibility of decline of the natural rate in 2004, instead of a decline in 2014.

Finally, figure 7.4 presents the residuals of one of the tests described in appendix 4.[13] The goal of this figure is to learn about the shocks to the rate of unemployment over the years in order to re-examine the identification of the business cycles in Israel. Indeed, figure 7.4 strongly supports my dates for the recessions in Israel. The figure shows sudden positive shocks to the rate of unemployment in 1952–1953, 1966–1967, 1989, 1997–1998, 2001–2003, and 2009. These are the six recessions identified in this chapter. Figure 7.4 also shows a shock to unemployment in 2012. However, it is a rather small shock, and we can attribute it to the changes in measurement of the labor market in that year.

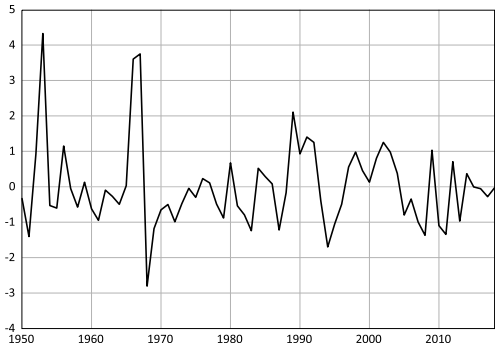

FIGURE 7.4. Residuals of the dynamic regression of the unemployment rate, 1950–2018.
The residuals are from regression (2) in table A.1 in appendix 4. This regression uses the data on unemployment used in figure 7.3.

Fiscal Policy: Counter- or Pro-Cyclical?

This chapter shows that business cycles in Israel have been demand driven. In such cases, the government can stabilize the cycle by applying either monetary or fiscal countercyclical policies. In times of recession, monetary policy lowers interest rates and thus stimulates investment and consumption. This is the immediate and most common policy, but it is often insufficient, so governments resort to fiscal policy as well. Such a policy increases public consumption, or public investment, to boost aggregate demand.

Indeed, many recent empirical studies have shown that fiscal policy is countercyclical in developed countries. However, such studies have shown that in less-developed countries, fiscal policy is pro-cyclical. The main explanation is lack of access for governments in such countries to global capital markets. In times of recession, when tax revenues decline and governments cannot borrow abroad, they need to reduce public spending. Hence, public spending is pro-cyclical in developing countries.

Interestingly, fiscal policy in Israel appears to be strongly pro-cyclical, despite it being a developed country for many years. Strawczynski and Zeira (2007) analyze this issue more thoroughly. They claim that part of the exceptional pro-cyclicality is due to how economists measure it, by the correlation over years between the rate of increase of government spending, and the rate of increase of GDP. According to Strawczynski and Zeira, this measure leads to a bias when applied to Israel due to two long-term positive correlations between the two rates, unrelated to business cycles. The first is that the years 1967–1973 witnessed a sharp increase in public consumption, due to the intensification of the conflict, while these were also years of high growth in Israel. After 1980, public consumption declined after the peace with Egypt, and growth rates were lower as well, after 1973. The second long-run positive correlation is due to immigration. Each wave of immigration accelerates economic growth, as happened in the 1990s, but it also increases public spending to absorb the immigrants.

To neutralize these long-term correlations, Zeira and Strawczynski examine the correlation between the economic growth rate and the rate of increase of public spending while controlling for the growth trend, the Israeli-Arab conflict, and immigration. Before controlling for these variables, the correlation between the two rates in Israel is very high: 1.38. However, after adding the controls, the correlation drops to 0.35. Hence, although public spending in Israel is still pro-cyclical, it is not unusual and is similar to that of Switzerland (0.34), Denmark (0.33), and even lower than that of Norway (0.68).

Why is fiscal policy in Israel pro-cyclical? A partial answer to this question is historical, as there were three recessions, out of a total of six, where fiscal policy was contractionary. In the recessions of 1952–1953 and 1966–1967, the main cause of the recessions was contractionary fiscal policy, as described in an earlier section in this chapter. In the recession of 2001–2003, fiscal policy was contractionary as well, but for a very different reason. The minister of finance at the time, Benjamin Netanyahu, used the rising deficit in the recession to justify massive permanent cuts in public spending, as described in chapter 12. This was a clear case of using the crisis of the recession as a tool to impose long-term changes.

Why Israel Had Fewer and Milder Recessions than Other Countries?

This chapter identifies six business cycles over the first 70 years of Israel's existence. This is a relatively low rate. The United States experienced eleven business cycles during that period, according to the NBER business cycles committee. The committee for European business cycles at the Centre of Economic Policy Research began its work only recently and counted five recessions since 1970. This is more than the four recessions that occurred in Israel during this period. As for the depth of the Israeli recessions, they seem to be similar to those in the United States. In both countries, recessions increased unemployment rates to between 9 and 11 percent. Unemployment in Europe during recessions has been higher, but unemployment in general is higher in Europe than in the United States. As for the length of recessions, it is hard to compare between Israel and the United States, as the NBER dates business cycles by months, while I date them in this book only annually, but the total lengths of recessions during the past 70 years are similar in the two countries.

There are several explanations for why recessions in Israel have been less frequent than in the United States and Europe. The main one is that for many years Israel had a large aggregate demand due to its rapid economic growth, immigration, and the high conflict. This large aggregate demand reduced the possibility of recessions in Israel for a long period.[14] The high aggregate demand also explains why Israel enjoyed a kind of immunization from global business cycles until quite recently. Global recessions could have reduced demand for Israeli exports, but other components of aggregate demand, like investment, military expenditures, and housing, were still strong. This is why Israeli business cycles were so independent of global cycles, as shown in previous sections in this chapter.

1. See Bruno and Sachs (1985). The cycles of the 1970s also led to a new theory of supply-driven business cycles called "real business cycles." See Kydland and Prescott (1982).

2. See Bernanke (1983). See also Reinhart and Rogoff (2009) for a history of financial crises.

3. The data include unemployment in the "maabarot," the transitory camps for immigrants.

4. Mitun is "slow-down" in Hebrew. It was the name given by the government to its contractionary policy in 1966. Later, the term caught and now it describes a recession in general.

5. As I write this book, Israel is experiencing its seventh recession, due to Covid-19. This book does not analyze this recession, since it is too early, as the recession is far from over at the time of this writing.

6. The Austerity Plan began during the war and continued for a few more years. Households received consumption goods stamps, which limited their consumption significantly.

7. See Rashumot (1966), p. 605.

8. See Eckstein and Tsiddon (2004) and Haj-Yehia (2003) for more details.

9. Data on US recessions are from NBER, https://www.nber.org/cycles/cyclesmain.html.

10. For a thorough discussion of the expansionary effect of immigration waves, see chapter 8.

11. See Haj-Yehia (2003) and Eckstein and Tsiddon (2004).

12. Interestingly, the ability of the narrow conflict to cause recessions is not new. As described in chapter 1, the Arab revolt of 1936–1939 was a countrywide clash between the Palestinians and both the British and the Jewish Yishuv. From 1935 to 1939, real net domestic product of Jews in Palestine declined by 16 percent accumulatively. As Jewish population kept increasing, output per capita of the Jewish Yishuv declined by 38 percent accumulatively. See Metzer (1998), tables A.1 and A.22. Hence, this episode further supports the mechanism described above.

13. This is the test with changes in long-run unemployment rate in 1980 and 2014.

14. Another possible explanation for having fewer recessions is the high quality of the professional public sector. These people were highly motivated to create jobs for the new immigrants and keep the economy growing.

8

The Balance of Payments

FROM DEFICIT TO SURPLUS

International Trade and the Balance of Payments

Israel is a small open economy. As such, it cannot produce all the variety of goods and services it needs, so it imports many goods and services and exports others. During the British Mandate, the Jewish community traded mainly with Britain, the Arabs of Palestine, and other countries in the Middle East. During World War II, when a large British army settled in the area, it became a large buyer of Jewish products. After 1948, trade relations with the Arab countries, including the Palestinians, stopped due to the conflict and mainly due to the Arab boycott. Instead, Israel developed trade with Western Europe and the United States.

Lack of trade with its immediate neighbors and trading instead with distant countries affected the Israeli economy in various ways. The country had to be self-sufficient in many agricultural goods, such as milk, chicken, and eggs, which are hard to import from a distance.[1] Israel also made great efforts to increase its independent production of arms and ammunition for obvious reasons. Trade with distant countries increased the costs of transportation and thus raised the cost of living. The Arab boycott caused another difficulty, as many international companies did not trade with Israel. As a result, Israel has become a hybrid trader, a small economy that must import many goods on the one hand, but that needs to produce many goods on the other hand. However, Israel soon found ways to bypass the Arab boycott. It also invested effort and funds into developing a diversified domestic agriculture and a large military industry.

International trade plays an important economic role, as it allows Israelis to consume a large variety of goods and services, while Israeli producers can specialize in a much smaller set of products. For example, in its early years, Israel specialized in citrus and in Dead Sea minerals, and today it specializes in high-tech. At the same time, Israelis consume a wide variety of products, like wheat from the United States, beef from Argentina, Italian pasta, or capers from Spain. However, international trade has an additional role, as it enables a country to use more goods than it produces, if its imports exceed its exports. This is indeed how Israel could grow fast and make large investments without hurting its consumption. The gap between exports and imports is the so-called “trade balance.” If it is negative (if imports exceed exports, as was the case in Israel for many years), there is a “trade deficit.”

A country needs foreign currency to pay for its imports.[2] How can a country do this if it has a trade deficit and the dollars it gets for its exports are less than what it needs to pay for its imports? One way is to pay from foreign reserves. Another way is to borrow abroad. Both ways yield the same economic result, as they reduce the net foreign assets in the country and hence are limited over time. A country can also pay for excess imports if it receives gifts from abroad, called "unilateral transfers." Throughout its history, Israel has enjoyed large unilateral transfers. During the British Mandate, these were mainly immigrants' money but also included donations to Zionist institutions like the Jewish Agency, the Jewish National Fund, as well as to universities (the Hebrew University, the Technion, and the Weizmann Institute), hospitals (mainly Hadassah), and other institutions. Chapter 2 shows that the funds brought by the immigrants, together with Jewish donations, covered the whole trade deficit during the Mandatory years.

In the great immigration following May 1948, things changed radically: Holocaust survivors and the immigrants from Arab countries came penniless. For a few years, unilateral transfers were very small. However, the Reparations Agreement with West Germany in 1952 significantly increased the flow of unilateral transfers. The reparations ended in 1965, but soon after, a new source of unilateral transfers emerged: financial aid from the United States. The sum of the trade balance and the unilateral transfers is called the "current account." It measures by how much net foreign assets increase in a year. Although Israel had a high trade deficit, it had a much smaller deficit in the current account, since it had large unilateral transfers. Hence, its foreign debt did not rise by so much.

The "balance of payments" records all international payments of an economy in a year and is divided into two parts: the current account and the financial account. The current account lists all payments for goods and services and all transfers. The financial account lists changes in foreign assets. In principle, the two parts must balance each other. When Israel exports a good, it receives in exchange dollars, which increase its holding of foreign assets. If Israel imports a good, it pays from its stock of dollars or it borrows. In both cases, it reduces its net holding of dollars. Hence, the two accounts should be equal. That is why we usually focus on only one account. Although the current and financial accounts should be equal, in reality they never are, as there are always errors and omissions. One prominent example of such a discrepancy occurred in Israel in the 1970s. Those were years of high inflation, and many Israelis hoarded foreign currency, especially dollars, in homes and not in banks, called "Dollar balata" ("dollars under the floor").

The Balance of Payments in Israel over the Years

Throughout most of its history, Israel had a large trade deficit, as its imports were much larger than its exports. The current account was also in deficit, despite the large unilateral transfers. This put a lot of pressure on economic policy makers, as the current account deficit meant that the economy was losing foreign currency reserves or increasing its external debt. That created three types of worries. First, high foreign debt might raise interest rates, due to a higher risk premium. Second, high foreign debt might infringe on political independence. For example, to finance its deficit in the early 1950s, Israel signed the Reparations Agreement with West Germany in 1952. That led to full diplomatic relations with Germany as early as 1965, a move that faced strong opposition, as it occurred only 20 years after the Holocaust. Third, a trade

deficit implies that domestic uses, private and public consumption plus investment, exceed domestic production, which suggests that the country was "living beyond its means." This added a moral element to the negative view on the trade deficit.

This is why the economic history of Israel is full of episodes of efforts to reduce the trade deficit, using various measures, including a sharp devaluation in 1963 and severe cuts in public investment in 1966, which even led to a severe recession, as shown in chapter 7. However, these efforts did not bear fruit, and the trade deficit remained high. Many economists and politicians even viewed it as "chronic," due to structural factors. David Klein, governor of the Bank of Israel in 2000–2005, still used this term recently and wrote (D. Klein 2014, p. 16): "there also was a chronic deficit in the balance of payments and an ongoing lack of foreign currency."

Figure 8.1 describes the trade deficit of Israel in 1952–2018 in percent of GDP. The trade deficit lists all international trade in goods and services, including "income flows," which are payments on labor and on capital services, namely interest paid on foreign debt. Although the Israeli Central Bureau of Statistics lists these income flows separately, and does not include them in the trade deficit, they should be there, as they are payments for trade in services of factors of production. While data on trade in standard goods and services are available since 1950, data on income flows are available since 1952 only. Hence, figure 8.1 begins in 1952.

Figure 8.1 shows that the trade deficit was indeed high, around 25 percent of GDP, from the early days of Israel until 1987. Since then, it has declined steeply and has recently been around zero. So Israel now balances its exports and imports. This raises the question of whether the trade deficit was indeed chronically high or changed when the conditions changed. Furthermore, even when the trade deficit was high, there were fluctuations around the average, as in 1956, the year of the Sinai War, when the deficit was higher, and also in 1973–1976, following the Yom Kippur War, and in 1990–1994, as Israel absorbed the immigrants from the ex-Soviet Union. Hence, the trade deficit reacted to various events and was not just chronically high.

To the flows of exports and imports of goods and services, depicted in figure 8.1, the current account adds unilateral transfers (namely, gifts that people and institutions in the country receive) and also other transfers (like money brought in by the immigrants). Hence, the current account sums together all the net flows of foreign currency that enter the economy and increase the stock of net foreign assets. If the current account is in deficit, it equals the decline in foreign assets that year, which also equals the rise in net foreign debt. Hence, the current account is a key economic variable for an open economy.

Indeed, unilateral transfers to Israel were very significant as Israel received large transfers first from Germany, then from the United States, and donations from Jewish and Zionist individuals and institutions. Relative to these transfers, immigrants' wealth after 1948 was small, unlike during the Mandatory period. Until 1967, the money of immigrants was zero or close to zero relative to overall unilateral transfers. After 1967, when immigration from affluent Western countries began, these sums increased but were usually less than 15 percent of total unilateral transfers. Only after 2013, when immigration from France increased, did the money of immigrants reach a level of around 25 percent of the unilateral transfers.[3]

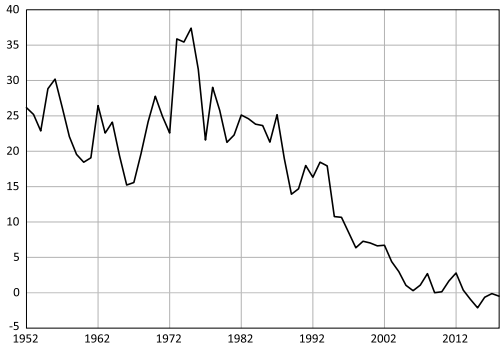

FIGURE 8.1. Trade deficit, 1952–2018 (percent of GDP).
Data on exports and imports of goods and services without income flows in dollars are from Central Bureau of Statistics (2019, table 12.1) and in NIS from the Central Bureau of Statistics, https://www.cbs.gov.il/EN/Pages/default.aspx, accessed on September 30, 2019. Data on income flows in dollars are from Central Bureau of Statistics (2019, table 12.1). Since the formal exchange rate was not realistic in the 1950s, I calculate the implied exchange rates for exports and imports from their dollar and NIS values, calculate the average, and then use it to calculate the NIS value of the income flows.

Figure 8.2 presents the deficit in the current account in Israel, namely, the trade deficit from figure 8.1 minus the unilateral transfers, in percent of GDP. As expected, the current account deficit is much lower than the trade deficit, due to high unilateral transfers. The current account was in deficit until 1998, but it was much lower than the trade deficit (between 5 and 10 percent of GDP). Only twice during this long period was the current account in surplus, as figure 8.2 shows: Once in 1954, as the West German reparations began to arrive in full steam, and in 1985, when Israel received a special transfer to support its stabilization program. When the trade deficit was exceptionally high, in 1973–1975, the current account was also high, close to 18 percent of GDP. Since 2003, the current account has been in surplus of around 3 percent of GDP.

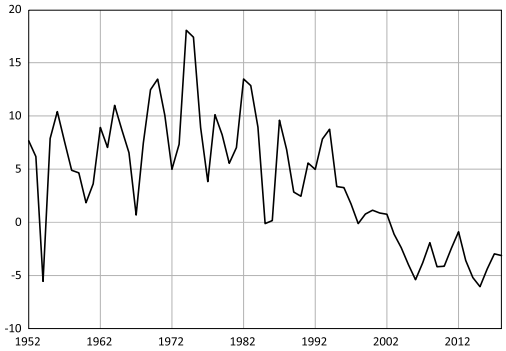

FIGURE 8.2. Current account deficit in Israel, 1952–2018 (percent of GDP).
Data are from figure 8.1 and from Central Bureau of Statistics (2019, table 12.1).

As explained above, the current account deficit determines the accumulation of the foreign debt of a country. We should therefore anticipate debt to rise fast when the current account deficit is high and to decline when the deficit is negative. Figure 8.3 describes the foreign debt as a percentage of GDP. It indeed follows this basic intuition.

Figure 8.3 shows that initially foreign debt increased significantly, due to the high current account deficit, and reached a peak of 93 percent of GDP in 1985. Afterward, the current account deficit was lower, so foreign debt as a percentage of GDP decreased, as the rate of growth of GDP was higher than the rate of growth of foreign debt. From 2003 on, the current account has

been in surplus, so Israel's foreign debt has declined, and as a share of GDP, it has declined even faster. Actually, since 2006, foreign debt has been negative, and Israel has positive net foreign assets.

This section shows that Israel experienced large fluctuations in its balance of payments. It had a very high trade deficit in its first 40 years, but the deficit declined steeply over the next 20 years and has been around zero since 2006. This raises the following questions: Why was the trade deficit so high in the past? Why did it fluctuate the way it did when it was high? And why did it decline later? The next two sections offer an explanation of these dynamics, but before that, I should rule out another common explanation. Many claim that the trade deficit disappeared because of the rise of the high-tech sector in Israel, which is mainly export driven.[4] This is a microeconomic explanation of the decline in the trade deficit.

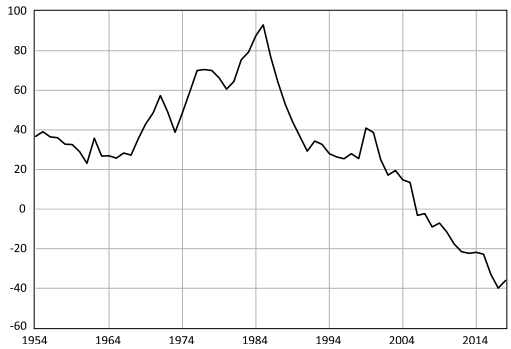

FIGURE 8.3. Net foreign debt in Israel, 1954–2018 (percent of GDP).
Data are from Central Bureau of Statistics (2019, tables 12.2 and 12.3).

Figure 8.4 presents the separate flows of exports and imports in percentage of GDP. It shows that exports have not increased significantly since the end of the 1970s but instead have fluctuated between 30 and 40 percent of GDP. However, figure 8.4 shows that imports declined from 1978 to 1998 by half. Hence, the decline of the trade deficit was not due to a rise in exports, which did not occur, but to a decline in imports. Hence, the explanation for the decline of the deficit cannot be microeconomic, but macroeconomic.

The Intertemporal Approach to the Balance of Payments

The previous section shows that the trade deficit was not constant over the years and reacted significantly to various events, such as the intensification of the conflict and waves of immigration. This should lead us to try to explain the dynamics of the balance of payments in Israel by using a relatively new theory, which has become the standard theory in the field: the intertemporal approach to the balance of payments.

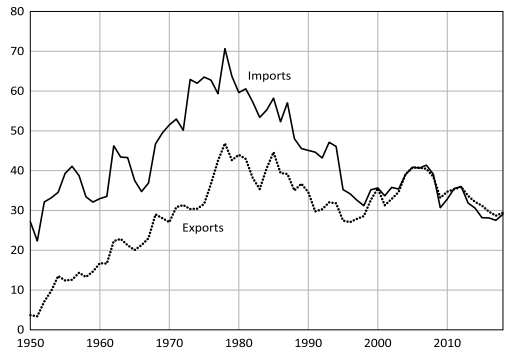

FIGURE 8.4. Imports and exports in Israel, 1950–2018 (percent of GDP).
Data are from Central Bureau of Statistics, https://www.cbs.gov.il/EN/Pages/default.aspx. Accessed on September 30, 2019.

The origin of this approach is the more general theory of consumption smoothing, both over time and across states of nature. The observation that people tend to smooth consumption over time is quite ancient. It appears already in the Biblical story on how Joseph solved the dream of Pharaoh and how Joseph saved during the 7 good years for the 7 bad years. In the twentieth century, Samuelson (1938) connected the theory of concave utility functions with consumption smoothing. Friedman (1957) further extended this result and showed that smoothed consumption should depend not only on current income but also on future expected income. He claimed that people consume an average of their lifetime expected income, which he called "permanent income."

In the early 1980s, as the use of consumption smoothing became more popular in macroeconomic theory, some economists applied the idea to the balance of payments as well. One of the first was Sachs (1981), who used a simple two-period version of the theory to study the effects of the 1970s oil shocks. Obstfeld (1981) presented a more complete model of the theory, while Blanchard (1983) added physical capital to the model, and Svensson and Razin (1983) added world trade prices. Later, Obstfeld and Rogoff (1996) published a graduate textbook based entirely on the intertemporal approach to the balance of payments, which became a classic. In what follows, I outline the main elements of this theory.

People usually smooth consumption over time through the domestic capital market. For example, a young person borrows to buy an apartment and intends to pay back the loan in the future, when her income is higher. The people who lend to this young person are usually middle-aged workers who are at the peak of their earnings, but they lend in order to save for old age, when they will retire and have much lower income. The lending and borrowing is not usually direct but is done through banks or other financial intermediaries. This is how the capital market enables people to smooth consumption over time, by interactions with other people, some of whom want to consume more than their income, and others to consume less.

However, sometimes lending and borrowing in the same country do not completely balance each other. If, for example, all domestic residents expect their future income to be higher than the present, due to rapid economic growth, borrowing to finance consumption at the expense of future income will exceed saving, creating excess demand for loans. If the economy is closed, this excess demand will raise the interest rate until the demand for loans equals the supply. However, if the economy is open, the excess demand for loans goes overseas, and residents borrow from lenders in other countries at the global interest rate. Of course, this is not direct borrowing but instead is mediated by domestic and foreign banks. However, as domestic

consumers borrow more than they lend, they can increase consumption, which then increases imports and creates a trade deficit.

Hence, the intertemporal approach to the balance of payments views a trade deficit or a surplus as a way that an open economy smooths aggregate consumption over time. If people expect aggregate future income to be higher, current consumption increases, as permanent income increases, and that creates a trade deficit. If on the contrary, people expect aggregate future income to be lower than in the present, that leads to a trade surplus. The intertemporal approach focuses mainly on smoothing consumption, but it applies to investment decisions as well. An investor who is considering a new project, compares the net return on capital to its financial cost, which, in the open economy, is the global interest rate. If the net return exceeds this cost, the entrepreneur invests in the project. If there are many such profitable projects, aggregate investment is large, which increases domestic demands and creates a trade deficit.

The intertemporal approach identifies several economic phenomena that can increase the trade deficit. The first is economic growth. If a country experiences rapid economic growth, consumers expect to have higher income in the future and thus prefer to consume more in the present, as they face higher permanent income. This increases the trade deficit. Economic growth also increases investment, and this also contributes to the trade deficit. Since Israel experienced rapid economic growth in its early years, this mechanism can be one of the main explanations for the high trade deficit during those years.

While in the past, many economists viewed expansionary fiscal policy as one of the main causes of trade deficits, the intertemporal theory of the balance of payments has a much more nuanced approach. According to the theory, the effect of an expansion in public consumption depends crucially on whether it is temporary or permanent. If it is permanent, the public understands that it will have to finance the expansion by taxes permanently, and thus its permanent income declines by the same amount. Hence, private consumption declines by the same amount, and the overall domestic demand remains unchanged. In other words, a permanent fiscal expansion crowds out private consumption fully and thus has no effect on the trade deficit.

This is not the case if the public views the fiscal expansion as temporary. Then the rise in taxes is temporary, so it reduces permanent income by much less than the rise in public consumption. As a result, private consumption falls by less, and overall domestic demand increases, leading to a trade deficit. One prominent example of a temporary increase in public consumption is war. Since Israel experienced a significant intensification of the conflict in 1967–1980, this could have been one of the reasons for the high trade deficit in these years.

The distinction between permanent and temporary is relevant for the effect of unilateral transfers as well. Clearly, any gift increases permanent income, and thus it increases consumption and with it the trade deficit. However, if people expect the gift to be constant over time, then permanent income and consumption rise by exactly the size of the gift, and so does the trade deficit. However, if people expect the gift to decrease over time, permanent income rises by less than the current transfer does, and as a result, consumption and the trade deficit rise by less. This dynamic has strong implications for the current account. If transfers are permanent, they increase the trade deficit by their full amount, which increases the current account deficit. However, the transfer itself reduces the current account deficit, so the overall effect of the transfer on the current account is zero. If the transfer is declining over time, it increases the trade deficit by less than its full amount, and hence the current account increases, or its deficit declines.

This explanation is highly relevant to Israel, since the country has received many unilateral transfers over the years. Although most transfers went to the government, we can still view them as gifts to Israeli consumers, since these transfers enabled Israelis to pay lower taxes. Furthermore, Israelis viewed most of the transfers as temporary or declining over time. The West German Reparations Agreement was for a limited period, 1953–1965. The US aid stabilized after 1986 at an annual level of $3 billion, which means that its share per capita has declined ever since. Hence, we would expect unilateral transfers to Israel to have a positive effect on the trade deficit and a negative effect on the current account deficit.

Finally, immigration waves also affect the trade deficit in three major ways, according to the intertemporal approach to the balance of payments. The first is through increasing investment. The increased supply of labor lowers wages, which raises profitability of investment. Larger investment increases the trade deficit. The second way is through the Kuznets effect. The initial wage of immigrants is very low, but they anticipate a rise in the future, once they get accustomed to their new country. As a result, their permanent income exceeds their current income and so does their consumption. This higher consumption also increases the trade deficit. The third effect of immigration is through the establishment of new households, which requires purchases of many durable goods, such as cars, refrigerators, and washing machines. Usually such purchases are uniformly distributed over the years and do not change much. However, new immigration changes this distribution, and many purchases concentrate near the arrival of immigrants. Due to these three effects, an immigration wave should increase the trade deficit.

The Trade Deficit and Its Causes: Growth, War, Immigration, and Transfers

According to the intertemporal approach to the balance of payments, the trade deficit might rise as result of economic growth, wars, waves of immigration, and unilateral transfers. Hence, Israel can be a fascinating laboratory to test these predictions. In its first 25 years, Israel grew very fast, with an average rate of growth of per capita GDP of 5 percent. This can be one reason for the high trade deficit in Israel's early years. To that, we can add the large immigration of 1948–1950, which doubled the population of Israel. This immigration, which continued in the 1950s and 1960s, could also be part of the explanation for the high trade deficit. A third factor that contributed to the trade deficit were the West German reparations, which were large unilateral transfers. In the early 1970s, when the absorption of immigrants of the 1950s ended and economic growth declined, a new factor emerged: the intensification of the Israeli-Arab conflict after 1967, and especially after 1973. The resulting increase in defense spending should have raised the trade deficit as well. In addition, those years experienced an increase in transfers, due to US aid, which also increased the trade deficit.

The peace with Egypt gradually reduced defense costs after 1980. In parallel, the US aid per capita declined as well, since the population of Israel grew quite fast. These trends tended to reduce the trade deficit. However, the large wave of immigration from the ex-Soviet Union, during the 1990s, increased the trade deficit again. Only after 2000, with lower defense costs, lower growth, fewer immigrants, and lower unilateral transfers did the trade deficit decline significantly.

This historical description points to the possibility that these events can fully explain the unique and dramatic dynamics of the balance of payments in Israel. Hence, we next conduct a more accurate test of this explanation. Prior to this book, Dahan and Hercowitz (1998) ran a

preliminary test of this hypothesis, focusing on the effects of defense and unilateral transfers on the current account in Israel. This chapter expands that analysis and examines the effect of all four relevant explanatory variables on the trade deficit and on the current account.

Appendix 5 presents the full regression analysis of the effect of all the explanatory variables on the balance of payments. The explained variables in the regressions are the trade deficit (which includes income flows) and the deficit in the current account. Figures 8.1 and 8.2 in this chapter describe the dynamics of these two variables over the years. The explanatory variables in the regressions are the following. The first is long-run economic growth, using a rate of 5 percent until 1972 and 1.8 percent since 1973. The reason for using long-run rather than annual growth rates is to avoid capturing the effects of short-term fluctuations, as the effect of cycles on the balance of payments is theoretically different from the growth effect. The variable that represents the conflict is direct annual defense costs as a percentage of GDP, shown in figure 5.1 in chapter 5. The variable that measures immigration is the ratio of new immigrants, who arrived in the past 5 years, to the overall population. The fourth variable, which measures unilateral transfers, is transfer payments as a percentage of GDP.

The results of the regressions presented in appendix 5 confirm the predictions of the intertemporal approach to the balance of payments in a very impressive way. A 1 percent increase in the long-term growth rate increased the long-run trade deficit by 2 percent of GDP. A 1 percent increase in the share of immigrants in the population increased the trade deficit by 0.4 percent of GDP. An increase in military spending of 1 percent of GDP increased the trade deficit by 0.84 percent of GDP. This coefficient is lower than 1, but is close to it, meaning that people viewed the intense conflict as temporary. Finally, an increase in transfers by 1 percent of GDP increased the long-run trade deficit by 0.6 percent of GDP. This implies that Israelis expected transfers per capita to decline over time, as indeed happened. The effect of transfers on the current account also fits the theory. An increase in transfers by 1 percent of GDP reduced the long-run deficit in the current account by a third.

These results therefore provide important support for the intertemporal approach to the balance of payments. Although this is a relatively new economic theory, it seems to fit the dynamics in Israel very well. The analysis in appendix 5 shows that the effects of growth, of wars, of immigration, and of unilateral transfers fit the theory extremely well. These conclusions reinforce my claim from the introduction to part III that economic history can be useful for examining various economic theories, especially in a country that experiences large shocks.

These results also show that the high trade deficit in the early years of Israel was not chronic. The intertemporal approach fully explains why the deficit was high in the early years and why it declined later. Appendix 5 derives a long-run equation for the trade deficit. Substituting into the model the growth rate of the early years, the high immigration rate of those years, defense costs, and the transfers after the arrival of the West German reparations, one gets a trade deficit of 22 percent of GDP, which is similar to the actual deficit of that time. If we plug in the values of the explanatory variables today, which are the growth rate of 1.8 percent and the low immigration, defense costs, and transfers of recent years, we get a trade surplus of 1 percent of GDP, which fits well the situation today. The theory therefore explains fully why the trade deficit was so high in the early years and why it declined so sharply in recent decades.

This explanation of the trade deficit by economic theory raises another question: Could the government have chosen another policy that would have lowered the deficit? I doubt it. Israel had a very deep commitment to absorbing immigrants, which was at the heart of the Zionist

project. Stopping or even slowing down immigration was therefore out of the question.[5] Moreover, absorption of immigrants required continuing economic growth, so that Israel would remain attractive to future immigrants. Foreign aid indeed increased the trade deficit, but it reduced the current account deficit, so there was no point in rejecting it. Finally, could the government have reduced defense costs? Could Israel have prevented the Six Day War or reach a peace agreement earlier? These are speculative questions, which lie beyond the scope of this book. However, high trade deficit in the first 40 years of Israel was not a failure, but a result of urgent national needs, as understood by the vast majority of Israelis.

Some Comments on Applying the Theory to Israel

The intertemporal approach to the balance of payments, which fits the dynamics of the trade deficit in Israel so well, is a theory that focuses on real events, like growth, immigration, wars, and transfers. This raises the obvious question: What was the role of exchange rates? Usually, the exchange rate affects the relative price of domestic goods to global goods and thus should affect both exports and imports. I claim that exchange rate policy had only a small effect on the balance of payments in reality. It had an effect mainly on the domestic price level, and thus chapters 9 and 10, which deal with Israeli inflation, discuss it in more detail.

Until the 1970s, the global exchange rate regime was part of the Bretton Woods system. Every country set a fixed exchange rate with the US dollar and could change it only with permission from the IMF. During its early years, Israel devalued its currency (then the Israeli pound) several times.[6] Its goal was to reduce the trade deficit, hoping that a devaluation would make imports more expensive for domestic buyers and exports cheaper for foreigners. The first devaluation took place in 1949. In 1953 came a drastic devaluation, and the value of the dollar increased from one-third to 1.8 Israeli pounds. As shown in figure 8.1, this devaluation had a negligible effect on the trade deficit. It declined from 25.2 percent of GDP in 1953 to 22.9 in 1954 and then increased to 28.8 percent of GDP in 1955.[7]

In 1962 came a famous devaluation, from 1.8 pounds to 3 pounds to a dollar. This devaluation reduced the trade deficit from 26.4 percent of GDP in 1962 to around 20 percent in 1965, but the rise of defense costs increased the deficit to 27.8 percent of GDP in 1970.[8] The effects of the next devaluations in 1967 and 1971 on the trade deficit were also small and brief, as shown in figure 8.1. From the 1970s on, the exchange rate policy served mainly as a monetary tool rather than as a tool to affect the trade deficit. During the 1990s, Israel gradually adopted a system of flexible exchange rates.

The intertemporal approach to the balance of payments builds not only on the theory of consumption smoothing but also on the ability of people to predict their future income levels. In other words, the theory relies heavily on the assumption of "rational expectations."[9] Can we apply this sophisticated assumption to the chaotic experience of a country that acts in circumstances of great uncertainty, with rapid development, amid an intense national conflict? The answer is yes, for two reasons. The first is that the above empirical tests show that people indeed could predict the relevant future events. The second reason is that most events were easy to predict. When the country experienced rapid growth for 25 years, people understood that it would raise their future income. People knew from the agreement that West German reparations would end in 1965. People were also aware of the high population growth that would diminish per capita US aid. A tougher question is whether people could predict in 1967–1977 that there

would be peace with Egypt. Probably not, but they understood that some decline in the intensity of the conflict would occur. Hence, the coefficient of military spending was 0.84.

Immigration from the Ex-Soviet Union and the Trade Deficit

The third section in this chapter claims that immigrants should increase the trade deficit by inducing new investment, by increasing their consumption, due to the Kuznets effect, and by purchasing durable goods to furnish their new households. The fourth section confirms this prediction using Israeli data over the years. Here we examine this prediction more closely by examining the most recent immigration wave to Israel, from the ex-Soviet countries. It began in 1990 with 200,000 immigrants, who increased population by 4.4 percent. A similar number arrived in 1991. Fewer immigrants arrived later, but their number was still above average, at 70,000 to 80,000 annually over the next 10 years.

Table 8.1 describes the main economic variables for Israel in the years 1988–1996, beginning 2 years before the immigration and ending with the absorption into the economy of most immigrants. Remember from chapter 7 that in 1989, on the eve of the immigration wave, the economy entered a severe recession, caused by the First Intifada. The immigration wave ended the recession immediately. In 1990, consumption grew by 6 percent and investment by 25 percent. This increased aggregate demand significantly and led to GDP growth of more than 6 percent. Investment grew even more in 1991, by more than 40 percent.

Table 8.1 enables us to understand how immigration increased demand for investment. Labor input increased significantly from 1990 on, due both to immigrants and to domestic previously unemployed workers. The increase in labor reduced the capital-labor ratio, as shown in table 8.1. That raised the marginal productivity of capital (namely, the rate of profit), as also shown in the table. As a result, investment in capital went up as shown. Note that investment jumped again in 1994–1996, after the Oslo Agreement in September 1993, which increased optimism of investors. Immigration increased not only investment, but consumption as well, due to the Kuznets effect and to purchases of durable goods, as shown in table 8.1 as well.

According to the intertemporal approach, the rise in investment and consumption during a wave of immigration should increase the trade deficit and the current account deficit. Indeed, table 8.1 shows that the trade deficit increased from 14 percent of GDP in 1989 to around 18 percent of GDP in the mid-1990s. The current account deficit increased by 5 percent of GDP during these years.

TABLE 8.1. Effect of immigration, 1988–1996

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
Immigrants (thousands)	13.0	24.1	199.5	176.1	77.1	76.8	79.8	76.4	70.9
GDP growth rate (percent)	3.6	1.4	6.6	6.1	7.2	3.8	7.0	6.5	6.1
Unemployment rate (percent)	6.4	8.9	9.6	10.6	11.2	10.0	7.8	6.8	6.6
Consumption growth rate (percent)	4.7	0.5	6.0	7.2	7.6	7.2	9.6	7.8	6.0
Capital-labor ratio (thousand NIS)	263	270	267	261	257	257	255	302	326
Rate of return on capital (percent)	3.4	3.8	5.3	7.6	8.8	8.0	6.3	14.3	12.7
Investment growth rate (percent)	1.8	−2.0	25.9	42.8	6.5	6.8	8.5	8.4	8.6
Trade deficit (percent of GDP)	19.0	13.9	14.7	18.0	16.3	18.5	17.9	10.8	10.7
Current account deficit (percent of GDP)	6.8	2.8	2.5	5.6	5.0	7.8	8.7	3.4	3.3

Source: Data on immigrants are from Central Bureau of Statistics (2015, table 4.2). Data on GDP, consumption, and investment growth are from

Central Bureau of Statistics (2019, tables 11.1, 11.2). Data on unemployment are from Bank of Israel (2019c, table 5.A.8). Data on capital-labor ratio and return on capital are from Bank of Israel (2019c, table 2.A.9). Data on trade and current account deficits are from figures 8.1 and 8.2.

It is interesting to compare the impact of this wave of immigration to Israel to another event that occurred at that time, the unification of Germany. Since East Germany had more labor than capital relative to West Germany, we can view the unification as a large immigration of people from East to West Germany. On the eve of the unification, West Germany had a current account surplus of 4.5 percent of GDP. It then fell to a current account deficit of around 1 percent in the mid-1990s. Hence, this German immigration increased the trade deficit by 5–6 percent of GDP, which is very similar to the effect of the Israeli immigration. The comparison illustrates how waves of immigration have similar impacts on the balance of payments across countries.

The Composition of International Trade

This section turns the spotlight from the macroeconomics of the balance of payments to the composition of international trade. Table 8.2 describes how much Israel exports to the different continents. However, the exports to continents do not include those countries for which trade with Israel is secret. For example, Iran does not appear in the statistical abstracts on the list of countries in Asia that trade with Israel, although it is well known that Israel had active trade with Iran before the Khomeini revolution. Table 8.2 follows the Central Bureau of Statistics and includes these countries as a separate group, called "unclassified countries."

The table shows that the main export destination of Israel in its early days was Europe, but that continent's share has declined over the years. Exports to America increased, where the main destination in America is the United States, with more than 80 percent of the Israeli exports to the continent. The table shows that the trade with the "unclassified" countries expanded considerably in 1980, when oil prices were very high. This hints that some of the unclassified countries are oil-producing countries. This becomes clear from the data on imports in table 8.3.

Table 8.2 also shows the rise of Asia as an export destination for Israel. Exports to Asia increased from a few percent in the 1950s and 1960s to more than 10 percent in the 1970s and to 25 percent recently. Around 60 percent of these exports are to China and Hong Kong. Table 8.2 also shows an increase in exports to Africa in the 1960s and 1970s. In these years, Israel made efforts to create contacts with African countries that moved from colonies to independence at the time. These relationships eroded quickly after 1967.

Table 8.3 presents imports to Israel from continents of origin over the years. The table shows that the main source of imports to Israel is Europe. In the first years of the State of Israel, the United States was its main importer, probably due to the development aid that Israel received from the United States in these years. Since then, imports from the United States have gradually declined, and today they are less than 15 percent of total imports, while imports from European countries make up about 57 percent of total imports.

Table 8.3 also shows the rise of Asia as a trading partner with Israel. In its early years, only about 2 percent of Israel's imports came from Asia, but by 2018, they had already reached 25 percent. Table 8.3 also shows that in the 1950s a considerable share of imports came from Africa, mainly from colonial countries and South Africa. These imports declined over the years. Table 8.3 also displays a sharp jump in 1980 of imports from unclassified countries. As 1980 was a year of high oil prices, the jump implies that most of the unclassified countries are oil producers, which could include Iran or other countries in the Persian Gulf.

TABLE 8.2. Exports to continents, selected years (percent of exports)

Year	1950	1960	1970	1980	1990	2000	2010	2018
Europe	72.6	69.9	54.3	52.2	41.7	33.2	32.3	35.4
America	25.4	16.4	22.5	21.2	31.7	41.2	37.0	31.7
Asia	1.1	6.1	14.0	11.0	16.3	18.5	23.6	24.7
Africa	0.3	4.8	5.3	3.4	1.4	1.7	2.5	1.4
Oceania	0.3	0.6	0.7	0.9	0.9	0.8	1.0	1.0
Unclassified countries	0.3	2.0	3.2	11.2	7.9	4.6	3.6	5.8

Source: Data for 1960–2018 are from Central Bureau of Statistics (2019, table 13.5). Data for 1950 are from Central Bureau of Statistics (2010, table 16.5).

TABLE 8.3. Imports from continents, selected years (percent of imports)

Year	1950	1960	1970	1980	1990	2000	2010	2018
Europe	36.7	54.9	59.8	46.0	62.0	53.0	44.8	56.9
America	46.1	31.1	25.5	22.0	19.8	20.5	13.4	14.4
Asia	2.9	2.1	4.9	2.5	6.8	14.6	22.5	24.5
Africa	6.3	3.5	2.1	1.7	1.8	1.0	1.0	0.4
Oceania	0.9	0.1	0.3	0.5	0.2	0.4	0.2	0.2
Unclassified countries	7.2	8.2	7.5	27.3	9.3	10.5	18.1	3.6

Source: Data for 1960–2018 are from Central Bureau of Statistics (2019, table 13.5). Data for 1950 are from Central Bureau of Statistics (2010, table 16.5).

Table 8.4 presents a different classification of imports, not by country of origin, but by their use in Israel. The uses are consumption, investment, and inputs, which are usually raw materials of various types that are used in domestic production, such as grains from the United States, beef from Argentina, and sheep from Australia. According to table 8.4, the share of inputs in total imports is stable, about 70 percent on average. By contrast, the share of investment imports is declining, while the share of consumer imports is on the rise, from 10 percent to more than 19 percent of total imports. This is not surprising, as economic growth required high investment in the early years, while later investment declined relative to output, and consumption increased.

TABLE 8.4. Imports by economic use, selected years (percent of imports)

Year	1952	1960	1970	1980	1990	2000	2010	2018
Consumption	22.7	10.1	9.8	6.8	10.3	12.4	16.4	19.2
Investment	20.8	25.0	23.7	12.1	14.3	17.3	12.8	18.5
Inputs	56.3	64.8	66.5	80.9	75.3	70.2	70.7	61.8
Inputs: Energy	12.4	6.9	4.8	26.5	10.0	9.8	17.7	12.8
Inputs: Diamonds	—	—	10.7	14.9	20.0	18.9	14.2	8.5

Source: Data for 1952 and 1960 are from Central Bureau of Statistics (1962, table 15.4). Data for 1970 are from Central Bureau of Statistics (2010, table 16.7). Data for 1980–2018 are from Central Bureau of Statistics (2019, table 13.7).

Table 8.4 also describes two specific major imported inputs: energy and diamonds. Energy has always been a vital import, since Israel did not have energy resources in the past. This changed in the twenty-first century, when Israel found gas in its territorial water, as described in chapter 4. Israel also imports raw diamonds for its diamond industry. During World War II, this industry moved from Belgium to Mandatory Palestine, which became one of the global centers

for cutting diamonds. Interestingly, both the Mandatory British government and the government of Israel allowed the diamond industry to avoid standard tax reporting. The industry submits unchecked annual reports, which are aggregate only.

Finally, table 8.5 presents the composition of exports by sector of production. In its early years, Israel was a strong exporter of citrus, but over the years, it moved gradually to industry and services, while citrus exports declined. Actually, table 8.5 shows a steady decline not only of citrus but also of agricultural exports in general, from 27 percent of total exports in 1955 to 1 percent in recent years. The decline reflects both the reduction in the share of agriculture in GDP, due mainly to lower demand for agriculture, and also a growing focus of Israeli exports on technology sectors, while agricultural production serves mainly domestic consumption.

The share of industry in exports has increased from 44 percent in 1955 to around 55 percent in recent years. In particular, two sectors have increased. One is chemicals, mainly due to the Israeli pharmaceutical sector, which constitutes 66 percent of chemicals (but in most years, it was even a higher percentage).[10] Another rising industrial sector is electronics and computers, which increased from 1 percent of exports in 1970 to more than 10 percent in 2018. In general, the high-tech industrial sectors (namely, pharmaceuticals, computers, and aircraft and airspace industries), accounted for 18 percent of total exports in 2018.[11]

TABLE 8.5. Exports by sectors in Percent of Exports, selected years (percent of exports)

Year	1955	1960	1970	1980	1990	2000	2010	2018
Agriculture	27.1	20.1	10.4	6.4	3.8	1.5	1.6	1.1
Industry	43.7	49.0	51.1	57.1	63.2	61.5	65.9	53.4
Industry: chemicals	2.3	3.3	4.9	8.3	8.6	7.4	17.1	8.1
Industry: electronics	—	—	1.0	3.3	9.6	20.5	14.5	10.8
Industry: processed diamonds	16.1	19.4	19.6	16.2	18.7	16.9	15.9	11.1
Services	29.1	30.9	38.6	36.5	33.1	37.0	30.4	45.9

Source: Data for 1955 and 1960 are from Central Bureau of Statistics (1962, table 15.9). Data for 1970 and 1980 are from Central Bureau of Statistics (1990, table 8.7). Data for 1990, 2000, and 2010 are from Central Bureau of Statistics (2012, table 16.13); for 2018 from Central Bureau of Statistics (2019, table 13.13).

The diamond industry has always been a large exporter in Israel. It declined relatively in recent years, mainly due to the rise of other exports. Interestingly, most Israeli diamond exports reach two countries, the United States (48 percent) and Hong Kong (28 percent). Hence, Israel exports three-quarters of its diamonds to these two countries.[12]

Table 8.5 also highlights the rise of the export of services, from around 30 percent of exports in the early years to around 45 percent today. Business services were 77 percent of total exports of services in 2018. The two largest such business services are computers and related services, which made up 28 percent of export services, and R&D (research and development), including exits of start-ups, which accounted for 16 percent of export services in 2018.[13]

Reality and Economic Theory Can Match

Israel had a very large trade deficit for many years, until the end of the 1980s. It was a hot issue in the public debate in Israel, since the leaders of the country, professional economists, and journalists viewed the deficit as a severe economic problem. It increased foreign debt, reduced political independence, and implied that Israel might be living beyond its means.[14] Some even

worried that the Israeli trade deficit was chronic and resulted from structural factors, which would be hard to change. In this chapter, I have cast doubt on this concern.

First, the trade deficit has dropped dramatically over the past 30 years, and it has been fluctuating around zero for 15 years. Second, this chapter explains very well the dynamics of the Israeli trade deficit, by using the intertemporal approach, which is now the standard theory for open economies. It points to several developments that fully account for the large trade deficit in the first 50 years of Israel. These developments were the fast economic growth until 1973, the large waves of immigration in the 1950s and the 1990s, the intensification of the Israeli-Arab conflict after 1967, and the large transfers from Germany, the United States, and world Jewry. Hence, the trade deficit until the late 1980s was not chronic. It was not due to lack of fiscal discipline or overspending by households. The deficit was a rational reaction of people who smooth consumption while facing very irregular economic conditions.

Our understanding of the dynamics of the balance of payments in Israel comes in retrospect. It was much harder to understand that the deficit was not chronic until it declined and disappeared. In addition, the intertemporal approach to the balance of payment is a new theory from the early 1980s. However, we can draw some lessons from this late understanding. First, as economists and social scientists, we should never declare that a phenomenon does not have an explanation, as the term “chronic” implies. It might be hard to explain it and even impossible at the time, but we should not give up on finding an explanation.

A second lesson from this understanding is how much we can learn from a country that has been hit by large shocks. Israel experienced a unique combination of a long period of economic growth, long periods of warfare, large waves of immigration, and large gifts from abroad. This unique combination of such large shocks helps identify the effects of these shocks on the balance of payments. This chapter shows that the effects fit the intertemporal approach and support this theory well. Although the chapter considers only the experience of a single country, these results carry a much wider and more general message.

1. In the early 1950s, Israelis consumed powdered milk and powdered eggs, but that could not continue for long.
2. Few countries can pay internationally with their own currency, mainly the United States.
3. These data are from Central Bureau of Statistics (2019), table 12.1.
4. See Bank of Israel (2018), p. 201.
5. In 1952, as the economic crisis intensified, Minister of Finance Eliezer Kaplan issued a new economic policy, which included a slowdown of immigration. However, it stopped after a year.
6. During the British Mandate, the Palestinian pound was equal in value to the pound sterling. After the founding of Israel, it became the Israeli pound. The Israeli shekel replaced 10 Israeli pounds in 1980. In 1985, the New Israeli shekel replaced 1,000 Israeli shekels.
7. Since the early days of the state experienced some inflation, the goal of the devaluation was also to match rising domestic prices.
8. On the failure of the 1962 devaluation to reduce the trade deficit, see also Halevi and Klinov-Malul (1968), p. 8.
9. Robert E. Lucas, Jr., introduced rational expectations to macroeconomics. It is now a basic assumption in the field.
10. See Central Bureau of Statistics (2019), table 13.13.
11. See Central Bureau of Statistics (2019), table 13.11.
12. See Central Bureau of Statistics (2019), table 13.12.
13. See Central Bureau of Statistics (2019), table 13.15.
14. Halevi and Klinov-Malul (1968, p. 11) write in their introduction: “However, some problems remained unsolved and might burden the economy in the next decade. One is the deficit in the current account.” Ben-Porath (1986c, p. 8) writes in his introduction: “Yet several problems have emerged which may continue to trouble the economy for at least the next decade. One of these is the balance of payments.”

9

High Inflation in Israel

Inflation as a Tax

Since the early 1970s until 1985, Israel experienced an episode of high inflation, which intensified over time. This episode was quite traumatic for several reasons. First, as inflation accelerated, the government seemed to lose control. Second, although Israelis developed tools to reduce the costs of inflation, like indexation of assets and wages, many could not use these tools fully. The elderly adjusted slowly, did not fully index their savings, and suffered considerable losses. Wage indexation was partial throughout the episode, which eroded the real value of wages and hurt employees.[1] The deep disagreements among economists and policy makers on how to deal with high inflation were a third reason for distress. Some, like Finance Minister Yoram Aridor and his advisors, claimed that expectations were the main driver of inflation. Others, like Liviatan and Piterman (1986), claimed that the government had lost control over monetary policy but did not explain why that happened.

However, this chapter shows that the story of Israeli inflation is quite simple in retrospect. The intensification of the Israeli-Arab conflict after 1967 increased public costs and opened a deficit, which deepened after 1973, as described in chapter 5. Since the government financed part of the deficit by printing money, it caused inflation to rise. Two serious policy mistakes made inflation jump up, once in 1979 and once in 1983. This chapter shows that this story is fully in line with the standard monetary theory of "inflation tax."

Showing how a basic theory of inflation can account for the episode of inflation in Israel is important not only for understanding the economic history of Israel but also for conveying a general message. It shows that financing a deficit by printing money can not only create inflation, but this inflation can also easily jump to higher rates. Hence, this episode can serve as a warning against financing even moderate deficits by printing money. Furthermore, we economists always like to find new empirical support for our economic theories. The Israeli episode of high inflation strongly supports the classical inflation tax model with rational expectations, and that in itself is important. As mentioned in the introduction to part III, this is another example of how economic history, especially in a country hit with large shocks like Israel, can enable us to test economic theories.

We measure inflation by the annual rate of change of the price level, which is the Consumer Price Index (CPI). The Central Bureau of Statistics has measured this index monthly since September 1951. The annual rate of inflation is the percent rate of change of CPI from December of last year to December in the current year, so it is the rate of change of prices during the year. However, when economists discuss inflation as an economic phenomenon, they mean a situation

of continuous rise of all prices in the economy over a long period. Thus, a 1-year price increase is not yet inflation. Similarly, a rise in one price (for example, of housing or oil) does not necessarily indicate inflation.

Inflation is harmful economically. To understand why, we have to analyze the relationship between inflation and money, which lies at the heart of this chapter. Money, which consists of cash and of demand deposits in banks, is a financial asset. However, it does not have a return, like interest from bonds, dividends from stocks, or rent from real estate. People hold money as a means of payment to manage purchases of goods and services. Economists call this service of money "liquidity." They measure the consumption of liquidity by the real amount of money held, called "real balances." Holding money comes at the expense of other financial assets with a return, so this lost return is the opportunity cost of liquidity.

Inflation makes holding money even more costly, as rising prices reduce its real value. If a kilogram of tomatoes costs 10 NIS today, and the annual rate of inflation is 100 percent, it will cost 20 NIS next year, so 1 NIS will be worth half of its current value. Hence, inflation is a tax on consuming liquidity, which has some negative effects. First, people hold less money in times of inflation to avoid this tax. Consuming less liquidity reduces their welfare. For example, they spend more time going more often to the bank. Second, inflation is a regressive tax that hurts poor people more than the rich. One reason is that rich people hold a smaller part of their income as money. Another reason is that inflation erodes the real value of wages and thus hurts workers. As mentioned above, although Israel had developed wage indexation, it was always partial and came with a lag.

Inflation might also be politically harmful. Modern money does not consist of precious metals as in the past. It is intrinsically worthless paper, which has value only because the government backs it as "legal tender" and issues it. In times of inflation, when the value of money declines continuously, people lose confidence in the government, which abuses its power by not keeping the value of its own currency. This might lead to loss of confidence in democracy itself. One prominent example was the hyperinflation in the early 1920s in Germany, which was probably one of the main causes for the rise of Nazism 10 years later.[2] Inflation therefore has economic, social, and even political costs, which could be quite high.

The Rise and Decline of Inflation in Israel

Figure 9.1 presents the rate of inflation in Israel over the years. Inflation seems to follow a staircase, going first up and then down. As described below, it had six steps, three on the way up and three on the way down, while during each step, the rate of inflation was quite stable. Inflation was quite low during the 1950s and 1960s, except for a short period of price increases in 1952–1953. The rate of inflation increased in the early 1970s and stabilized after 1973 at an average rate of 45 percent, until 1978. This is the first step in the staircase. A close examination of the monthly inflation rates reveals that inflation reached a higher level from November 1973, immediately after the Yom Kippur War.

In 1979, inflation jumped and stabilized at an annual rate of 120 percent. This was the second step. The monthly inflation rates point at August 1979 as the exact time of the jump. In 1983, inflation rose to a very high rate above 400 percent. This was the third step of inflation. It began precisely in October 1983. In the first 9 months of 1983, the average annual inflation rate was 130 percent, while in October–December 1983, it was 487 percent. The inflation rate in 1984

was 445 percent, and in the first 7 months of 1985, its annual rate was 381 percent.

FIGURE 9.1. Annual inflation rates in Israel, 1952–2018 (percent).
Data on the CPI are from Central Bureau of Statistics (1990, table 10.2; 2019, table 10.3).

On July 1, 1985, the government adopted a stabilization plan, and inflation dropped to a level of 20 percent per year. According to figure 9.1, inflation remained at that level until 1991. This was the fourth step of inflation. In 1992 (more accurately, in October 1991), inflation fell to an average annual rate of 10 percent. This was the fifth step. In January 1999, the inflation rate fell to a very low level, which is the sixth step of inflation, also called "price stability." The average annual rate of inflation since 1999 has been 1.5 percent.

I base the identification of the inflation steps in Israel not only on inspection of the inflation data over the years and months but also on the in-depth statistical study by Liviatan and Melnick (1998). This study has identified the steps described above. This chapter analyzes the way up the inflation process, including the stabilization in 1985, while chapter 10 analyzes the long disinflation process from 1985 to 1999.

The early 1970s were years of inflation in many countries, not only in Israel. The two main causes for that rise were the collapse of the Bretton-Woods currency arrangement as a result of the Vietnam War, and the oil shocks after 1973. There is some relation between the Israeli inflation and these events, but there are differences as well. The Israeli inflation was much higher than inflation in most Western countries, it lasted longer, and it peaked much later, in the early 1980s. This chapter shows that it had mainly domestic causes.

The Theory of Inflation Tax

This section continues to describe the relationship between inflation and money. We start with a few words about the history of money. People have used various means of payment over history. Already in ancient times, they used coins made of precious metals, such as silver or gold, with the addition of a cheaper metal to make them strong and durable. Hence, to use coins regularly, people had to trust the content of the coins. This is why many rulers began to issue coins, and many kings even imprinted their names or faces on the coins. The commitment of rulers to accept the coins for taxation payments also increased trust. Thus, issuing money became a monopoly of the government. Sometimes rulers violated the trust and reduced the content of precious metal in coins, an action called "debasement," but such events were rare.

In the modern era, paper money, which has no intrinsic value, replaced the precious metal coins. Such paper notes intensified the problem of trust, especially as the first issuers of such

notes, in the seventeenth and eighteenth centuries, were private banks. Thus, after some period of adjustment, governments became the single issuers of currency in each country, making it a "legal tender." The institute that issues money in each country is the central bank, joined by the commercial banks, which supply demand deposits, or checking accounts. The total amount of money, cash plus demand deposits, is denoted by M1. Commercial banks deposit a certain percentage of their demand deposits as reserves in the central bank. Hence, the central bank issues two types of money. One is cash, which consists of banknotes and coins, held by the public. The second is reserves of the commercial banks. The sum of the two is "high-powered money" (or the monetary base) and is denoted by M0.

Commercial banks pay some price for their participation in the monopoly of creating money. First, they have to deposit reserves at the central bank, for which they do not receive interest. Second, in Israel, opening a commercial bank requires approval by the Bank of Israel, and the Bank regulates all commercial banks. Third, in most developed countries, commercial banks must insure their demand deposits at a public insurance agency (like the Federal Deposit Insurance Corporation (FDIC) in the United States). Israel still does not have a formal deposit insurance.

As described above, inflation erodes the real value of money, and we call this loss "inflation tax." Another way to view this tax is through the need to increase the amount of money to keep liquidity stable. According to Johnson (1967, p. 123):

> in order to maintain its real balances constant in the face of inflation, the public must accumulate money balances at a rate equal to the inflation. This accumulation of money balances in order to preserve real balances is achieved at the cost of sacrificing the consumption of current real income in order to maintain real balances intact, the release of current real income constituting the equivalent of a "tax" on the holders of real balances.

Using the term "inflation tax" to describe the losses from inflation, raises the question: Who collects this tax? According to Johnson (1967, chapter 3), "the tax on real balances, in turn, accrues as revenue to the beneficiaries of the inflationary increase in the money supply." In other words, the collectors of the tax are the issuers of money: the central bank and the commercial banks. Indeed, both benefit from inflation, but in different ways. The central bank benefits by creating new high-powered money, both cash and reserves for commercial banks. Commercial banks cannot create new money out of nothing, as the central bank does. Instead, they gain as inflation erodes the real value of demand deposits, which are debts that the commercial banks owe to their depositors. Interestingly, appendix 6 shows that the sum of gains by the central bank and by commercial banks is exactly equal to the loss of money holders.

The central bank is not only gaining from inflation, but it causes it as well, by increasing the supply of money. As more money flows into the economy, aggregate demand increases, both for consumption and for investment, and if the economy is in full employment and cannot produce more, this additional demand raises prices. This effect of the amount of money on prices is one of the oldest theories in economics, called the "quantity theory of money."[3] However, why should the central bank increase the amount of money, if it knows that this action causes inflation? This usually happens if the government can force the central bank to print money to finance its budget deficit, for lack of other ways to finance this deficit. In Israel, the government has a bank account at the Bank of Israel, and it used to finance part of its deficit by withdrawing excess money from its account, namely, by increasing its "overdraft."

Although both the central bank and commercial banks issue money, only a central bank can create inflation. Increasing demand deposits by commercial banks requires increasing reserves, to maintain the required reserve ratio. The banks cannot do it, if the central bank does not increase high-powered money.[4] Hence, only the government creates inflation. If it has high expenditures and cannot collect more taxes, it might turn to tax liquidity. Milton Friedman said that inflation tax is the only tax that does not require legislation.

The theory of inflation tax explains not only how paying for the deficit by printing money leads to high inflation, but also determines what the equilibrium rate of inflation is and how it can change when hit by various shocks.[5] Thus, I use this theory below to explain the jumps in inflation in Israel in 1973, 1979, and 1983.

To understand how the inflation tax model determines the equilibrium rate of inflation, we need to focus on two main variables, real balances (which are the real value of money) and the rate of inflation. One connection between the two variables is through the demand for money. This demand depends negatively on the rate of interest, as it is the opportunity cost of holding money. Hence, the higher the rate of interest, the smaller is the demand for money. However, the nominal interest rate is equal to the real interest rate plus the rate of inflation, or the expected rate of inflation.[6] Hence, if the rate of inflation rises, the nominal interest rate rises as well and reduces demand for money. Put differently, the rate of inflation is actually the rate of the inflation tax on liquidity. If this tax rate rises, people use less liquidity (namely, they hold lower real balances). This is the classical reaction to a hike in purchase tax.

Interestingly, Israeli data reveal such a pattern exactly. To see it, we do not look at real balances per se, since demand for money also depends on economic activity, which determines the volume of transactions, and real economic activity increased significantly over the years. Hence, figure 9.2 examines instead the ratio of real balances to real GDP, or rather the ratio between money and nominal GDP over the years, to control for the effect of economic activity on the demand for money.

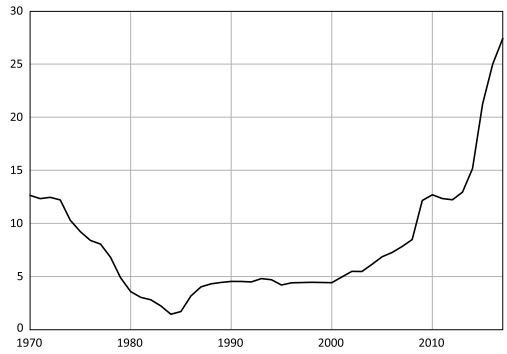

FIGURE 9.2. Money M1, 1970–2018 (percent of GDP).
Data on nominal GDP are from Central Bureau of Statistics (2019, tables 11.1, 11.2). Data on M1 are from Bank of Israel (1974, table 13.1; 1975, table 17.1; 1978, table 18.6; 1999, table 7.A.1a; 2011, table 3.A.2; and 2019c, table 3.A.11).

Figure 9.2 indeed shows that the demand for money reacted negatively to the rate of inflation, as the theory predicts. The demand for money fell strongly beginning in 1973, when inflation became high, from 12 percent of GDP to 1.4 percent of GDP in 1984. After 1985, the demand for money increased as inflation declined. Interestingly, in 2010, the demand for money was similar to that in the early 1970s, at 12.5 percent of GDP. However, after 2010 the demand for

money rose sharply. This is probably due to the low interest rates that prevailed after 2009.[7]

In addition to the relationship due to demand for money between real balances and the rate of inflation, there is a second negative relationship between these two variables. The size of the deficit dictates to the central bank how much money it should inject every year. However, the rate of inflation depends on the rate of money expansion, which is the ratio between the injection and the existing amount of money. Hence, the more money the public holds, the lower the rate of monetary expansion and hence the lower inflation will be. Using the taxation terminology, if real balances are the tax base of inflation tax, then if this base is larger, the government needs a lower tax rate to collect the same revenue, which is the deficit. Hence, this is a second negative connection between money and inflation, which is called the "deficit connection" in this chapter.[8]

The two relationships between money and the inflation have a unique equilibrium if the elasticity of the demand for money is less than 1. This means that if inflation rises by 1 percent of its previous rate, the demand for money declines by less than 1 percent. Furthermore, such an elasticity also ensures that the equilibrium is stable. Intuitively, if people expect inflation to be higher than equilibrium by 1 percent, people reduce their money holding by less than 1 percent. Hence, inflation rises by less than 1 percent, due to the deficit connection. Thus the expectation of a rise in inflation by 1 percent contradicts rational expectations. Hence, inflation will not rise, and the rational expectations equilibrium of the inflation tax model is stable.

The importance of the elasticity of the demand for money is not only theoretical: It also ensures that inflation does not diverge and become hyperinflation. Figure 9.2 shows that this condition held in Israel. The rate of inflation increased by a factor of 40, from 10 percent in the early 1970s to more than 400 percent in 1984. However, demand for money declined only by a factor of 9, from 12.5 percent of GDP to 1.4 percent. The Bank of Israel was aware of this risk and frequently checked the elasticity of the demand for money. In June 1983, it organized a conference dedicated to research on this elasticity and found that it was lower than 1 but was getting dangerously close to it.[9]

Explaining the First Step of Inflation

The first step in the inflationary episode began in November 1973, ended in July 1979, and during this time inflation was at an average rate of 45 percent. In this section, I claim that the explanation for this step was the increase in the deficit. This explanation fits inflation tax theory, as a larger deficit increases money injection every year and therefore increases the rate of money printing and so raises inflation as well. Actually, higher inflation reduces the demand for money, which further raises inflation due to the deficit connection, so it amplifies the effect of the deficit on inflation. Table 9.1 examines how much of the deficit was financed by printing money.

TABLE 9.1. Deficit, public debt, and the change in debt, 1974–1984 (percent of GDP)

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Deficit	18.8	21.0	9.9	14.5	17.1	10.3	16.9	16.1	11.9	5.9	15.3
Debt	92.1	109.4	122.8	124.2	135.8	131.4	131.7	130.2	134.0	131.8	149.5
Change in debt	13.8	20.7	15.1	3.8	16.5	1.7	4.8	4.4	5.6	1.2	20.6

Source: Data on deficits are from chapter 5. Data on public debt are from the Research Department in the Bank of Israel. Changes in debt calculated by the author.

The first row in table 9.1 shows that deficits in Israel during the inflation episode were high, on average 14.3 percent of GDP. The second row presents public debt as a percentage of GDP, and the third row describes the annual change in debt as a percentage of GDP.[10] This is actually how much the government borrowed, both from the public and abroad, to finance its deficit. The average annual increase in debt over these years was 9.8 percent of GDP. Hence, the government financed only two-thirds of its deficits by debt. It financed one-third (4.5 percent of GDP) by borrowing from the Bank of Israel, namely, by printing money. Table 9.2 further supports this conclusion by describing the components of changes in high-powered money (M0).

The first column in table 9.2 presents the overdraft withdrawals of the government from its account at the Bank of Israel. The average injection in 1974–1984 was 6.5 percent of GDP, which supports the above claim that the government financed around one-third of the deficits by printing money. I therefore conclude that the high deficit after 1973, of which the government financed one-third by printing money, was the main cause for the first jump in inflation at the end of 1973, and it explains the first step of high inflation in Israel.[11]

TABLE 9.2. Components of changes in high-powered money, 1973–1985 (percent of GDP)

Year	Injection by the public sector	Purchase of foreign currency from the public	Intervention by Bank of Israel	Total change in high-powered money
1973	2.9	0.6	−0.3	3.6
1974	5.3	−8.4	4.1	1.0
1975	6.9	−6.5	−0.2	0.3
1976	7.7	−4.3	−0.2	3.3
1977	7.3	−4.9	1.1	3.5
1978	5.9	−2.2	−1.9	1.8
1979	3.2	−5.9	3.3	0.6
1980	4.4	−4.6	2.2	2.0
1981	6.6	−2.4	−2.2	2.0
1982	5.7	−1.5	−1.9	2.3
1983	9.7	−5.7	−2.1	1.9
1984	8.8	−5.2	−0.6	3.0
1985	3.7	2.7	0.2	6.6

Source: Data are from Bank of Israel (2000, table 7.A.4B). Although these data change over the years, I picked this year, as it was the latest one to include continuous data that go back all the way to 1973.

However, the Bank of Israel made significant efforts to ensure that not all this money would reach the public, so it reduced the rate of money expansion. The Bank did so mainly by selling foreign currency to the public, as the second column in table 9.2 shows. These sales were also a result of greater demand for foreign currency, as the public tried to protect its savings from inflationary erosion. The third column in table 9.2 presents other interventions by the Bank of Israel, which also affected the amount of high-powered money. The Bank succeeded in reducing the rate of money expansion, and in 1974–1984, M0 increased by an annual average of 2 percent, much less than the injection by the government.

However, the low rate of monetary expansion does not fit the rate of inflation during the first step. High-powered money was on average 8 percent of GDP during these years. Hence, the rate of change of M0 was only 25 percent annually. However, the rate of inflation in the first step was close to 50 percent. To understand why prices increased faster than money, we apply the

"unpleasant monetarist arithmetic" of Sargent and Wallace (1981). They show that inflation might differ from the rate of money expansion if the central bank offsets money printing by the government, for example, by selling foreign currency to the public. They claim that the public understands that this policy is not sustainable, since the central bank has limited reserves. As the public anticipates higher inflation in the future, it reduces money holdings in the present, which raises inflation. This argument also explains why inflation in the first step in Israel was some average between the rate of money expansion (25 percent) and the rate of public injection, which was 80 percent of M0. Thus, the Israeli experience supplies a fascinating confirmation of Sargent and Wallace (1981).

Explaining the Second Step of Inflation

After its initial step in 1973, inflation jumped twice more, in 1979 and in 1983. The deficit, government injection, and the increase in M0 did not rise significantly in those years, as tables 9.1 and 9.2 show. So how can we account for these two jumps? This section focuses on the 1979 jump, and it follows Sussman (1992). He claims that inflation jumped in 1979 as a result of the Liberalization Program of October 29, 1977, by Minister of Finance Simcha Ehrlich. The new Likud government came to power in May 1977 and wanted to leave its impact in all areas, including economics. Ehrlich belonged to the Liberal Party, one of the main components of the Likud, and liberalization fit well his free market views. He presented the program as "revolutionary," but it focused mainly on foreign exchange. The program eliminated many restrictions on holding foreign currencies and enabled almost free trade in foreign currency.

The program failed. The demand for dollars increased significantly, and the Bank of Israel began to sell more dollars to the public, being afraid that otherwise, the exchange rate would rise and increase inflation even more. The sale of dollars threatened to deplete the foreign reserves of the Bank. As a result, the government retreated from the program after 2 years and cancelled it de facto, mainly by preventing Israelis from holding foreign currency accounts. However, this withdrawal was too late, as the horses had already bolted from the barn. Israelis purchased large amounts of dollars in the first 2 years of the program. While in 1976 and 1977 the public purchased on average $4 million each year, in 1978 it purchased $71 million, and in 1979, $69 million.[12]

Israelis did not keep these dollars in their savings accounts. They quickly converted them into cash and kept them at home. They called these piles of cash "Dollar balata," meaning dollar under the floor tile.[13] Actually, they began to use dollars as money, mainly for large transactions, like purchasing a car or an apartment. Using dollars as money reduced significantly the demand for Israeli money. In 1976–1978, the high-powered money M0 was on average 740 million NIS at 1976 prices. In 1979, M0 dropped to 412 million NIS at 1976 prices, and in 1980, it fell to 300 million NIS.[14] That is, it dropped by more than half.[15]

According to the inflation tax model, a decline in the demand for money raises the equilibrium rate of inflation. As the base of the inflation tax declines, the government has to speed the rate of money expansion in order to keep collecting the same tax revenue (that is, financing the same deficit). This pushes inflation up, due to the deficit connection. The higher inflation reduces demand for money even more, which amplifies the rise of inflation. Indeed, in 1979, inflation jumped to an annual rate of 120 percent and remained there until October 1983. Hence, the 1977 Liberalization Program can fully account for this second step of inflation.

Explaining the Third Step of Inflation

The explanation for the third jump of inflation, in October 1983, follows Sargent and Zeira (2011), also in the spirit of inflation tax theory. Sargent and Zeira claim that the cause of this jump was the bailout of Israeli bank shares, known in Hebrew as "Hesder Hamenayot Habankaiot," namely, the "Arrangement of Bank Shares." To understand it, we begin with the story of this banking scandal, the largest in the history of Israel.

During the 1970s, six banks—Hapoalim, Leumi, Discount, Hamizrachi, Igud, and General Bank—manipulated the prices of their own equity by executing trades through various subsidiaries like mutual funds and provident funds. At the time, Israeli banks controlled most other Israeli institutes of financial intermediation. Sometimes banks were helped by other banks to manipulate their own share prices. Hapoalim, Leumi, Discount, and Hamizrachi were the largest Israeli banks. Initially, the intervention only stabilized the banks' share prices, to reduce their risk and to make them more attractive to the public. Hence, they called this intervention "regulation," ("visut" in Hebrew). These interventions started early, but they were intensified in 1972 by Bank Hapoalim, and the other banks joined gradually.

Later the heads of these banks explained that high inflation had increased their nominal balance sheets significantly, so they needed to increase capital to satisfy international capital requirements. They claimed that they had to make their equity more attractive to the public, as they competed with the government's popular indexed bonds. The manipulation of their own shares was not the only crime the bankers committed. They instructed their investment advisors, who sat in each bank branch, to recommend to customers that they purchase bank shares, which they claimed would never fall, since the banks support them.

This use of illegal methods finally led to the bankers' disgrace before the Baisky Investigation Committee in 1986, which removed them from their positions. Later they faced criminal charges as well. However, the economic result of this manipulation was terrible. Initially, the banks succeeded in marketing their shares as almost risk-free assets, but then the Tel-Aviv Stock Exchange boomed in the early 1980s. The banks raised their share prices further, to compete with the other stocks. Thus, the annual real rate of return on bank shares rose from 9.7 percent between 1975 and 1979, to 40.6 percent in 1980, 32.5 percent in 1981, and 28.3 percent in 1982. This was already a Ponzi scheme.

The relevant authorities, the Bank of Israel and its Supervisor of Banks, the Ministry of Finance, and Israel Securities Authority (equivalent to the U.S. Securities and Exchange Commission) were aware of the manipulation but did little to stop it. The main explanation for this inaction was that the government needed the banks to borrow abroad. In those years of high deficits, the government borrowed heavily annually, and much of the borrowing was from abroad, for which the Israeli banks with their good international contacts were instrumental. However, this concern could not justify the grave mistake of not stopping the manipulation and the Ponzi scheme in time. The results were very costly.

In January 1983, the Tel Aviv Stock Exchange crashed. The banks kept their shares from collapsing through intensive intervention, but Israelis began to realize that the banks' shares were a bubble with prices inflated much above the true value of the shares. They began to sell bank shares and buy foreign currency. Israelis held $156 million in 1981, $193 million in 1982, and their holdings jumped to $359 million in 1983. Trying to prevent a fall in their shares' prices cost the banks more and more. The shares they held increased from $200 million in 1982 to $400

million in May 1983 and to more than $600 million in early October 1983.

On October 6, “Black Thursday,” the sales of bank shares by the public peaked, and the banks found themselves holding shares at $920 million, which was 10 percent of the total share value. The banks already needed to borrow from foreign banks to be able to buy their own shares, but on this day, they realized that they were at a dead end. They turned to the government for help, which was not surprising, as it fit the traditional involvement of the government in large economic issues. In addition, most of the large banks were public, except for Discount.[16] An important mediator between the banks and the government was Abraham Shapiro, Head of Finance Committee in the Knesset, and a well-known businessperson.

On October 6, 1983, the Tel Aviv Stock Exchange closed, and reopened 18 days later, with a bailout agreement, called the “Arrangement of Bank Shares.” The Arrangement stopped all manipulation of bank shares, and the government made a commitment to purchase the shares from the public in a future date, at their dollar value on October 6, 1983, prior to their collapse. The government agreed to pay the public in the future the inflated price of these shares, to prevent a collapse of private savings held in bank shares. This greatly increased the implied debt of the government, since the price of bank shares before the collapse was well above its true value. The government somewhat reneged on this commitment by imposing a large devaluation of the dollar of 23 percent, since the dollar price of shares was set at the post-devaluation exchange rate. Despite this devaluation, the increase in debt was significant, as shown below.

The arrangement offered stockholders two main options. The first was to keep the shares tradable, but to maintain the option of selling them to the government in October 1988 at their dollar value with a cumulative interest of 4 percent over the 5 years. The second option was to keep the shares nontradable and sell them to the government after 4 years, in 1987, with a cumulative interest of 12 percent over the 4 years. Pensioners were allowed to sell their shares to the government after 2 years. Most of the public opted to hold the shares tradable for 5 years, partly because Israelis doubted that the government would keep its commitment. Sargent and Zeira (2011) find that the rate of return on bank shares between October 1983 and the end of 1984 was 17 percent, while the rate of return on dollar bonds at that time was 8.8 percent. They conclude that the public estimated a probability of 60 percent that the government would in fact execute the bailout.

The economic effects of the bailout were far reaching. The government became the owner of the largest banks. Over the years, it sold the banks to the public, but the process is not fully over, as the full privatization of Bank Leumi has not yet been completed. Most importantly, the government accumulated a huge debt overnight, promising to pay it back within 5 years. According to the inflation tax model with rational expectations, this process should raise inflation immediately. People understood that future large payments require a large monetary expansion and thus expected inflation to rise in 5 years. Since this means a future loss for future money holders, people would reduce their money holding already in the present. The reduction of money raises the rate of inflation, according to the deficit connection. This is why Sargent and Zeira blame the future bailout of 1988 for the jump in inflation immediately in October 1983.

The increase in public debt was enormous. The dollar value of the bank shares in the settlement after the devaluation was $5.53 billion, or 22 percent of GDP. From that, we have to subtract the true value of the banks. Sargent and Zeira (2011) estimate this value from the actual proceeds of their future sales. Until July 2005, the government received $5.13 billion from the privatizations of the banks, which amounted to $1.98 billion in dollars of 1983.[17] Hence, the net

cost of the bailout was $3.55 billion in 1983 prices, which was 15 percent of GDP. Sargent and Zeira (2011) show that such a large payment by the government, even if the public estimated the probability of the bailout to be only 60 percent, could make inflation jump to more than 400 percent.

When the time for bailout arrived in 1988, the economy was in a very different position than expected in 1983. High inflation stopped in July 1985, and the stabilization program was a great success. The government purchased the bank shares without difficulties, financing it by borrowing, which became possible due to low deficits after 1985. The government purchased 1 billion NIS of shares in October 1985 from pensioners, from the general public nontradable shares amounting to 2 billion NIS in October 1987, and tradable shares equal to 5.6 billion NIS in 1988. It ended the bailout in 1991 with a total cost of 16 billion NIS at 1991 prices.[18]

However, this seemed completely impossible in October 1983. The budget deficit was high for more than a decade. The government was weak in the early 1980s, especially after Menachem Begin resigned over the continuation of the Lebanon War and Yitzhak Shamir replaced him. The economic performance of the government was especially weak. Four ministers of finance, Simcha Ehrlich, Yigal Horowitz, Yoram Aridor, and Yigal Cohen-Orgad, replaced one another in 1977–1984. The large deficit and the weak government caused public skepticism on the possibility of stabilization. Hence, assuming that the public anticipated in 1983 that the government would finance the bailout by printing money is very plausible. Thus, the bailout is indeed a very good explanation for the jump in inflation in 1983.

This section shows that the inflation tax theory can explain well the rise of inflation in Israel in three steps. There were other explanations given over the years. Liviatan and Piterman (1986) claimed that the government lost control of monetary policy, so inflation jumped every time the government made a significant devaluation of the currency, mainly due to balance-of-payments crises. This approach assigns a key role to the exchange rate, while it completely ignores the role of money. As described in this and the previous two sections, monetary expansions played a crucial role in the Israeli inflation. Actually, with a deficit monetary finance of the size of about 5 percent of GDP, it becomes less important whether the nominal anchor is the quantity of money or the exchange rate. Another alternative explanation to the jumps in inflation is given by Bruno and Fischer (1990), who use the theory of adaptive expectations.[19]

Stabilization in 1985

As this chapter shows, the ultimate cause of high inflation in Israel was the large budget deficit. Hence, stopping inflation required a significant reduction of the deficit. Such a reduction became essential also to stop the spiraling rise of public debt, which had already reached 150 percent of GDP. Such high debt hurt the ranking of Israel as a borrower, increased its country risk premium, and thus raised the interest rate it faced. This increased interest payments even further, which fed the deficit even more. Not everyone understood the necessity of fiscal consolidation at the time. One minister of finance, Yoram Aridor, even talked about curbing inflation by slowing the rate of devaluation only, without any budgetary adjustments.[20]

In the summer of 1984, the two main parties, Labor and Likud, formed a national unity government, after the elections ended in a tie. Shimon Peres of Labor served as prime minister in the first 2 years, and Yitzhak Shamir of Likud in the next 2 years. The unity government enjoyed a large majority in the Knesset, so that it could cope well with budgetary difficulties. Labor also

had good relations with the general labor union, the Histadrut, which could help in stopping inflation. However, even this government did not find its way initially. In its first year, the government tried three times to stop inflation by combinations of wage deals and price controls, but without taking serious fiscal measures. These attempts failed, and inflation continued.

Finally, the government realized that it could not avoid a more drastic program. US Secretary of State George Schultz promised Peres that the United States would support the stabilization financially and sent a team of two economists, Herbert Simon from Carnegie-Mellon University and Stanley Fischer from the Massachusetts Institute of Technology, to help guide the process. In June 1985, the two prepared an initial document to serve as a guideline for the stabilization. At the same time, Prime Minister Shimon Peres appointed a group of experts to prepare a full stabilization program. The group consisted of Emanuel Sharon, general director of the Ministry of Finance; Mordechai Frenkel from the Bank of Israel; Amnon Neubach (advisor to Peres); Michael Bruno and Nissan Liviatan of the Hebrew University; and Eitan Berglas of Tel Aviv University. The leaders of the team were Bruno and Sharon. On July 1, 1985, after a heated debate of 24 hours, the government adopted the program.

Table 9.3 presents the main economic variables before, during, and after the program. It shows that the program was indeed a great success. Inflation went down immediately. In the first half of 1985, prices rose at an average annual rate of 285 percent. In July, the government adjusted prices before freezing them, so they increased by 27.5 percent. However, in July–December 1985, inflation declined to an average annual rate of 37 percent, and in 1986–1988, the average annual rate of inflation was 18 percent. Moreover, disinflation often raises fears of high unemployment. It did not happen in this case. The rate of unemployment fluctuated in 1984–1988 around 6 percent. Only in 1989 did the rate of unemployment increase, but that was the result of the First Intifada, as explained in chapter 7. Following is an analysis of the program, divided into four main areas: fiscal policy, monetary policy, price and wage controls, and institutional changes.

TABLE 9.3. Economic data for the years around the stabilization plan of 1985, 1983–1988

Year	1983	1984	1985	1986	1987	1988
Rate of inflation (percent)	190.7	444.9	185.2	19.7	16.1	16.4
Unemployment rate (percent)	4.5	5.9	6.7	7.1	6.1	6.4
Public deficit (percent of GDP)	5.9	15.3	0.0	−2.7	0.6	3.2
Public expenditures (percent of GDP)	64.4	68.8	64.5	59.7	57.3	56.3
Defense costs (percent of GDP)	16.9	19.4	19.0	14.2	17.1	14.5
Support to business (percent of GDP)	7.9	8.5	6.2	4.2	4.2	4.1
Public income (percent of GDP)	58.5	53.6	64.5	62.5	56.8	53.1
Direct taxes (percent of GDP)	21.9	17.4	21.4	22.1	20.7	20.2
Indirect taxes (percent of GDP)	18.4	16.5	19.1	21.2	21.2	19.7
Foreign reserves at the Bank of Israel ($ million)	2,873	2,601	3,190	4,153	5,329	3,433
Interest rate on credit (percent)	181.6	771.0	443.7	61.5	61.9	46.2

Source: Data for inflation are from Central Bureau of Statistics (2019, table 10.3), for unemployment from Central Bureau of Statistics (2019, table 9.1), and for defense costs from Central Bureau of Statistics (2015, table 4). Data for public expenditures and support for business are from Bank of Israel (2019a, table 6.A.2), for public income from Bank of Israel (2019c, table 6.A.1), for direct and indirect taxes from Bank of Israel (2019a, table 6.A.4), for interest rates from Bank of Israel (2000, table 7.A.3), and for foreign reserves from Bank of Israel (1984, 1986, 1987, 1988, chapter 9 in all reports).

FISCAL POLICY

Reducing the public deficit was the key element in the stabilization program, which enabled the drastic lowering of inflation, as it prevented the need to print money to finance the deficit. The stabilization program reduced the deficit both by reducing public expenditures and by increasing public income. The major expenditure reduction in July 1985 was in subsidies to basic consumption goods, enabled by the rapid reduction in inflation. Table 9.3 shows this decline, as support to business went down from 8 percent of GDP in 1984, to around 4 percent in 1986. In general, the program aimed at a total cut in spending of $750 million, which was around 3 percent of GDP, of which half was support to business. Defense costs declined in 1986 by more than 4 percent of GDP, which reduced public expenditures significantly.[21]

Income increased in three main ways. First, the government raised the rate of value-added tax (VAT), which increased revenues from indirect taxes by 3 percent of GDP from 1983 to 1986, as table 9.3 shows. Second, tax collection increased as inflation declined. From 1983 to 1984, income from taxes fell by 6 percent of GDP, of which 4.5 percent was direct taxes. This was a result of high inflation, which enabled people, especially businesses, to pay less tax. This is a well-known effect of inflation, observed mainly in Latin America, and called the "Tanzi-Olivera effect."[22] The reduction of inflation in 1985, and especially the price controls that fixed most prices for 2 years, helped quickly restore tax collections. As table 9.3 shows, revenues from direct taxes increased after the stabilization by 4.5 percent of GDP. Third, income also increased thanks to a special grant from the United States in 1985–1986 to support the stabilization. While in 1984 Israel received $2.27 billion from the United States, US aid increased to $3.89 billion in 1985 and was $3.82 billion in 1986. Hence, in those 2 years, the additional support was more than $1.5 billion each year, or a $3 billion total increase for those years.[23]

However, the deficit reductions in 1985–1986 were not enough for the long run. The US special transfer was temporary. Tax collection increased by 3 percent of GDP, and support to business declined by 4 percent, which together were less than 8 percent of GDP, while the previous deficit had been 15 percent. Hence, continuing a low deficit became possible only through the continuing decline of defense costs during the 1980s, thanks to the peace with Egypt. The peace also helped reduce interest payments and support to business, as shown in chapter 5. Hence, the long-run success of the stabilization in reducing the deficit from 15 percent of GDP before 1985 to an average of 3 percent of GDP since then, was possible only due to the peace with Egypt. This was a truly remarkable "peace dividend."

MONETARY POLICY

The designers of the program fixed the exchange at 1,500 shekels to the dollar, and within a few months, after the introduction of the new shekel, it became 1.5 NIS to the dollar. Every stabilization of inflation needs to fix a nominal anchor, which determines other nominal prices. Traditionally this nominal anchor could be either the amount of money or the exchange rate. The Israeli stabilization program chose the second option. This has been a crucial choice for the success of the program.

As figure 9.2 shows, once inflation falls, the public increases its demand for money. In 1985–1990, the demand for money relative to GDP increased by a factor of three. If the program would have chosen the quantity of money as a nominal anchor, it would have kept it constant, in order to keep the monetary policy credible. So to increase the amount of money relative to GDP, GDP had to decline, either by a decline in real GDP or by a sharp decline in prices. Either way, it

would entail a deep recession that pushes prices and wages down. The program chose to fix the exchange rate to avoid such a recession. In a fixed exchange rate regime, the quantity of money is no longer fixed. Indeed, the public, who wanted more liquidity, sold foreign currency to the Bank of Israel, received NIS, and so increased the quantity of money, as shown in figure 9.2. Table 9.3 shows that fixing the exchange rate was an excellent choice, as the economy stabilized without large increases in unemployment.

Fixing the exchange rate was a good choice, but it is not always an easy tool to use. If the foreign currency reserves of the central bank are low, the public might doubt the ability of the central bank to support the fixed exchange rate, which might lead to a run on foreign currency and to a collapse of the exchange rate regime. The Israeli stabilization succeeded in fixing the exchange rate thanks to the US aid of $3 billion, which increased foreign reserves of the Bank of Israel significantly, from $2.6 billion in 1984 to $4.2 billion in 1986. Hence, the special aid of the United States was crucial for the success of the stabilization, both in reducing the deficit and in stabilizing the exchange rate.

Another standard tool of stabilization is a high interest rate, and table 9.3 shows that they were indeed extremely high. Real interest rates on credit were around 100 percent in 1984–1985 and around 40 percent in 1986–1987. That is obviously incompatible with a program that wished to reduce inflation without unemployment. My explanation of this contradiction is that the policy of high interest rates was not part of the stabilization program. It started earlier, in 1984, when the Bank of Israel and the Ministry of Finance allowed commercial banks to raise interest rates on credit to enable them to regain profits after the collapse of their shares in October 1983. Since the high interest rates contradicted the spirit of the stabilization program, the governor of the Bank since 1986, Michael Bruno, who was previously the architect of the program, put much pressure on the banks to lower their interest rates. Initially they stalled, until he threatened them in a public speech in 1988. Then interest rates went down.

PRICE AND WAGE CONTROLS

Imposing price and wage controls is not common in disinflation programs, which was the reason that many economists classified the program as “heterodox.” The Ministry of Commerce and Industry imposed the price controls and then removed them after 2 years. A few weeks after July 1, 1985, the labor union Histadrut joined the program and agreed to freeze wages for a year. Hence, both the price and wage controls were temporary.

It is not fully clear what was the initial goal of the price and wage controls—to cement expectations of low inflation or some other goals. In retrospect, it becomes clear that these measures helped stop inflation in the short run through two important channels. First, these measures reduced the need for large subsidies for basic consumption goods, which helped reduce the subsidies to the business sector. Second, stopping inflation in the short-run helped increase tax revenues and to reverse the Tanzi-Olivera effect.

Interestingly, the price controls raised opposition from some academic economists, mainly from Tel Aviv University, who viewed it as excessive government intervention. In retrospect, they were wrong. Price controls helped the program in the two important areas of reducing business support and of tax collection. Furthermore, these measures did not hurt markets, being temporary.

INSTITUTIONAL CHANGES

In September 1985, the Knesset enacted Amendment No. 15 to the Bank of Israel Law, known as the "Non-Printing Law." The amendment prohibits the government from borrowing from the Bank of Israel to finance its deficit. The law set strict restrictions on the government's overdraft in its account at the Bank of Israel, both daily and over the year.

The Non-Printing Law has had three important long-run effects. First, it prevented deficit financing by printing money. Second, it bolstered fiscal discipline by closing one channel of deficit financing. This law is one of the reasons the public deficit remained low after 1985, at an average of 3 percent of GDP. Third, the law increased the independence of the Bank of Israel. However, the strengthening of central bank independence did not end there. In 1986 Michael Bruno became governor of the Bank of Israel. The nomination of a prestigious academic to this position contributed to the independence of the Bank, as did later nominations of Jacob Frenkel and Stanley Fischer, both prominent international economists. This independence is important, as many studies show that the more independent the central bank is, the lower the inflation rate will be. The next chapter (10) further discusses the independence of the Bank of Israel.

Summary

This chapter tells the unique story of high inflation in Israel. This story can be of interest even to non-Israelis, as they can learn from it three important lessons. First, the story shows that we can explain the whole episode of rising inflation and its three jumps (in 1973, 1979, and 1983) by using the standard monetary theory of inflation, which is the inflation tax model. Furthermore, this story presents three types of shocks, which should affect the inflationary equilibrium. These are an increase in the deficit, an exogenous decline of demand for money, and a future anticipated increase in the deficit. The model predicts that in all three cases, inflation should jump up, and indeed this is what happened during the Israeli episode. Hence, this story lends strong support to the inflation tax model. It also serves as another example of how much we can learn from the history of a country that experiences strong shocks.

A second lesson we learn from this story is how fragile an inflationary equilibrium can be. The original cause of the Israeli inflation was the increase in the public deficit after 1967, which was a direct and indirect result of the intensification of the Israeli-Arab conflict after 1967, as shown in chapter 5. However, financing a third of this deficit by printing money raised inflation only to an annual rate of 45 percent. The next two jumps of inflation, to 120 percent and to 400 percent, were the results of grave economic policy mistakes. The first mistake was the premature 1977 liberalization, and the second was not stopping the manipulation of bank shares earlier. This shows that once the government finances a deficit by printing money, the equilibrium becomes very fragile, even if inflation is not so high. It took only two policy mistakes to stoke inflation to a very high rate, close to hyperinflation.

The third lesson is from the Israeli stabilization. Since the program was so successful, many presented it as a model for future disinflations. Indeed, the previous section shows that the program was well crafted, and that all its four parts—the fiscal part, the monetary part, the temporary wage and price controls, and the Non-Printing Law—worked together not only to reduce inflation but also to solidify this achievement and make it last. However, there are two important elements that were crucial for the success of the Israeli stabilization and are not easy to emulate in other programs. One was the large one-time special US aid of $3 billion. It was crucial both for the initial deficit reduction and for the ability to fix the exchange rate. Other

countries might find it hard to receive such a generous gift for their stabilizations. The second element is the peace with Egypt, which enabled the long-run deficit reduction. Every disinflation requires drastic changes in fiscal policy, which are usually hard to implement. In Israel, the peace with Egypt, signed and implemented prior to the stabilization, played that role. Interestingly, the planners of the program might not have fully understood it in 1985. However, the program would not have worked without the peace agreement.

1. See the second section in chapter 13 and figure 13.1.
2. This was an extreme case of hyperinflation. Inflation in Israel was high, but it never reached the level of hyperinflation, which is defined as inflation of more than 50 percent a month.
3. The theory in this chapter is a more nuanced version of the quantity theory, as figure 9.2 below shows.
4. Commercial banks can increase money by reducing the reserve ratio, but this is limited and cannot account for ongoing inflation.
5. The inflation tax theory began with Friedman (1953). Sargent and Wallace (1973) added rational expectations to the theory.
6. This is the famous Fisher equation.
7. All developed countries experienced such increases of money beginning in 2008, and this is a hot topic for research.
8. Formally, it is a negative correlation between inflation and real balances of high-powered money, but since M0 has a stable proportion to M1, this leads to a relationship between overall real balances and the rate of inflation.
9. See Offenbacher (1985) for a survey of this research.
10. Note that the third row is not the differences between the debt to GDP levels in the second row, due to growth of real output.
11. One can attribute some of the inflation in Israel to the global inflation after 1973. However, the global inflation was less than 10 percent and so can explain only a small part of the Israeli inflation.
12. Data from Bank of Israel (1999), table 6.A.13.
13. “Balata” is an Arabic word for a floor tile, adopted into Hebrew slang.
14. See Bank of Israel (1981), table 8.3.
15. See Offenbacher (1985) on research at the Bank of Israel that found a sharp decline in demand for money in 1978.
16. Bank Hapoalim belonged to the Histadrut, Bank Leumi belonged to the Jewish Agency, and Bank Hamizrachi belonged to the Religious National Party.
17. This is an overestimate of the intrinsic value of the banks in 1983, since sales of banks benefited from later economic developments in Israel, like the ex-Soviet immigration, which no one could anticipate at the time.
18. See Bank of Israel (1992). p. 256.
19. Sargent and Zeira (2011) discuss the alternative explanations in detail. Other economists, who use the inflation tax model to analyze the Israeli inflation, are Bental and Eckstein (1990, 1997) and Eckstein and Leiderman (1992).
20. Interestingly, two of his advisors were well-known academic economists.
21. The government discussed budget cuts in July 1, 1985, in dollars, as high inflation made planning in shekels impossible. Interestingly, some ministers demanded more cuts in defense, but the government refused. They did not know that defense costs were already in decline at the time.
22. Named after the two economists who observed it: Olivera (1967) and Tanzi (1977).
23. See Bank of Israel (1987), table 7.14. Half of the aid was actual, and half came from converting loans to transfers.

10

Monetary Policy and Its Costs

The Long Disinflation

In 1985, high inflation in Israel ended abruptly. From 1985 to 1992, the inflation rate was around 18 percent annually. It then declined in 1992 and remained until the late 1990s at an average rate of 10 percent per year. Only in 1999 did inflation drop down to a level of around 2 percent and has remained at a low rate until now. In 1999–2018, the average annual rate of inflation was 1.5 percent. Economists view such a low rate as price stability. Why did it take so many years to lower inflation, while ending high inflation happened so quickly? The question is even more troubling because there was no budgetary reason for this inflation. First, the deficit was low. Second, the government could not finance its deficit by printing money because of the Non-Printing Law. In other words, we cannot explain the continuation of inflation after 1985 by the inflation tax theory. Instead, we examine two other areas of economic thought: One is the theory of the Phillips Curve, and the other is independence of central banks.

The Phillips Curve is a theory about the relation between unemployment and inflation. It shows that unemployment is unavoidable when pushing inflation down. Since the government was reluctant to create unemployment, disinflation took so much time. Actually, the Bank of Israel used two exogenous episodes of unemployment, not created by the government, to put downward pressure on inflation. One was in the early 1990s, caused by the large wave of immigration from the ex-Soviet Union. The second occurred in the late 1990s, during a recession caused by the weakening of the peace process after the murder of Prime Minister Yitzhak Rabin. These two episodes of unemployment helped push inflation down from a rate of 18 percent to price stability. However, reducing inflation required, in addition to unemployment, applying high interest rates. Such a policy raised fierce criticism of the Bank of Israel. Coping with this opposition while sticking to its policy strengthened the Bank of Israel significantly. Hence, the 15 years of disinflation consist of two stories, one about the Phillips Curve and the other about the gradually growing independence of the Bank of Israel.

The Phillips Curve

The research on the Phillips Curve began with the empirical study of Phillips (1958). It examined the relationship between the rate of change of wages and the rate of unemployment in the United Kingdom over a long period, 1861–1957. The study wanted to test an important claim of Keynesian theory, that wages are downwardly rigid. Phillips used the rate of unemployment as a proxy for excess supply in the labor market, to examine how wages react to such excess supply. He plotted the rate of unemployment on the horizontal axis and the rate of change of wages on

the vertical axis and found a downward-sloping curve. Hence, larger excess supply led to greater decline of wages, as economic theory predicts. However, Phillips found that at high unemployment, the curve became almost flat. He interpreted this behavior as downward rigidity of wages, as their decline became less sensitive to excess supply in the labor market.

Early on, other economists, primarily Samuelson and Solow (1960), used the results of Phillips (1958) to draw conclusions about the relationship between inflation and unemployment. Since labor is the main input in production of goods, they concluded that the rate of change of prices is close to the rate of change of wages. Hence, similar to the curve that Phillips found, they could draw a downward-sloping curve that relates the rate of unemployment to the rate of inflation as well. Since then, this relation has been known as the "Phillips Curve." Samuelson and Solow thought that the trade-off between unemployment and inflation describes the possibilities available to policy makers, who choose a location on the curve according to political preferences.

However, this view of the Phillips Curve soon drew significant critique. Friedman (1968) and Phelps (1967) raised theoretical considerations. They claimed that workers do not actually care about their nominal dollar wage, but rather about their real wage. Hence, the rate of change of wages reflects not only pressure from the labor market, represented by the rate of unemployment, but also expectations for future inflation. Friedman and Phelps concluded that the same rate of unemployment could fit many rates of inflation, so that the long-run Phillips Curve was not downward sloping, but instead vertical. They called the rate of unemployment of this vertical curve, the natural rate of unemployment.[1] The critique of the Phillips curve became more acute in the 1970s, when after the oil shocks, both inflation and unemployment rates have risen in the West, in the famous phenomenon of stagflation.[2] This, of course, contradicted the concept of a trade-off between inflation and unemployment.

Although the critique was very important, it did not end the discussion and research on the Phillips Curve. Both inflation and unemployment are important economic variables, and the links between them are therefore important as well. Over the years, research has shown that there is a significant relationship between unemployment and inflation, but it is more nuanced than the original Phillips Curve. Appendix 7 shows that under simple and plausible assumptions, there is a negatively sloping curve not between unemployment and inflation, but between unemployment and the change in the rate of inflation over time. In other words, if the rate of unemployment is high, inflation declines over time, while if unemployment is low, inflation rises over time. Only if unemployment is at its natural rate does inflation remain constant. This is why economists call the natural rate of unemployment the "non-accelerating inflation rate of unemployment" (NAIRU).

According to appendix 7, inflation declines if either unemployment is high (due to pressure on wages to fall) or the currency appreciates (which reduces demand for domestic goods, as imports become cheaper). However, appreciation of the currency and reduction of aggregate demand for domestic goods also increase unemployment. Hence, all steps to lower inflation involve high unemployment. The intuitive reason for this result is that unemployment is required to break the inertia of rising prices. The stabilization plan in 1985 succeeded in lowering inflation drastically without unemployment, because the government broke the market dynamics of pricing by controlling both prices and wages for a limited period. It could not do it later on, as the economy had to return to market pricing. Hence, after 1985, any further attempt to reduce inflation had to involve an increase in unemployment.

This is therefore a plausible explanation for why inflation in Israel declined so slowly after 1985. The government and the Bank of Israel were reluctant to create unemployment in order to lower inflation further. What enabled the decline of inflation were two episodes of unemployment, which were not caused by direct disinflationary policy but by other events. However, these two spells of unemployment put downward pressure on inflation nevertheless. The two episodes demonstrate how the theory of the Phillips Curve explains the decline in inflation in 1992 and in 1999.

Two Episodes of Unemployment

In 1990, a great wave of immigration from the ex-Soviet Union began. In 1990 and 1991, nearly 200,000 people immigrated each year, and in the following years, several tens of thousands of immigrants arrived each year.[3] This immigration had two seemingly contradictory effects. On one hand, it pulled the economy out of the recession that had begun in 1989 and triggered an economic boom, as described in chapter 7. On the other hand, the entry of immigrants to the labor market increased the supply of labor and with it, unemployment, as it took immigrants time to find jobs.

Although this was not recessionary unemployment, caused by low demand for labor, it was unemployment nonetheless, and it pushed wages down. The rate of unemployment rose to 9.6 percent in 1990, 10.6 percent in 1991, and peaked at 11.2 percent in 1992. In that year, the inflation rate dropped from 18 percent to 10 percent. Although the Bank of Israel did not create the unemployment to drive inflation down, it used the phenomenon nonetheless. It did so by adding to the unemployment the required disinflationary monetary policy. Since the exchange rate was the nominal anchor, the central bank had to lower the rate of depreciation. Here came the unique contribution of the governor of the Bank of Israel at the time, Jacob Frenkel.[4]

Michael Bruno had already set an exchange rate band for the New Israeli Shekel in the late 1980s. Since inflation continued at an annual rate of 18 percent, the bank had to shift the band up occasionally. This prompted speculative attacks on the dollar. To avoid such attacks, Frenkel replaced the flat exchange rate band by an upward-sloping band when he became governor. The slope of the band both reflected the rate of inflation and affected it, since this was the main nominal price that the bank controlled. In 1992, when unemployment was high and inflation went down to around 10 percent, Frenkel lowered the slope of the band. In addition, he raised the interest rate, which increased the demand for NIS assets, reduced the demand for dollars, and thus lowered the exchange rate further to the bottom of the band.

The high interest rate policy of the Bank of Israel angered the business community and exporters especially, and they criticized Frenkel strongly. The Ministry of Finance joined the critique as well, officially due to concern for exports, but it could have had additional motives. Perhaps the Ministry of Finance did not like the new independence of the Bank of Israel. Perhaps the Ministry of Finance worried that the higher interest rate might increase interest payments by the government. However, Frenkel coped well with the political critique, both by handling the media successfully and by maintaining excellent relations with the prime ministers of his tenure, first Rabin, then Peres, and finally Netanyahu.

Frenkel and the Bank of Israel continued with their policies and remained focused on keeping inflation low. Indeed, after 1992, inflation remained at the new rate of 10 percent annually. However, keeping interest rates high and exchange rates low created significant challenges to

monetary policy. The bank had to purchase large amounts of foreign currency in order to prevent the exchange rate from falling below the lower bound of the band. Such purchases of foreign currency could lead to expansion of the quantity of money, so the bank had to sterilize it, to prevent inflationary pressures. The next section in this chapter examines how the central bank did this.

The assassination of Prime Minister Rabin in November 1995 and the weakening of the Oslo Process following it led to a recession in the years 1997–1999, as described in chapter 7. The rate of unemployment, which had already declined as immigrants began to find jobs, rose again. From the low rate of 6.6 percent in 1996, it rose to 7.5 percent in 1997, to 8.6 percent in 1998, and to 8.9 percent in 1999. This recessionary unemployment put a downward pressure on wages and thus enabled another decline in inflation.

Indeed, the Bank of Israel used the opportunity and pushed inflation down from an annual rate of 10 percent to an annual rate of 2 percent. As in the previous decline, it used a contractionary monetary policy to lower the exchange rates. It did so by keeping interest rates high but also by significantly expanding the exchange rate band in 1997. This expansion enabled the bank to push the exchange rate further down. The Ministry of Finance opposed the widening of the exchange rate band, but the prime minister supported the position of the Bank of Israel. As a result, Minister of Finance Dan Meridor resigned after 1 year in office. The central bank won a political battle, but more importantly, it succeeded in using the recession to further lower inflation. From 10.6 percent in 1996, 7 percent in 1997, and 8.6 percent in 1998, inflation fell to 1.3 percent in 1999. From that year on, inflation remained low, both during recessions and in booms. Its average annual rate in the years 1999–2018 was 1.5 percent.

The gradual decline of inflation after the stabilization program, from an annual average rate of 18 percent to a low rate of 1.5 percent, is therefore a story that fits well the theory of the Phillips Curve. The government hesitated to reduce aggregate demand to create unemployment, which is why it took 15 years for inflation to decline. However, when unemployment increased exogenously, due to other events, the Bank of Israel took advantage and lowered inflation. It happened twice, first when unemployment increased due to immigration, and second when obstacles in the Oslo Process created a recession. In both cases, the Bank of Israel lowered the exchange rate, in addition to unemployment, mainly by raising the interest rate. As this story shows, the contribution of Jacob Frenkel, the governor of the bank in those years, to the success of the disinflation was crucial.

The disinflation had significant effects on the portfolios of Israelis. First, the public returned to holding domestic money, as shown in figure 9.2 in chapter 9. Second, the public began to hold fewer indexed assets and instead to hold NIS-denominated bonds. Indexation of bonds has a long history in Israel, beginning in the British period. In 1985, at the peak of inflation, all assets held by the public were either CPI or dollar indexed, or were shares, which are indirectly indexed through profits. In 2018, 33 years later, 40.5 percent of the assets of the public were CPI or foreign currency indexed, 22.5 percent were shares, and 37 percent were nonindexed bonds.[5] This is an impressive testimony to the success of the Israeli disinflation.

Inflation Targeting in Israel

In the long process of disinflation, the Bank of Israel used not only the two episodes of high unemployment and not only monetary policy to lower the exchange rate, but also a new policy

tool called “inflation target.” During the 1990s, it became popular in many developed countries, and Israel joined the club as well. To use this tool, the government sets an inflation target for the central bank, which can be either a strict inflation rate or a band within which inflation must be maintained. The government can set an annual target or a long-term target for many years. The central bank has to use its tools of monetary policy to meet the inflation target. This policy tool was first implemented in New Zealand in 1990, and since then has spread to more than thirty countries. Israel was one of the first to adopt inflation targeting in 1997, although it has used the policy informally since 1992.

TABLE 10.1. Inflation targets and actual rates of inflation, 1992–2018 (percent)

Year	Inflation target	Actual rate of inflation
1992	14–15	9.4
1993	10	11.2
1994	8	14.5
1995	8–11	8.1
1996	8–10	10.6
1997	7–10	7.0
1998	7–10	8.6
1999	4	1.3
2000	3–4	0.0
2001	2.5–3.5	1.4
2002	2–3	6.5
2003–2018	1–3	1.3

Source: Data are from Bank of Israel (2007).

The Bank of Israel and the Ministry of Finance first used the term “inflation target” in 1992, when they tried to forecast the rate of inflation early in the year, to determine the slope of the exchange rate band. They estimated that the inflation rate would be between 14 and 15 percent, but the actual inflation rate was 9.4 percent. In the following years, the inflation target became more ambitious. Also, as the exchange rate became more flexible, with the widening of the band, monetary policy focused more on the inflation target and less on the exchange rate. Table 10.1 describes the inflation targets and actual inflation rates over the years.

The transition to an inflation target regime required significant changes in both monetary thinking and in the implementation of monetary policy. First, in an inflation target regime, the nominal anchor of monetary policy is no longer the quantity of money, or the exchange rate, as is common in most economic textbooks. In such a regime, the nominal anchor is the price level itself. Since the target determines by how much prices will rise this year, and since the price level of last year is given, this necessarily determines what this year’s price level should be. The role of the central bank is to adjust the quantity of money so that the price level should fit, more or less, the price implied by the inflation target.

Such thinking did not come easy for many economists. While in the past, they viewed the price level as an endogenous macroeconomic variable, now it became a nominal anchor, that is, an exogenous policy variable. While in the past, economists viewed the quantity of money as a major exogenous policy variable, under the new inflation target regime, the quantity of money has become an endogenous variable, adjusted to reach the required price level. However, shifting

to the new inflation target regime was more than just an intellectual challenge. It also required new tools to adjust the quantity of money, or more precisely, high-powered money.

To understand these tools, we need to take a close look at the balance sheet of the Bank of Israel. The bank holds the following main assets:

1. The largest asset is foreign currency reserves, held mainly in banks abroad. There are reserves in many currencies, but mainly in dollars. The reserves are short-term liquid assets, with low return. The foreign reserves increased during the mid-1990s, when the bank raised interest rates and the public reacted by selling foreign currency. The bank had to purchase foreign currency to prevent the exchange rate from crossing the lower bound of the band. Foreign currency also arrived, due to large foreign investments in the first years of the Oslo Process. In the late 1990s, reserves became more stable, as the bank reduced its intervention in the foreign exchange market. The widening of the exchange rate band in 1997 reduced the need for intervention. In the early 2000s, the government canceled the exchange rate band, and the exchange rate became fully flexible. Hence, during the 2000s, foreign reserves did not change much. However, toward the end of the decade, Stanley Fischer, governor of the Bank of Israel since 2005, began to purchase foreign currency proactively. The stated goal was to avoid appreciation, which would hurt Israeli exports, but there might have been other reasons as well. One explanation was to support the low interest rate, and in this sense, the policy was similar to that of "quantitative easing" in the United States and Europe. In addition, unconfirmed media reports claimed that the accumulation of foreign reserves was due to a possible Israeli attack on Iran. The purchases increased the foreign reserves significantly, as shown below.
2. Another asset is the "monetary loan" to commercial banks. These loans enable commercial banks to overcome shortages in liquidity and are similar to window lending in the United States. The Bank of Israel decides and announces monthly the interest rate on such loans. This interest rate is the main tool of monetary policy in Israel, as in most other countries.
3. The bank holds few government bonds and does not trade much with them, unlike the US Fed. One reason is that it might jeopardize the Non-Printing Law.
4. A unique asset of the bank is government long-term debt, a reminder of the period of high inflation. It is the government overdraft from that time, kept as a dollar-indexed debt to the bank. The government is not required to pay it back.

On the other side of the balance sheet of the Bank of Israel are the following liabilities:

1. The deposit of the government in the Bank of Israel is a liability, through which the government manages its expenses and revenues. Withdrawing money from the deposit for expenditures injects money into the economy, while depositing public income in the deposit removes money from circulation. The Non-Printing Law puts severe restrictions on the overdraft in this deposit, both at each occurrence and on average during a year.
2. MAKAMs are short-term loans of 1 year maturity, issued monthly by the Bank of Israel. Unlike the central banks of many other countries, the Bank of Israel can issue bonds like the treasury. However, the Ministry of Finance issues long-term bonds of more than a year, while the bank issues short-term bonds only. The bank uses MAKAMs to absorb money from the public. Initially the government put a cap on the quantity of MAKAMs but removed the limit in the 2000s.

3. A third liability of the bank are deposits of commercial banks. These should not be confused with the standard reserves deposited by commercial banks. The Bank of Israel began to offer commercial banks such deposits in the mid-1990s, when it had to reduce the quantity of money, but it could not do it by selling MAKAMs, as it hit the upper bound on these bonds.[6]
4. The fourth and most important liability of the Bank of Israel is high-powered money, which is the cash held by the public and reserves deposited by the commercial banks. The size of this liability is the ultimate target of monetary policy.

We can use the balance sheet of the Bank of Israel as a framework to analyze its monetary policy. If the bank purchases foreign currency, it increases high-powered money. It can sterilize this monetary expansion in three possible ways. It can reduce the monetary loan to commercial banks, which requires raising the interest rate. It can sell MAKAMs to the public. Or it can offer commercial banks more deposits. Table 10.2 describes the use of the various monetary tools by the Bank of Israel in the years 1985–2018.

The first thing we learn from table 10.2 is that government injections were small throughout the period and even negative in most years, except during the immigration wave in 1990–1994. This is the result of the Non-Printing Law. A second conclusion that emerges from the bottom row in table 10.2 is the large increase in high-powered money immediately after stabilization in 1985. The second row in table 10.2 describes net expenditure of the Bank of Israel itself, which consists mainly on net interest payments. It shows that since 1995, the bank has had net losses on its assets and liabilities.

The third row in table 10.2 confirms the story told above, of two main periods of purchasing foreign currency. One was in 1995–1999, when the bank protected the exchange rate from falling below the band. The second began in the late 2000s and continued until 2018. The sterilization of these purchases of foreign currency also appears in table 10.2. In the years 1995–1996, the bank reduced monetary loans by 4.5 percent of GDP. Then this tool reached its limit, as the loan cannot be negative. In 1995, the bank also sold MAKAMs to the public, equal to 1 percent of GDP, but that tool was limited as well, due to the cap on MAKAMs. The need for sterilization was still great, as the accumulated injection from purchases of foreign currency in 1995–1997 was 14 percent of GDP. Since the Ministry of Finance refused to lift the cap on MAKAMs, the bank circumvented it by offering deposits to commercial banks. Table 10.2 shows that these deposits contributed significantly to sterilization.

TABLE 10.2. Changes in the balance sheet of the Bank of Israel, 5-year averages, 1985–2018 (percent of GDP)

Years	1985–1989	1990–1994	1995–1999	2000–2004	2005–2009	2010–2014	2015–2018
Government injection	0.62	2.66	0.74	−0.23	−1.25	−0.37	−0.27
Net costs of the Bank	0.06	−1.94	0.78	0.97	0.00	0.21	0.09
Purchase of foreign currency	0.36	−1.48	2.90	0.00	3.03	2.15	1.89
Monetary loan	1.22	1.22	−0.91	0.00	0.00	−0.01	0.00
Short-term bonds (MAKAM)	−0.32	0.16	−0.23	−1.46	0.45	−0.74	0.49
Deposits of commercial banks			−3.35	1.10	−1.59	−0.49	−1.46
High-powered money	1.96	0.66	0.53	0.38	0.64	0.74	0.73

Source: Data are from Bank of Israel (2019c, table 3.A.12(2)).

During the years 2000–2004, under Governor David Klein, the Bank of Israel did not intervene in the exchange market at all, as shown in table 10.2. The policy changed dramatically under Governor Stanley Fischer, who began to purchase foreign reserves in large quantities. Governor Karnit Flug continued this policy in 2013–2018. This time, the main tools for sterilization were the deposits of commercial banks. However, this time the Bank did not fully sterilize these purchases, and high-powered money increased, as shown in the bottom row of table 10.2 and in figure 9.2 as well.

The Independence of the Central Bank

The story of disinflation after 1985 is therefore not only a story of the Phillips Curve but also of growing independence of the Bank of Israel. Disinflation became possible not only because of the two episodes of unemployment, but also because of the active contractionary policy of the bank. This policy faced stiff opposition from the business community and from the Ministry of Finance, which is very powerful in Israel.[7] However, the bank insisted on its contractionary monetary policy in order to bring inflation down, and this struggle gradually increased its independence. First, it learned how to build allies in the government who supported its disinflationary policies. Second, during this struggle, it also created new tools, such as the inflation target and deposits of commercial banks. As the saying goes: The Bank insisted on implementing its policy, and when it faced a closed door, it came in through the window.

The independence of a central bank is very important to the success of monetary policy. Many studies have shown that the more independent the central bank is, the lower the rate of inflation will be.[8] However, the independence of the Bank of Israel still faces significant obstacles. The first one is the cost of monetary policy, which is a general problem facing other central banks as well. Monetary policy affects fiscal policy in two ways. First, a higher interest rate raises the interest payments of the government on its debt. Second, the government is the owner of the Bank of Israel. As such, it receives its profits, which are part of the annual income of the government. If profits are low, the government loses income. The profits of the central bank might not be large relative to the government's total budget, but they can be significant relative to the deficit.

We next examine how monetary policy affects the profits of the Bank of Israel. The bank receives foreign interest payments on its reserves, but it pays domestic interest on its monetary tools, like MAKAMs or bank deposits. A simplified calculation, assuming that all domestic interest rates of the bank are similar, leads to a formula that profits are equal to a multiplication of the foreign reserves by the difference between the interest rate on foreign reserves and the domestic interest rate. Hence, a higher domestic interest rate reduces profits of the bank. Indeed, table 10.2 shows that in 1995–2004, the costs of the Bank of Israel were close to 1 percent of GDP, which is rather high relative to the deficit, which was on average 3 percent of GDP. No wonder the Ministry of Finance opposed the high interest rates, as they reduced its income and increased its interest payments as well.

Since 2005, the costs of the Bank of Israel have declined significantly, mainly due to the lower interest rates after the financial crisis in 2008. This improved relations between the bank and the Ministry of Finance. However, a new tension emerged as the bank began to increase its foreign reserves in 2008. From $40 billion in 2008, reserves increased to $76 billion in 2011, to $86 billion in 2014, and to $115 billion in 2018.[9] As a result, the costs of monetary policy

increased to an average level of 0.15 percent of GDP, according to the second row in table 10.2. It is therefore not surprising that the Ministry of Finance expressed unhappiness with the hoarding of foreign currency.[10]

However, the independence of the Bank of Israel faces additional obstacles, which are more specific to Israel and its history. From its establishment in 1954, the bank viewed itself as part of the Zionist project, destined to support its economic success.[11] The first governor of the Bank of Israel was David Horowitz, a prominent Zionist leader, whose loyalty to the Zionist project and its needs was absolute. As a result, the Bank of Israel developed as a professional institute but also with the highest devotion to the Zionist goals, as set by the government. The governors who followed Horowitz after 1971, Moshe Sanbar and Arnon Gafny, also came from the public sector and were very attentive to its needs. Therefore, when the government ran into budgetary difficulties during the intensification of the Israeli-Arab conflict after 1967, the bank came to its help and looked the other way when the government increased its overdraft in its deposit at the bank.

It took time and effort to overcome this heritage of serving the government and to build the independence of the central bank. An important step was to appoint world-renowned professors as governors, such as Michael Bruno, Jacob Frenkel, Stanley Fischer, and Amir Yaron. Other governors came from within the bank, like David Klein and Karnit Flug, but were known to be independent before their nomination. Building the independence of the bank included also several legislative initiatives, like the Non-Printing Law of 1985, and the new Bank of Israel Law of 2011, which established a Monetary Committee that decides on monetary policy.

However, history planted some additional obstacles to the independence of the Bank of Israel. An important such obstacle is the role of the central bank as the economic advisor to the government, which does not exist in other countries. Early in 1954, the research department of the Bank of Israel consisted of a unique group of high-quality professional economists, who could help in advising the government on economic policy. However, today there are many good economists elsewhere, so the government can create an independent body that will produce good economic advice. This has not happened yet. I think that the role of economic advisor hurts the independence of the bank in many situations. One recent example occurred in March 2018, when the Bank of Israel Report on 2017 criticized a housing project, which was a favorite of Moshe Kahlon, the minister of finance at the time. He immediately announced that he would not support a second term of governor for Karnit Flug. The nomination of a governor is a joint decision by the prime minister and the minister of finance. This episode therefore demonstrated how harmful the role of economic advisor can be to the independence of the central bank.

Commercial Banks and Financial Intermediation in Israel

In the market for money, the demand for liquidity by the public meets the supply of money by the Bank of Israel and by commercial banks. To better understand commercial banks, this section focuses on their role as financial intermediators. The first theory of banks as financial intermediaries appeared in Diamond (1984). In this paper, the role of banks emerged from asymmetric information between lenders and borrowers. This asymmetry requires monitoring of borrowers by lenders. However, such monitoring is costly. Hence, if many lenders lend to a single borrower, which is usually the case when borrowers are corporations, lenders can benefit from a single institution that will conduct the monitoring for all of them. Hence, the financial

intermediary acts as a “delegated monitor,” as Douglas Diamond calls it.

There are many types of financial intermediaries, like commercial banks, investment banks, savings and loan banks, pension funds, provident funds, and more. However, commercial banks tend to be the main financial intermediaries. The reason is their role as providers of liquidity through checking accounts. While other financial intermediaries need to pay their depositors a return on their funds, a commercial bank does not pay interest on some of the funds it raises, namely, on checking accounts (demand deposits). Therefore, commercial banks have an advantage over other financial intermediaries, as their funds are cheaper. This makes commercial banks the main financial intermediaries.

Historically, financial intermediation was especially important in Israel, due to the need to finance a fast-growing economy. Israeli commercial banks controlled financial intermediation for the above reason, but also because most funds arrived through the government, like Jewish donations, West German reparations, and US aid. The government preferred to channel the money through the commercial banks, since most banks belonged to Zionist organizations. The main one was Bank Leumi, controlled by the Jewish Agency. Bank Hapoalim (“workers’ bank”) belonged to the Histadrut. The Hamizrachi Bank belonged to the religious movement Hapoel Hamizrachi, the precursor of the religious party of today.[12] Only Discount Bank was a large private bank. The government not only channeled credit through these banks but also decided who would receive credit. Such “directed credit” went to projects and sectors that the government wanted to promote.

Not only the government but also the Jewish investors from abroad preferred the Zionist commercial banks. Hence, the control over financial intermediation by commercial banks in Israel was stronger than in most other countries. The commercial banks not only controlled most lending, but they also gradually came to control other channels of financial intermediation, such as provident funds and mutual funds. Only the pension funds did not belong to the commercial banks but to the Histadrut until 1995, when pension funds went through a drastic reform. However, before the change, pension funds invested 93 percent of their assets in special designated government bonds, which paid a real return that was higher than the market. Thus, these bonds included a subsidy to pensions. It is therefore hard to view these past pension funds as true financial intermediaries.

The strong position of commercial banks as major financial intermediaries began to be shaken in the mid-1980s, as result of various dramatic shocks. Most prominent was the bank shares debacle, which exploded in 1983 and hurt badly the reputation of the banks.[13] The stabilization of 1985 ended the use of “directed credit.” After the government bailed out the major banks, it sold them to private owners, which ended their long, close ties with the public sector. In 1995 and in 2003, the government reformed pension funds. It reduced drastically the amount of designated bonds they could hold, which forced them to increase their direct investments. As a result, pension funds became real financial intermediaries and began competing with the banks.

Another erosion of the position of commercial banks as financial intermediaries was the development of an active market in corporate bonds during the 1990s. In the late 1990s, the government restricted banks from holding large companies in their portfolios. In the mid-2000s, the Bachar governmental committee removed provident funds from the commercial banks. These funds ended up mainly in the insurance companies.

Table 10.3 demonstrates the decline of commercial banks as financial intermediaries. Share

financing is rising steadily, from 50 percent in 2001 to close to 74 percent of total value in 2017. Credit by commercial banks to the business sector declined strongly, from about 41 percent to 16 percent of market value during this period. In terms of GDP, it declined from 60 percent to 30 percent of GDP. Shares replaced most of the decline of bank credit. The change in corporate bonds was rather small, 3 percent of market value over the period. Finance by foreign investors did not rise much, except for the years 2010–2015, and then it declined sharply. One possible explanation could be that Israel impressed foreign investors by dealing with the global financial crisis so well, so they invested temporarily in the country.

TABLE 10.3. Finance of nonfinancial business sector, selected years, 2001–2017 (percent of market value)

Year	2001	2005	2010	2015	2017
Debt to commercial banks	40.7	27.1	21.0	16.3	15.7
Corporate bonds	5.1	8.6	10.2	8.1	8.0
Shares	49.5	68.4	65.8	70.8	73.7

Source: Data are from Bank of Israel (2019c, table 4.A.29).

The decline in the scope of financial intermediation by commercial banks in Israel was indeed dramatic, as shown in table 10.3. However, it did not affect their profitability by much. The profit rate, or the return on equity, of commercial banks was low in 2001–2003, at 5.5 percent on average, but these were recession years, as discussed in chapter 7. The rate of profit of commercial banks rose to 15 percent on average in the years 2004–2007, when Israel came out of the recession. In 2008, as the global recession hit Israel, the rate of profit of commercial banks fell to 0.3 percent, but it rose immediately to 9 percent in 2009. It has remained at an average rate of 9 percent until 2018.[14]

One possible explanation to the high profits of commercial banks, despite the decline of their share in financial intermediation, is lack of competitiveness in the banking sector. This is clearly a concentrated sector. There are five large banks, Leumi, Hapoalim, Discount, Hamizrachi, and the First International Bank, which together held 96 percent of the market, measured by banking credit, in 2018.[15] However, high concentration in banking sectors is common in many countries. Nevertheless, there are other indications for low competition in the banking sector. One is that the last new bank that entered the market was the First International Bank in the 1970s. Another indication is that Israeli banks charge high fees from customers, in international comparison. Another indication is the absence of active foreign banks in Israel. There are also studies that document low competition in the banking sector on the side of depositors.[16]

It is hard to explain why competition is low in the Israeli banking sector, and this issue certainly deserves more in-depth research. However, I offer one explanation here: the lack of institutional deposit insurance in Israel. Such insurance is a very common institution in Western countries. It insures deposits in commercial banks up to a certain amount, like $200,000 in the United States. It is usually a governmental institute, like the Federal Deposit Insurance Corporation (FDIC), which routinely collects insurance premiums from the individual banks. Naturally, such an institute also supervises banks, mainly to determine each bank's insurance premium. Israel is unique in not having deposit insurance. According to Demirgüç-Kunt, Kane, and Laeven (2014), Israel and San Marino are the only two countries in the wider European region that do not have institutional deposit insurance.

In Israel, bank deposits are only de facto insured by the Bank of Israel, as it has always rescued deposits when banks collapsed in the past. However, such an informal deposit insurance is very different from an explicit institutional insurance, especially in its effects on competition among banks. One effect is due to the difference between established well-known banks and a new bank. A new bank might find it difficult to persuade people to deposit money in its branches. Depositors might not be sure that the Bank of Israel will save such deposits in the same way that it has saved deposits of established banks. Hence, only a formal deposit insurance can overcome the hesitation to deposit in a new bank.

The lack of formal deposit insurance has a second negative effect on competition among banks. With the current arrangement, the cost of rescuing deposits in case of a bank failure falls entirely on the Bank of Israel. This creates an incentive for the central bank to do everything in its power to prevent such failures. It can do so by pursuing extreme financial stability in banking, by actually protecting banks from competition, as there cannot be competition without the entry of new banks and the exit of other, less successful banks. One possible collusion between the large banks is their high transaction fees, which might enjoy tacit support from the supervisor of banks at the Bank of Israel. While I cannot present evidence for such behavior by the Bank of Israel, I can point out the incentive stemming from the lack of explicit formal deposit insurance.

Why doesn't Israel have formal deposit insurance, like all other developed countries? Actually, the Bank of Israel thoroughly investigated this possibility more than 20 years ago, so it is not due to lack of knowledge. My guess is that there is significant institutional and political opposition to creating such an institution. Commercial banks oppose it for two main reasons. First, they prefer de facto insurance, as they do not have to pay for it. Paying insurance premiums might reduce their profits, even if they pass part of the cost to depositors. Second, they are afraid it will increase competition and reduce profits. The supervisor of banks in the Bank of Israel is also in opposition. A deposit insurance institution will also supervise banks, as it does in the United States and other countries. The Bank of Israel, like any administrative authority, does not like to give up power.

Interestingly, in 1954, at the establishment of the Bank of Israel, the famous economist Abba Lerner, who was an economic advisor to the Israeli government at the time, warned against two omissions in the new central bank. One was the lack of a monetary committee to decide on monetary policy. The second was the lack of an independent authority for deposit insurance. Only in 2011 did the new Law of the Bank of Israel establish a monetary committee. We are still waiting for deposit insurance.

The Role of Monetary Policy in Israel

In the early days of the State of Israel, the central bank, like other parts of the government, was totally dedicated to the mission of building the new nation; namely, it was dedicated to the Zionist project. The new state needed a central bank, to create its own currency and to supply the necessary liquidity to the public. In addition, the central bank wanted to help the government achieve the funds needed to boost investment in the young economy, so that it could keep growing fast. Thus, the first major role of the central bank was to support the urgent national goals, among them economic development and absorption of immigration. The bank supported price stability, but only as a means to attract investors and future immigrants, not as a primary goal.

The dedication to the national goals removed the commitment to price stability once the Israeli-Arab conflict intensified in 1967. The government faced a severe fiscal crisis, with a large deficit, which it could not finance. The Bank of Israel came to its rescue in two main ways. First, it enabled the government to increase its overdraft in the deposit at the bank, which entailed massive money printing and as a result, inflation. Second, the bank turned a blind eye to the commercial banks, who began to manipulate their shares. It did so because it understood that the government needed those banks to borrow money abroad. Hence, the commitment of the Bank of Israel to urgent national needs led it to overlook the spiraling bank shares debacle. This led to the bailout and the jump of inflation to an annual rate of 400 percent.

The stabilization in 1985 not only ended the episode of high inflation but was also the beginning of a gradual change in the goals of the Bank of Israel. From support of the general national goals (namely the needs of the Zionist project), it transformed into a more standard central bank. However, the dedication to wider national goals has not yet fully disappeared. One example of this dedication is that it has kept its role as an economic advisor to the government. As long as the Bank of Israel keeps this role, it is still vulnerable to calls of duty to help the nation in various ways. This might even interfere with other standard goals of the bank, like price stability and well-functioning financial markets.

This dilemma, between the classic goals of a central bank, and the national wider goals, is not unique to Israel. Such tension appears in many young nations that go through a process of rapid economic development and nation building. Hence, people from such young countries might find the Israeli experience interesting and illuminating. Learning to focus on the traditional and narrower goals of the central bank strengthens it, rather than weakens it, because this focus bolsters the independence of the central bank. It is also part of growing up as a nation. The Bank of Israel learned this lesson only after suffering serious setbacks, like high inflation and a bank share debacle. Let us hope other countries will learn these lessons less painfully.

1. See the penultimate section in chapter 7 for a measurement of the natural rate in Israel.
2. See Bruno and Sachs (1985).
3. See chapter 8 for a detailed analysis of this immigration wave.
4. Frenkel replaced Bruno as governor of the Bank in 1991 and served until 2000.
5. Bank of Israel (2019c), table 4.A.1.
6. The commercial banks can make deposits of foreign currency (called “swaps”) or of domestic currency (called “PAZAKs”), which are short-term deposits.
7. See chapter 12.
8. An early and famous paper is Alesina and Summers (1993).
9. See Bank of Israel (2019a), figure 1.
10. Using the above formula, we can directly calculate the profit of the bank in 2009–2014. During this period, the average interest rate on foreign reserves was 1.73 percent (Bank of Israel 2019a, table 4). The average interest rate of MAKAMs was 2.12 percent (Bank of Israel 2015, table 3.A.1(1)). Hence, average profits in this period were −0.15 percent of GDP. This is similar to the cost shown in table 10.2.
11. Interestingly, before 1954, Bank Leumi, a commercial bank founded and owned by the Zionist movement, performed the functions of a central bank.
12. This Zionist-Religious party changed its name many times over the years.
13. See the fifth section in chapter 9.
14. Data on the rate of profit of commercial banks are from Bank of Israel (2019b), table 1.1.
15. These figures are from Bank of Israel (2019b), table 1.2.
16. See Ber, Yafeh, and Yosha (2001).

Lessons from Part III

This part of the book discusses various important issues for the Israeli economy: business cycles, the balance of payments, high inflation, the trade-off between inflation and unemployment, and the independence of the central bank. The first two parts of the book deal with issues unique to Israel, namely its long period of rapid economic growth in a less-developed region, and life in an armed national conflict. In contrast, the third part discusses issues that are not so unique to Israel. However, part III also identifies a uniqueness of the Israeli economy, as it experiences large shocks. This enables us to identify the effect of these shocks on the economy and improve our understanding of the economic mechanisms. The following paragraphs describe briefly what we can learn from this analysis.

First, the Israeli experience supplies strong support to some important economic theories. Chapter 7 on business cycles presents empirical support for the Keynesian theory on the importance of aggregate demand to business cycles. Chapter 8 shows that the radical changes in the trade deficit in Israel, from a large deficit of 25 percent of GDP to a balance, fit very well the now-mainstream theory of the intertemporal approach to the balance of payments. Chapter 9 shows that the well-known inflation tax model with rational expectations can fully explain the episode of Israeli high inflation, including its three distinct steps, of 45 percent, 120 percent, and 400 percent. Chapter 10 carries two important theoretical messages. It supports the main lesson of the Phillips curve on the role of unemployment in standard disinflations. Chapter 10 also shows how Israel developed its central bank independence and the obstacles on the road to this independence.

However, part III also delivers additional messages, which are of interest not only to Israel but to other countries as well. One message is that the Israeli-Arab conflict affects the economy in many additional ways. Chapter 7 shows how moving from the wide conflict to the narrow Israeli-Palestinian conflict increased the vulnerability of Israel to business cycles and caused more recessions. Chapter 8 shows that the period of intensification of the wide conflict contributed much to the rise of the trade deficit in the 1970s. Chapter 9 shows that the same intensification, which increased the public deficit, led to money printing and was a major cause of high inflation. Hence, analysis of the conflict in part II of the book lists only the direct effects of the conflict, while the conflict has much wider effects on almost every aspect of the Israeli economy.

Another interesting lesson from part III is about the interaction between professional considerations and broader political goals, especially in a young and developing nation. The main example is how the Bank of Israel printed money to help the government finance its deficit during the fiscal crisis. The bank sacrificed its professional obligation to price stability, in order to help the government when it faced harsh difficulties. During this episode, the central bank also averted its eyes from the manipulation of shares by the commercial banks for similar reasons.

Such commitment to the broad political goals happened to cause damage, as it led to a high inflation.

However, yielding to national goals was not always detrimental. Most professional economists warned against increasing the trade deficit, but the government followed the opposite policy. It wanted the economy to grow fast, which increased investment. It also wanted to raise the standard of living, to attract more immigrants, which increased consumption. Both goals increased the trade deficit. In hindsight, it seems that the politicians were right. The government financed a large part of the trade deficit by transfers, and in due time, the deficit declined to zero.

Chapter 7 even presents a case where the professionals overcame the politicians, and the result led to significant economic damage. In the mid-1960s the professional economists—and especially the Bank of Israel with pressure from the IMF—pushed toward a strong contractionary fiscal policy. The government accepted this recommendation, and the Mitun policy began in 1966. This contractionary policy led to a sharp decline in economic activity and a deep recession, much harsher than the original intention of the policy makers. In general, the relationship between professionals and politicians in forming economic policy is quite complex and deserves deep analysis. We return to this general issue in part IV of the book.

PART IV

Neoliberalism and Its Impacts

The West has been experiencing a significant shift in economic policy in recent decades, called "neoliberalism." During most of the twentieth century, public sectors increased, labor unions became stronger, and trade was somewhat restrained to protect home industries, but toward the end of that century, these policies reversed. Participation of workers in labor unions shrank significantly, and unions faced increasing obstacles and limitations. New trade agreements, the introduction of the World Trade Organization, and supra-national organizations like the European Union removed trade barriers significantly. In many countries, the supply of public services declined as well, as governments reduced their expenditures relative to GDP, which enabled them to lower taxes. Furthermore, governments not only reduced the scope of many public services but also supplied more of them privately, through outsourcing.

Economic researchers can contribute much to the debate on neoliberalism, both by analyzing what led to its rise and by analyzing how it affects the economy. I think that Israel can contribute a great deal to this analysis, as it had a very special experience with neoliberal economic policies that was both long and intense. There is a debate in Israel on when policy shifted toward neoliberalism. Some claim that it happened in 1977, when the right-wing Likud party won the election, after a long domination by the labor movement. Others claim that the crucial turning point was the stabilization plan in 1985, when the economy began to shift from government intervention to a market economy.[1] Interestingly, the prime minister in 1985 was Shimon Peres from Labor, although it was a unity government with Likud.

In this book, I claim that one has to look for deeper underlying processes to understand the shift to neoliberalism. Israel experienced significant government intervention in the economy in its early years, because it faced large national challenges. It had to absorb large immigration waves. It had to stabilize its borders after an intense war in 1947–1949, with displacement of sizable populations. Then, after 1967, it faced a significant intensification of the Israeli-Arab conflict, which also called for massive public intervention. Only after the peace with Egypt, when things calmed down, did the government begin to reduce its intervention. Hence, I maintain that the crucial date for the shift to neoliberalism is around 1980.

This shift was intense and widespread. It included cutting budgets, privatizing both state companies and public services, liberalizing trade, and weakening labor unions. We can therefore view it as a dramatic experiment in neoliberal economic policies. Part IV of the book describes this experiment and examines its effects on the economy. Chapter 11 describes interventionist policies in the Israeli economy and shows how these evolved because of urgent national needs rather than because of social ideologies. It then describes the process of privatization, which followed the peace with Egypt. Chapter 12 describes the decline of public expenditures since the early 1980s and examines its effect on economic growth. Chapter 13 studies inequality in Israel

and its determinants, among them the neoliberal policies.

1. See the title of Ben-Bassat (2002b).

11

Between Intervention and Markets

Left and Right, Socialism and Capitalism

In 1929, the World Zionist Organization, led by Chaim Weitzmann, together with other Jewish organizations, led by the president of the American Jewish Committee, Luis Marshall, established the Jewish Agency ("Hasochnut Hayehudit"). Its goal was to represent the Jewish Yishuv in Palestine before the British Mandate. The Jewish Agency quickly became the de facto government of the Jewish community. In 1935 the labor movement, headed by "Mapai" (the Party of the Workers of Eretz-Israel), took control of the Jewish Agency. Its leader was elected as chairman of the Jewish Agency. Mapai led the Yishuv and the Zionist movement firmly in all areas, focusing on absorption of immigration, defense, and economic development. It led to the establishment of the state in 1948, and governed it for almost 30 years, until 1977, when the right-wing Likud Party took over.

The rule of Mapai was more than a standard political rule. During its 44 years, it actually molded the new nation. Remember that in 1930, the Jewish community was only 170,000 people, while in 1977, it included 3 million. This is almost the creation of something out of nothing, and it shaped the country and the nation significantly. One of the common claims about the rule of Mapai, and of the labor movement in general, is that it created an economy with distinct socialist characteristics, because this was its Zionist-Socialist ideology. This claim appeared not only in the popular discourse but also in academic publications, such as Plessner (1994).

This issue requires some explanation of terminology. The various parties of the labor movement defined themselves as Zionist-Socialist. The term "socialism" meant mainly European style social democracy.[1] Although the agricultural settlements of the labor movement were collectivist socialist experiments, called "kibbutzim," this method of organization did not expand to the rest of the economy. The main socialist element of the labor movement was its strong support of public intervention in the economy. Below we discuss the question of whether such interventions reflected the socialist ideology or rather Zionism.

Returning to the claim of Plessner (1994) and others that the labor movement built Israel as a socialist society, it raises obvious questions. Why is Israel today so capitalist? When and how did this transition happen? Why did the socialist elements disappear so fast, or were they ever actually there? Chapter 1 begins to deal with these questions, citing Sternhell (1998), who claimed that the socialism of the labor movement was never genuine and only served as a tool for its main Zionist goal. While Sternhell was a political scientist who focused on political ideas, in this chapter, I examine this issue using economic data.[2]

If indeed Israel began as a socialist enterprise and only later became a capitalist state, we should expect to see monotonic dynamics of public intervention in the economy, from high intervention to low. However, this chapter examines empirically the dynamics of public intervention in the economy and shows that these dynamics were far from being monotonic. They actually tell us a much more nuanced story.

This chapter examines two main indicators of public intervention in the economy. One is public ownership of firms. The second is protection from international competition, both by taxes on imports and by subsidization of exports. Actually, public ownership of production exists in many capitalist countries, as governments own railways, electricity grids, water systems, and more. This is why many economists use the term "mixed economies" to describe modern Western economies. However, the share of public production in Israel in the past was larger than in most other countries. It included military industries, natural resources, communications, energy, commercial banks, and more. Furthermore, in addition to the government, the labor union Histadrut and the kibbutzim also owned firms. These were integral parts of the labor movement, committed to its Zionist-Socialist ideology. The chapter examines whether this public ownership reflected the Socialist or the Zionist part of the ideology.

Public and Private Ownership in the 1950s

During the British Mandate, the public sector, mainly the Jewish Agency and the Histadrut, controlled most of Jewish agriculture. However, much of the industrial production was private. According to Metzer (1998), the Zionist Organization supported a mixed economy, private-public, from the early days of the British Mandate, to encourage immigration of non-Socialists and private investment. Metzer (1998, p. 198) estimates that the share of the public sector in output did not exceed 20 percent. Aharoni (1976) presents a similar picture of the period:

> At least until World War II, nearly all of the Jewish economy in Palestine was built by private enterprise and private capital. The import of capital, from the First Aliyah until 1939, was mostly private. Most of the construction (which constituted about a third of the investments) at the time, most of ownership of citrus, and the large industrial plants in Palestine—were built by private entrepreneurs. National capital concentrated mainly in agricultural investments (excluding citrus).[3]

This situation began to change after the establishment of the state and during the 1950s. Now Mapai was not only the leader of the Jewish community, it was the sovereign and could shape the country much more than had been possible earlier. And indeed, the government nationalized several companies, both large and small, set up new companies, and its share in production increased. To see it more accurately, we turn to H. Barkai (1968), who studied ownership by sectors in the 1950s.

Barkai divided the Israeli economy into three sectors: public, cooperative, and private. The public sector included central government, municipalities, public NGOs, and the Jewish Agency. The cooperative sector included the labor union Histadrut, the kibbutzim, and the moshavim. Barkai calculated the share of each sector in net domestic product (NDP), which is GDP minus depreciation. Table 11.1 summarizes the findings of Barkai.

TABLE 11.1. Shares of three sectors, selected years, 1953–1960 (percent of NDP)

Year	1953	1957	1958	1959	1960
Public sector	19.4	20.9	20.0	21.6	21.1
Cooperative sector	20.3	20.6	20.0	20.3	20.4
Private sector	60.3	58.5	60.0	58.1	58.5

Source: From H. Barkai (1968, table 1).

Table 11.1 shows that the share of the public sector increased throughout the 1950s, the share of the cooperative sector remained relatively stable, and the private sector declined. The share of the public sector increased by 2 percent of output, which is a rise of 10 percent over the decade. This is a sizable increase, although its effect on ownership by the private sector was quite small, as it declined by only 2 percent.

The picture in each sector was similar. Barkai distinguished between three divisions in the public sector. The first provided free services, like education, law, and order. The second consisted of public enterprises, which provided goods and services for fees, like Israel Railways, the Post Office, and Port Authorities. The third division was made up of regular companies owned fully or partially (at least by half) by the government, within the Government Companies Authority. Barkai shows that from 1953 to 1960, the share of the first division (of public services) did not change much, from 14.8 to 14.3 percent of NDP. However, the two other divisions grew significantly. Their joint share in NDP increased from 4.6 to 6.8 percent, which is almost by half.

Barkai also divides the cooperative sector into several groups, companies owned by the labor union through the Company of Workers ("Chevrat Haovdim"), cooperatives, moshavim, and kibbutzim. He finds that the share of moshavim declined from 2.1 percent to 1.6 percent of NDP. The share of cooperatives did not change much. However, the share of kibbutzim increased from 2.4 percent of NDP in 1953 to 4.3 percent in 1960, mainly due to new industrial plants in kibbutzim, enabled by hiring new immigrants as outside workers in these factories. The share of companies owned by the labor union increased as well.

Hence, during the 1950s, the share of the public and the cooperative sectors in the economy increased. The government nationalized some large enterprises and created new ones as well. The main nationalizations were Dead Sea Works, Israel Electric Corporation, Haifa Oil Refineries, and the shipping company ZIM. The government also built new companies in important areas: military industries (Rafael, Israel Aircraft Industries), construction (Amidar, Afridar, Diyur Laoleh), airlines (El-Al, Arkia), finance (Bank Otzar Hachayal; Mifal Hapais, which is the national lottery), and trade and commerce (Shekem, shops for soldiers; Delek, an oil company; and Tahal, water system planning).

One could interpret these changes as strengthening Israeli socialism. H. Barkai (1968, p. 65) claimed that his findings "certainly indicate the great importance of socialist elements in the sectoral structure of the Israeli economy." He even projected: "If the sectoral structure will change in the near future, it will probably not be weakening of the position of the public sector."[4] However, some observations cast doubt on this interpretation. First, Mapai was extremely powerful in those years, as the founder and leader of the new state. Increasing the public sector and reducing the private sector by 2 percentage points were very minor changes and still left the private sector in control of more than half of the economy. If it really wanted to shift the economy toward socialism, Mapai could have done much more.

Furthermore, when the government made an effort to boost industry in 1954, appointing

Pinchas Sapir as minister of Industry, it focused on encouraging private investors. Aharoni (1976, p. 126) states: “The activity of the government focused on processing specific plans for industrial development, initiating factories, and offering these programs to local and foreign capitalists and to companies from public institutions, with endowing them with various benefits. … However, the government rarely entered as a partner to industrial companies in this period.”[5]

Instead of a shift toward socialism, I offer a different interpretation of the increasing intervention in the 1950s. It builds on the huge national challenges Israel faced, on one hand, and on the fact that the funds required to deal with these challenges came through the government, on the other hand. First, in 1948–1950, a large wave of immigration doubled the population of the country. The government housed many in abandoned Arab houses, mainly in Haifa, Lod, Ramla, Jaffa, and Jerusalem, but most immigrants were crowded into transitory camps, called “maabarot.” They lived in shacks and tents, hardly fit for human residence, in great density. Many immigrants searched for jobs, and the rate of unemployment was high at 14 percent. Hence, the government urgently needed to invest in housing and in job creation.

There was also an acute need to settle the new borders. During the 1948 war, Israel gained control over wide new areas left by the Palestinian refugees. Many refugees did not accept their situation and tried to return to their villages by night to farm their land. The army tried to stop them, and the Jewish National Fund destroyed all houses in the abandoned villages, but that did not solve the problem. The government realized that only by settling along the new lines could stabilize the borders permanently.[6]

Facing the pressures to invest in housing, employment, and settlements, the government lacked funding. Unlike previous immigrants, those who arrived after 1948—both the Holocaust survivors and Jews from Arab countries—were penniless. The government overcame the money shortage by relying on Jewish donations and by signing the Reparations Agreement with West Germany. As a result, the government became the main channel of finance for the economy. Thus, it could direct these funds to various investments in the economy.

In general, the government preferred to channel the funds to private investments. In a speech in the Knesset on February 14, 1956, the Minister of Finance Levi Eshkol said: “Industry is a main field for private investment of our citizens and of Jews from abroad. We will put at the service of industry many ways to order industrial equipment from the reparations.… We will be ready to help with loans, tax reductions and other benefits.”[7] However, in some cases, the situation required greater involvement of government and even nationalization, as the following examples demonstrate. The first is the Israel Electric Corporation.

In 1923, Pinchas Rotenberg founded the Palestine Electric Corporation, which received an exclusive franchise to supply electricity throughout the British Mandate. The board of directors was in London, and its shares traded on the London Stock Exchange. After 1948, the government demanded that the corporation supply energy to the effort of development and of settling the periphery, but the company failed to raise the required funding. Since the government had funds, it purchased 95 percent of the company’s shares in 1954, and it became a government company. The justification of the nationalization was not socialist but instead used nationalist arguments. In the Knesset discussion in 1953, Member of Knesset Aaron Zisling said: “The electric corporation has largely failed the development of the country.… Since the establishment of the state, it did not stand to its commitments to supply the electricity required to spin the wheels of industry.”[8]

Another large company that was nationalized was the Dead Sea Works. Moshe Novomeysky

established the Palestine Potash Company in 1929, and the company produced potash and bromide in two factories on the north and south shores of the Dead Sea. During the 1948 war, the company abandoned and destroyed the northern plant. The government demanded that the potash company operate its southern plant. After it failed to do so, the government established the Dead Sea Works in 1952, which purchased the equipment and assets of the potash company and began to operate the southern plant.

A third example was in the area of energy.[9] During the British Mandate, British oil companies set up refineries in Haifa for oil that came by a pipeline from Kirkuk in Iraq. It was the third largest such plant in the Middle East. When the war broke out in 1948, foreign oil companies, most notably Shell, preferred to stop selling oil to Israel. When Israel threatened to interrupt the functioning of the refineries, the British decided to continue to sell oil, but not openly. To facilitate this trade, the Israeli government established an oil company called "Delek," which had mixed ownership. In 1959, when the refineries deteriorated, the foreign oil companies sold them to the Israeli government. The refineries joined the government companies as well.

Another related story is about how private industrialists wanted to sell the cement company Nesher to the Histadrut, due to its financial difficulties. This is the only cement company in a country with a large construction sector, so it was a significant sale. However, Minister of Finance Eliezer Kaplan and the general director of the ministry David Horowitz prevented this sale. They worried that American Jewish businesspeople might be concerned about further expansions of ownership by the Histadrut and that it would deter investment in Israel.[10]

Interestingly, the government bought shares of companies in distress during the 1950s. The government preferred such support, because directly subsidizing them required approval by the Finance Committee in the Knesset. Interestingly, the State Comptroller (1954, p. 56) criticized sharply the results of these purchases of shares: "The influence of the government in these companies often does not fit its investment.… In many cases its representatives are a minority on the board, even though the investment of the government sometimes reaches as much as 90 percent of the long-run capital and loans." Such behavior does not look like nationalization that is trying to advance a socialist agenda.

These stories demonstrate that the government nationalized companies in the 1950s not due to a socialist ideology, but rather due to national considerations. The urgent need to build houses, create jobs, and settle the borders, combined with the fact that finance arrived through the government, led to greater involvement of the government in the economy. Sometimes the involvement manifested itself in direct ownership of firms. Sometimes it was semi-direct, when the government built financial companies (such as the Bank for Crafts and the Bank for Development of Industry) to help private investments. Sometimes the involvement was indirect, as the government channeled "directed credit" to private enterprises through commercial banks.

I therefore claim that the intensification of public intervention in the early years was not due to socialist ideology. It reflected the role of the labor movement as the leader of the nation and of the Zionist movement. Its goal was to deal with the crucial problems that the young state faced, and it utilized its position as the main channel for foreign finance. However, unlike other parties, the labor movement had greater willingness to intervene in markets, due to its social-democratic origins. One can say that labor was suspicious of businesspeople, fearing that they care more about profits than about the national interests. To some extent that fear reflected their experience in the moshavot, when landowners preferred the cheaper Arab workers to the Jewish workers.

Hence, it was more natural for the labor movement to intervene. The public understood it, and in view of the need for massive intervention, gave its overwhelming support to the labor movement in repeated elections.

Public and Private Ownership after 1960

H. Barkai (1968) examined the division of output between the three major sectors from 1953 to 1960. Unfortunately, I do not have such data after 1960, but the Central Bureau of Statistics publishes data on the division of workers in manufacturing among the three sectors. Hence, it is possible to analyze the dynamics of ownership after 1960 as well. Obviously, it is impossible to compare the two types of data, but it is possible to compare the trends. Table 11.2 presents the shares of industry workers in the three sectors for the years 1959–1972. Note, that in that period, the budget year began in April and ended in March, so the year 1959–1960 is mainly 1959.

TABLE 11.2. Distribution of workers in manufacturing among three sectors, in selected years,1959–1972 (percent)

Year	1959–1960	1960–1961	1962–1963	1963–1964	1965	1966–1967	1968–1969	1969–1970	1972–1973
Public sector	16.0	16.9	18.7	18.1	17.2	19.1	18.9	24.8	23.7
Cooperative sector	7.9	7.9	8.3	8.1	8.3	9.2	7.6	6.0	10.0
Private sector	76.1	75.2	73.0	73.8	74.5	71.7	73.5	69.2	66.3

Source: Data are from Central Bureau of Statistics (1962, table 9.1; 1963, table 9.7; 1964, table 13.3; 1965, table 13.3; 1966, table 13.5; 1968, table 13.4; 1969, table 12.3; 1970, table 12.3; 1971, table 13.2; 1972, table 14.2; 1974, 14.2; 1975, table 14.2). The data for 1965 are from a census, and some of the nonprivate workers are "other." I allocated them between the public and the cooperative sectors proportionally.

According to table 11.2, the dynamics of the division of industry between the three sectors were complex and not monotonic. In the early 1960s, the public and the cooperative sectors continued to grow, and the private sector declined, continuing the dynamics of the 1950s. However, this trend ended around 1962. In the years 1962–1965, the public and cooperative sectors stopped expanding, and the private sector even began to expand. During these years, it rises by 1.5 percentage points. In the years 1966–1967, there is a significant change, as the share of the private sector falls by 3 percentage points. This is a result of the recession in these years, as most of the unemployed in industry were from the private sector. However, the recession ended in 1968, as defense activity increased significantly. But the public sector kept increasing and the private sector declined dramatically, reaching 66 percent by 1972.

It seems that in 1962, the previous trend of growing intervention ends, and public ownership begins to decline slightly. This fits well the explanation in the previous section of the rise in public ownership due to urgent national needs. In the early 1960s, Israel had already met many of these needs. It built many housing projects, which enabled closing most of the maabarot. The state created many jobs, and the rate of unemployment declined to 3.6 percent in 1961. It also built many settlements along the borders, which became quieter after the Suez War in 1956. In addition, fast economic growth raised the standards of living. These achievements reduced the need for large public interventions. Indeed, the early 1960s saw dramatic changes in leadership. The founder of the state, David Ben-Gurion, retired in 1963, and Levi Eshkol replaced him. Pinchas Sapir became minister of finance. This leadership was favorable to the private sector and indeed, public ownership stopped growing and even declined slightly.

However, this short period of liberalization ended after the war in 1967, with the rise in

intensity of the wide conflict.[11] Much of the rise of the public sector was due to the defense industries, which grew not only because of the intensification of the conflict but also because of the arms embargo by France, which was until then the main arms supplier to Israel. All military industries expanded. The Israeli Military Industries (IMI, Ta'as) built the new tank "Merkava" and the new cylinders pontoon bridge. Israel Air Industries began to produce the fighter jet Nesher ("eagle"), based on stolen plans of the French Mirage 5 aircraft, and then an improved fighter jet Kfir ("lion cub"). It also developed the earliest versions of drones. Rafael (authority for arms development) also underwent considerable expansion, mainly developing various missiles. In addition to the expansion of defense industries, the government increased its support to the business sector due to a rise in intensity of reserve service, as discussed in chapter 5. As in the 1950s, the government had access to foreign finance, this time in the form of aid from the United States.

The new phase of increasing intervention, which began after 1967 with the intensification of the conflict, ended with the peace with Egypt, around 1980. Table 11.3 shows this change in trend after 1980. The defense industries went through a drastic reduction, which peaked with the decision to stop the project of the new Israeli fighter jet Lavi ("lion") in 1987.[12] However, the decline of public ownership went much further than the defense industries. The peace with Egypt marked the end of the era of large national needs. As a result, the public sector declined sharply, and in 2015 it was less than half of its size in 1980. The cooperative sector declined by more than half as well, and the private sector increased continuously throughout the following years.

Hence, tables 11.1, 11.2, and 11.3 show that public ownership increased during times of major national challenges, such as absorption of a large immigration, the need to stabilize the borders, or a considerable intensification of the Israeli-Arab conflict. These were also times of foreign finance reaching the country through the government. Hence, facing such challenges, the government did not hesitate to channel this finance to investment. Most of the finance went to private investments, but some increased public ownership as well. However, when the overall situation improved, the government stepped back and enabled the private sector to play a larger role in economic development. This was the case in the 1960s until 1967, and it has also been the case after the peace with Egypt.

TABLE 11.3. Distribution of workers in manufacturing among three sectors, in selected years, 1975–2015 (percent)

Year	1975	1980	1985	1990	1995	2000	2005	2010	2015
Public sector	14.8	16.9	16.0	11.6	8.1	7.1	7.2	7.1	7.5
Cooperative sector	16.3	11.6	17.4	15.4	13.7	11.3	6.3	5.7	5.3
Private sector	68.9	71.5	66.6	73.0	78.2	81.5	86.5	87.1	87.1

Source: Data are from Central Bureau of Statistics (1976, 1981, 1986, 1991, 1996, table 14.2 in all years), Central Bureau of Statistics (2003, table 20.8; 2008, table 20.8; 2013, table 20.10; 2018c, table 20.10).

This analysis also explains why Israeli public ownership was more extensive than in other Western mixed economies. It was not due to stronger Social-Democrat ideology, but instead to unique urgent national needs, especially the absorption of immigration and the Israeli-Arab conflict. Once these emergencies were addressed, liberalization and privatization were the leading policies. Interestingly, these large changes in economic policy did not coincide with the ruling party, Labor or Likud. The liberalization of the 1960s occurred under Mapai. The expansion of public ownership in 1968–1970 occurred under a national unity government with

the right-wing parties. The large privatization after 1985, shown in table 11.3, occurred under both Labor and Likud. Labor ruled in 1992–1996, in 1999–2001, and was a senior partner in the coalitions in 1984–1991 and 2001–2011. Hence, in 22 out of 33 years, Labor played an important role in the government and fully supported its policy of privatization, as shown in the next section.

Privatizing Public Companies

The previous section shows that public ownership declined significantly after the peace with Egypt. This section examines the details of this privatization. Actually, sales of state-owned companies began as early as the 1960s. In 1962–1977, the labor government sold its ownership in 64 companies, including Otzar Hachayal ("Bank of Soldiers"), the Caesarea Development Company, and Chevra Lehachsharat Hayishuv ("Israel Land Development Company").

However, privatization moved at slow pace. It did not accelerate even with the new Likud government in 1977, despite that government's declared support for privatization. The ability to appoint political supporters of the new government to boards of directors of public companies created strong incentives to delay selling these companies. In the late 1980s, a US consulting firm, Boston Investments, prepared a privatization plan for Israel. However, only after 1992, when Yitzhak Rabin formed a government headed by Labor, did implementation of the plan proceed at full speed. It was a result of the joint efforts of Rabin himself and Joseph Nitzani, head of the Government Companies Authority.

In general, privatizations were not easy to perform due to four main difficulties. First, they included not only complete companies, but also production units, such as Israel Aircraft Industries, telephone services, and Israel Post. The first step in privatizing such units was to turn them into state-owned companies and only then to sell them. The second difficulty was that every sale of a state company alters the status of employees, which requires an agreement with them, since otherwise the privatization might halt due to serious labor disputes.

A third difficulty arises from the fact that many public companies were natural monopolies. A company is a natural monopoly if its cost of construction is so high that it is not efficient to set up two or more companies of the same kind. For example, an electricity company is a natural monopoly in electricity transmission, because establishing an electric grid is very costly. As long as the state operates such natural monopolies, it can control their prices. However, once privatized, there is a need to strengthen regulation of the new private monopoly, or even create a new public utility commission to regulate it.[13] A fourth difficulty, prominent in Israel, are security constraints, as many state companies had close ties to the defense sector.

The overall number of companies privatized by the Government Companies Authority since 1993 is 43. This does not include the sale of the commercial banks that the government purchased in the late 1980s, due to its commitment to bail out the shares of these banks after the banking scandal, as described in chapter 9. That sale was also a privatization, since the largest three banks belonged to the public sector prior to the scandal. However, the following discussion focuses only on privatization of government companies.[14]

To find the overall value of these privatizations, I calculate the discounted present value of all sales in US dollars, using the average interest rate on federal securities during this period, which is 4 percent. The value was $13 billion in 2018, which is equal to 3.5 percent of GDP in 2018. In other words, if the government had deposited the receipts of all privatizations in an account that

pays interest of 4 percent, this would be the total value of the deposit by 2018. However, the annual flow of interest payments from this deposit would be 0.14 percent of GDP, which is not high at all.[15] Most privatized companies were small. The main companies by size were Dead Sea Works, sold in 1993 for $820 million; the telephone company Bezeq, sold for almost $1.5 billion; and the oil refineries in Haifa and Ashdod, which were sold in 2006 and in 2007 for a combined value of $2.3 billion.

It is interesting to examine which prime ministers began and pushed the privatizations, since the main contribution of the political leader is at the early stages of privatization, when solving problems with employees and overcoming political objections are crucial. Interestingly, the leading prime minister in privatization was Yitzhak Rabin, who began to privatize thirteen companies and completed most of them within a short period of 3 years. Next was Benjamin Netanyahu, who sold thirteen companies as well, but took 13 years to do so. Following him was Ariel Sharon, who sold eight companies in over 4 years. Ehud Olmert sold six companies during a 3-year term, and Ehud Barak sold only four companies, but his tenure was the shortest and lasted only a year and a half. These findings are in line with the general message of this chapter, that there is little difference between Likud and Labor in social-economic policies. Yitzhak Rabin and Ehud Barak privatized more intensively than their Likud counterparts did.

Interestingly, there are still many government companies that have not yet been privatized. These are mainly Israel Electric Corporation, Israel Railways, Israel Post, the Postal Bank, Israel Aerospace Industries, and Rafael—Advanced Defense Systems. The main reason for the delay of these privatizations is that these are natural monopolies and will remain monopolies even after privatization. For example, the infrastructure required for Israel Aerospace Industries is so large that it is not efficient to establish a competing company in Israel. It is definitely a natural monopoly with respect to its domestic client, the army.

Protection versus Openness

The first sections in this chapter deal with government intervention through ownership of production. This section introduces another type of intervention, in international trade, when governments protect domestic production from foreign competition. They do this by taxing imports, mainly through tariffs but also through other taxes as well.[16] Other protectionist policies are subsidizing exports or using commodity standards, which benefit domestic producers over imports. This section analyzes the dynamics of taxes on imports and subsidies to exporters.

Figure 11.1 presents the revenue from taxes on imports as a share of total imports in percent. The figure shows that in the 1950s, taxes on imports increased sharply, from around 5 percent in 1952 to around 24 percent in 1959–1961. Surprisingly, in 1962, the trend reversed sharply, and taxes went down from 25 percent to 7.5 percent in 1967.[17] From 1967, the trend changed again, and taxation of imports doubled to 15 percent in 1974. From 1975, the tax rate on imports declined, and today it is around 5 percent of total imports. This reflects a continued liberalization of trade since the mid-1970s. Figure 11.1 shows that this liberalization was not smooth, and there was a sharp decline in 1978–1981, following the famous “liberalization” of 1977, discussed in chapter 9. However, import taxes returned to trend in 1982, due to withdrawal from the liberalization, which failed miserably. Figure 11.1 shows another decline in taxes on imports in 1984–1985, when inflation became very high. This is due to the famous Tanzi-Olivera effect.

Figure 11.2 describes another protection against foreign competition, which is subsidies to

exports, described as a percentage of GDP. The government began to pay such subsidies in 1955, and then export subsidies increased rapidly and reached 3 percent of GDP in 1961. In 1962, the subsidies began to decline. However, since 1967, the subsidies have increased again and reached more than 5 percent of GDP in 1977. Since then, subsidies declined and are close to zero today. Just as for taxes on imports, export subsidies fell sharply after the liberalization of 1977, but they returned to trend after a few years.

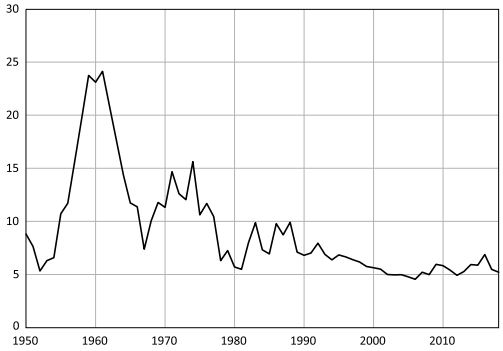

FIGURE 11.1. Taxes on imports, 1950–2018 (percent of imports).
Data are from Central Bureau of Statistics (1965, table 6.1; 1966, table 9.13; 1968, table 8.12; 1970, 1972, 1974, table 8.12; 1976, 1978, 1979, 1981, table 8.10; 1983, 1984, 1985, 1987, table 8.11; 1989, 1991, 1993, 1995, 1997, 1999, table 8.10; 2001, 2003, table 16.11; 2005, 2007, table 16.12; 2009, table 16.8; 2011, 2013, 2015, 2017, table 16.10; 2019, table 13.10).

Chapter 5 describes the rise in subsidies to exports after 1967. When the Israeli-Arab conflict intensified, more people went to reserve service more often and for longer periods, many for several months a year. This harmed businesses and especially exporters, so they demanded support from the government. It came through two main channels, subsidized credit and subsidies to exports. Figure 11.2 shows the rise in the subsidies to exports.

The dynamics that figures 11.1 and 11.2 describe are very similar to the dynamics of public ownership of production. Public intervention increased in the 1950s, but in 1962, the policy changed drastically to one of significant liberalization. This liberalization came to a stop in 1967, when public intervention returns strongly. It stops in the late 1970s and from then on, the economy goes through a significant liberalization until today.

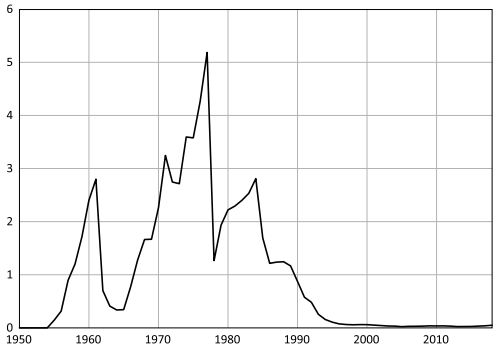

FIGURE 11.2. Export subsidies, 1950–2018 (percent of GDP).
Data for 1950–1964 are from Central Bureau of Statistics (1965, table 6.1). Data for 1965–2018 are from Bank of IsraeI (2019c, table 6.A.11(1), table 6.A.11(2)). In the overlapping years, 1960–1964, the two series are very similar.

Israel's Trade Policies

Figures 11.1 and 11.2 show that Israel fluctuated over the years between protectionism and openness to international trade. Protection increased in the 1950s, followed by opening in the 1960s, and then a rise in protection after 1967. Since the early 1980s, the country gradually reduced protection and opened up to international trade. The goals of the barriers to trade were not only to support domestic production (namely, "infant industries") but also to reduce the trade deficit. The tools of protectionism consisted not only of taxes on imports and export subsidies, but also quantitative restrictions, like import quotas, import permits, and standards. In the early years, the government also used a system of multiple exchange rates that differed for importers and exporters. These were implied taxes on imports and subsidies for exports, in addition to what figures 11.1 and 11.2 show.

Trade liberalization after 1962, interrupted only in the years of high conflict (1967–1980), included also entering new trade agreements. In 1962, Israel joined the General Agreement on Tariffs and Trade (GATT) and immediately began to reduce barriers to trade. In 1964, it signed the first agreement with the European Union (EU), then known as the Common European Market, which agreed to reduce tariffs and quantitative restrictions on imports from Israel for twenty industrial and agricultural products, mainly citrus fruits. In return, Israel agreed to reduce barriers on import of products from the Common Market to Israel.[18]

The first agreement with the EU, in 1964, was for 3 years only. In 1970, Israel signed a second agreement, this time for 5 years, which widened the set of products for both sides. In May 1975, Israel and the EU signed a free trade agreement without a time limit. It abolished all tariffs and quantitative restrictions on industrial Israeli exports to the EU from 1977 on. It also reduced tariffs on agricultural exports from Israel by half already in 1975. Israel committed to abolish gradually, until 1989, tariffs and quantitative restrictions on industrial imports from the EU. Israel also agreed to reduce tariffs on European agricultural products by 15 to 25 percent.

The trade agreement between Israel and the EU put pressure on American exporters to Israel, who faced increasing competition from European exporters. At the same time, international negotiations on global trade agreements (GATT) faced difficulties and almost stopped. The United States decided to launch a bilateral free trade agreement with Israel, hoping that it would help break the ice in the international negotiations. The two countries signed an agreement in April 1985, stipulating that both countries would gradually eliminate all tariffs and trade restrictions between them. It applied not only to industrial products but also to agricultural products and to services, which were not included in the agreement with Europe.

These trade agreements greatly improved Israel's export capacity, but also created a problem with imports. Due to the agreements, Israel imported more from rich countries with expensive products, and less from less-developed countries, whose cheap products became relatively expensive, due to tariffs and import quotas. This raised the cost of living in Israel in the 1980s. To overcome the problem, the government initiated a policy of unilateral opening to imports from third countries, namely, countries that did not have trade agreements with Israel. The new policy began in September 1991 with the removal of all quantitative restrictions on imports from these countries to Israel, replacing them with tariffs, up to a maximum of 75 percent. Then it reduced tariffs to a maximum of 8 percent on raw materials and 13 percent on final and intermediate goods. The implementation of this unilateral opening took some time, due to pressures from local producers, and full implementation was achieved in the early 2000s.

Interestingly, the unilateral opening policy accelerated the signing of another trade agreement in January 1993, with the European Free Trade Association. This is a West European

organization of nonmembers of the EU: Austria, Switzerland, Norway, Sweden, Finland, Iceland, and Liechtenstein. Since 1993, Austria, Sweden, and Finland have joined the EU, and today the European Free Trade Association consists of only four countries.

The description of Israel's trade policies is not complete without its trade relations with the Palestinian occupied territories. Until the Oslo Accords, Israel treated these territories as its own, and trade was free in the whole area. The economic annex to the Oslo Accords from 1994, known as the Paris Protocol, outlined a new trade regime between Israel and the Palestinian Authority. However, it was not much different from the previous status. It treated Israel and the territories as a single customs envelope, without trade barriers between the two authorities. Moreover, imports of products into the Palestinian Authority pass only through Israeli airports and seaports, where the tariffs and taxes on these imports are collected.

This situation had two important outcomes. First, Israel collects the taxes on imports and transfers the relevant share to the Palestinian Authority. This is a source of frequent tensions, when Israel delays transfers as a punishment or as a lever of pressure on issues unrelated to trade. Second, the Palestinians cannot import cheap products from Arab countries through Jordan, as these do not comply with Israeli standards, like milk powder. The Palestinian Authority has asked Israel several times to renegotiate the Paris Protocol. It claims that the fences and border crossings since 2005 between the West Bank and the Gaza Strip and Israel prevent massive smuggling and remove the need for the customs union.[19] It is very important for the Palestinians, who have a stagnant economy, with close to zero growth per capita since the Oslo Accords of 27 years ago.[20]

Trade liberalization in Israel had a significant effect on competition within Israel. Being a small economy, many industries have a high concentration of large companies. Therefore, the best way to promote competition is to introduce trade liberalization. Thus, even if the number of companies in an industry remains small, competition with companies from all over the world should lower domestic prices.

This indeed happened in the market for furniture and home appliances. Although the share of imports in this market did not rise by much, from 51 percent of the market in 1990 to 57 percent in 2010, prices in this market fell to half.[21] Trade liberalization affected clothing and footwear even more strongly. Prices of clothing went down by 60 percent and of footwear by 70 percent from 1990 to 2010. In clothing, the share of imports increased from 11 percent to 80 percent and in footwear from 21 percent to 80 percent. Thus, in both sectors, domestic production disappeared almost completely.

However, some markets reacted differently. Imports of food, beverages, and tobacco increased from 11 percent of consumption in 1990 to 20 percent in 2010, but prices increased by 15 percent. One explanation is that due to the high cost of importing fresh food, there are low imports of it. Another explanation for the rise in the price of food might be increased imports of luxury foods. The market for medicines and medical equipment presents another deviation from the expected, as imports increased from 34 percent in 1990 to 56 percent in 2010, while prices declined mildly, by only 20 percent.

Finally, the overall explanation for the periods of high intervention, as resulting from urgent national needs, does not fully explain the opposite policies when these urgent needs find their solutions, either by absorption of immigration or by a peace agreement. The data show that the policies Israel adopted then were privatization and trade liberalization. Was it due to the influence of economists in the public sector who pushed for such policies? Was it the influence

of businesspeople on politicians? Was it the influence of global political trends? As the final section in this chapter shows, it was all of the above and more.

Liberalizing Other Markets

Most of the above description of the dynamics of public involvement in the economy focused on public ownership and trade protection. This section broadens the picture and offers a brief discussion of public involvement through regulation in the three main markets: for goods and services, for labor, and for capital.[22]

Competition in goods and services increased significantly with trade liberalization, as described in the previous section. The government could also affect regulation in housing, communications, and transportation, as it allocates land, radio frequencies, and broadcasting rights. Here, the record is mixed, and the most progress was made in communications, probably due to much technical progress in this area. The government opened the markets for cellular phones, international calls, cable and satellite television, and television broadcasting. Allocation of frequencies remains highly regulated, for security reasons. In public transportation, new bus companies entered in addition to the old cooperatives, Egged and Dan, but the government keeps allocating lines between the companies, so competition is limited. In housing, the government still controls most of the land, mainly to reserve it for the Jews as much as possible. In 2015, the government decided to keep the newly discovered natural gas under control of one main producer. The head of the Anti-Trust Authority, David Gilo, resigned in protest.

There has been less deregulation in the labor market, partly because it has had little regulation in the past. The main development in this market was the weakening of the national labor union, the Histadrut. The government contributed to this weakening in two main moves, both implemented by the Labor government of Rabin. The first was the introduction of the National Health Care Reform, which disconnected the largest health fund in Israel from the Histadrut. The second move was the reform of pension funds in 1995, when the government took control of the Histadrut pension funds. Both moves reduced membership in the Histadrut, as previously, many had become members mostly for access to its health insurance and pension funds.

The deepest involvement of the Israeli government was in capital markets. One main reason was the control by the government of most of the inflow of funds into the country, due to the West German reparations, Zionist donations, and American aid. The government used these funds to develop the economy, which it did either directly or indirectly, using the banks as pipelines. In such lending, called “directed credit,” the banks did not monitor the loans carefully, as they received government guarantees for them. This laxity resulted in a severe distortion. In addition, the government channeled the funds mainly through the main public banks, which increased their relative share and further reduced competition in the sector.

After 1967, the public debt grew rapidly, due to the fiscal crisis. To ensure demand for the bonds it issued, the government severely restricted institutional investors, like pension funds, provident funds, and training funds to holding a portfolio that consisted primarily of government bonds. To encourage their purchase, the government also offered tax exemptions on such bonds. Furthermore, it offered the institutional investors special “designated” bonds. These were nontradable bonds with a higher rate of return than the market. For example, pension funds could buy indexed bonds with real annual interest rate of 5.2 percent per year. Such subsidies created distortions as well. A third type of intervention was by restricting the holding of foreign currency

by Israelis, as the government was worried about reductions in its reserves of foreign currency.

Since the late 1980s, the government has gradually reduced its involvement in the capital markets. This reform became possible due to the reduction of public debt, following the peace with Egypt. An important element of this reform was the reduction of supply of designated government bonds for pension funds and a complete cancellation of such bonds for provident funds. As a result, these institutional investors entered financial markets of stocks and corporate bonds. The reform contributed to these markets significantly, but it increased the volatility of returns of institutional investors.

In 1995, the government implemented a major reform of pension funds. It closed the existing funds, which already had large actuarial deficits, to new members. The government secured most rights of previous members of these funds. New entrants to the labor market had to enter new pension funds, with defined contributions. The new pension funds were competitive, actuarially balanced, and received smaller subsidies from the government than the old funds did. Instead of 93 percent of assets held in designated bonds, as for the old pension funds, the new funds could hold only 70 percent in such bonds, which paid a lower real return, 4.8 percent instead of 5.2 percent. The government also moved new public sector workers from a "pay as you go" pension to the new pension funds.

In 2003, the government deepened the reform of pension funds. It stopped issuing the old designated bonds to the old funds, leaving them only with the new ones, which yield only 4.8 percent. The government also reduced the share of designated bonds to 30 percent for both old and new funds, forcing them to invest the remaining 70 percent in financial markets. The government has also extended the working period from age 65 to 67 for men, and from 60 to 62 for women. These changes worsened the conditions of pension saving, in addition to the decline in global yield rates after the financial crisis of 2007–2008. In 2008, the government passed a law of obligatory pensions, so that every worker must have a pension fund.

In the area of credit, the government ended all its involvement, and it does not channel credit to businesses any longer. It also gradually shifted its support to investors from direct subsidies to reductions in corporate tax. The government liberalized international capital flows significantly. Companies can now borrow unlimited amounts abroad and can issue shares abroad as well. Israelis can buy assets abroad as well. This liberalization reduced the interest rate gaps between Israel and the global markets, as shown by Bufman and Leiderman (1996).

The Israeli commercial banks used to control many activities in capital markets, and as a result, they dominated financial intermediation in the country. One of the big efforts in liberalization of capital markets was the attempt to reduce this control. As described in chapter 10, the government reduced banks' holdings of large companies in the early 1990s, and it removed provident and investment funds from the banks in the 2000s. In 2018, the government adopted the recommendations of the Strum Committee that banks should sell their credit card companies. One justification for these decisions was to reduce the monopolistic power of commercial banks, assuming that this power is a result of their domination of financial intermediation. However, this intention was not realized, as the banking sector is still not competitive, and the two big banks, Leumi and Hapoalim, still dominate it, as chapter 10 shows.

The Tragedy of the Labor Movement

This chapter shows that the labor movement did not always increase public intervention when in

power. It did so only when Israel faced urgent national challenges, like the absorption of large numbers of immigrants and intense eruptions of the Israeli-Arab conflict. Once Israel overcame these challenges, it liberalized markets and reduced interventions. It did so already in the early 1960s, and much more so after 1980, in 1984–1988, in 1992–1996, and in 1999–2010. This clearly shows that the labor movement did not really push toward "socialism in our times," as Golda Meir declared in the early 1950s. Actually, the movement built a capitalistic economy in the country. How can we explain this long-run policy of the labor movement?

One explanation is that the labor movement was never socialist. As Sternhell (1998) argues, it only adopted socialist ideas to serve the national Zionist goals. Thus, it built kibbutzim mainly because it was a successful way to settle the land. Ben-Porat (2011) holds a similar view. I offer a more nuanced explanation and claim that the labor movement deviated from social democracy not because of hypocrisy but because it faced unique conditions that required it to change policy substantially.

The Social Democratic parties in Europe developed in well-functioning economies, with a large labor force that is employed in many companies across the country. Hence, to care for the interests of these workers, these parties supported the workers' struggles for higher wages, shorter work hours and better public services. The early Israeli labor movement operated under very different conditions. Its constituency was not workers in workplaces, but a constant stream of new immigrants. Their main need was not protection on the job, as in Europe, but obtaining a job. As a result, the labor movement focused on creating jobs for the new immigrants.

Hence, the Israeli labor movement walked a very different path from classic Social Democratic parties. First, it built companies and became a large employer. Second, it fought against Arab workers, to keep jobs for Jewish immigrants. Third, it encouraged private investments to create more jobs, which required lowering its socialist profile. These policies increased the gap between the labor movement and its social-democrat roots, but such policies were necessary for its constituency, the growing Jewish working class that kept immigrating to the country. This explains the strong support for the labor movement in the fast-growing society.[23]

In addition to caring for its constituency, the labor movement also emerged as the leader of the Zionist movement, which affected its policies as well. Early on, it realized the need to hold this leadership position. Workers were the majority of the new Yishuv, and to care for them well, the labor movement had to lead the national movement. This explains why, from early on and especially under the leadership of David Ben-Gurion, the labor movement gave high priority to the national goals. It understood that it could not have two revolutions at the same time, national and social, and focused on the national.

However, this strategy of the labor movement, which made perfect sense earlier, led later to its imminent decline and demise. When the Israeli economy stabilized, in the 1960s, the interests of workers changed. They already had jobs and housing, and they no longer needed so much from the party that built the country. Instead, they needed a Social Democratic party that would care for their interests in the workplace. Tragically, the labor movement could not perform this task. It was already far removed from social democracy and could not change itself. It had become a movement of managers and functionaries of the young state, alienated from the new working class. The new ethnic divide worsened this alienation. While the labor movement consisted mainly of East Europeans, the current workers were mainly new immigrants from Arab countries.

The tension showed up in repeated conflicts between the labor leadership and the new workers. Demonstrations and clashes between immigrants from Arab countries and the establishment broke out already in 1957 in the neighborhood "Wadi Salib" in Haifa. The early 1960s saw labor unrest among workers at large factories in the Tel Aviv area, which led to direct conflicts with the Histadrut.[24] In the early 1970s, a group of young people from the poor neighborhoods of Jerusalem formed the Israeli "Black Panthers," and for more than a year, they ignited huge protests and demonstrations. The gap between the Labor Party and actual workers kept deepening, until the Likud won the election in 1977.

The growing gap between the socialist rhetoric of the labor movement and its actual policies led not only to alienation of the new workers but also to tensions within the movement itself. The labor movement promoted to senior positions those executives who were capable of managing economic enterprises. Many came from the military and defense circles, such as Moshe Dayan, Shimon Peres, Yitzhak Rabin, and Ehud Barak. These leaders did not take the socialist rhetoric seriously and fully identified with the need to promote a market economy. An example of this cynical attitude was the statement by Shimon Peres, during the 1964 election campaign, that in his view, "socialism means a car for every worker." The path from holding such opinions to adopting a neoliberal ideology was very short. However, if the labor movement did not represent workers and did not adhere to social democratic ideas, then centrist parties could easily replace it. And indeed they did, leading to the final collapse of labor in the 2020 elections.

1. Of the three main parties in the labor movement, only the most leftist one, Mapam, defined itself as Marxist and supported for a short period the Soviet Union (mainly after the role of the Soviet Union in defeating Nazism and after its support for the establishment of Israel in 1948–1949). However, later Mapam experienced similar shifts to the right, as did the rest of the labor movement.

2. Sternhell (1998) also focuses on the Mandatory period, while this chapter deals with the years of statehood.

3. Aharoni (1976), p. 373.

4. As the next section shows, this projection was quite wrong.

5. As mentioned above, many share the view that the labor movement built a socialist economy in Israel in the early years. However, some economists disagree with this view. Razin and Sadka (1993, pp. 5–6) call it a "myth," which also attests to the spread of this view. They add (p. 2): "the government aggressively searched for private entrepreneurs and investors and heavily subsidized them. In this respect, the economic system was far from a socialist command economy."

6. See Morris (1993), chapter 2.

7. Aharoni (1976), p. 126.

8. Aharoni (1976), p. 124.

9. See Bialer (1999) and Aharoni (1976), p. 123.

10. See Ben-Porat (2011), p. 131.

11. The changes among the sectors in 1966–1967 reflected only the recession but not yet a change in policy.

12. Ending the Lavi project was a result of US pressure as well.

13. In some areas, new technological developments reduced such monopoly power. The main example is communications, where cellular phones reduced the importance of the telephone line system.

14. The Histadrut also privatized many companies, but there is less documentation on this process.

15. The data on privatizations are from Government Companies Authority (2000, 2006), and Government Companies Authorities (2019), appendix C.

16. For example, Israel levies a high tax on cars. Since Israel does not produce vehicles and all cars are imported, this is a tax on imports as well.

17. The trend reversal coincides with Israel's joining the General Agreement on Tariffs and Trade in 1962; see the next section.

18. The description of the trade agreements and trade policy in this section relies on Sharon (1993).

19. See Arnon et al. (2015) for a proposal to update the Paris Protocol by a group of Israeli and Palestinian economists.

20. See Finkelstein et al. (2015).

21. The data on shares of imports and prices were supplied by the Israeli Central Bureau of Statistics.

22. Ben-Bassat (2002a) and Gronau (2002) contain detailed descriptions of deregulation in Israel.

23. There are claims that the labor movement manipulated support in the early years by controlling institutions, like health fund and labor bureaus. Other observers blamed it for corruption. However, such claims do not fit many facts, like the fluctuations in election results, and the small number of corruption cases, despite public accusations at the time.

24. See Lev Greenberg (1993).

12

The Public Sector since 1985

The Measure of Public Expenditures

The tension that governments face, between intervention and free markets, appears in a number of areas. Chapter 11 explores three such issues: public ownership of production, openness to trade (also known as globalization), and regulation. Chapter 13 focuses on interventions in labor markets. The present chapter examines the main intervention of governments, which is the public supply of goods and services, also called "fiscal policy."[1] Chapter 5 analyzes fiscal policy during the period of the great crisis in 1967–1985, when the Israeli-Arab conflict intensified. The present chapter focuses on what happened after the stabilization of 1985, when the government recovered from the crisis and formed a more long-run fiscal policy.

The main variable that measures fiscal policy in this chapter is total public expenditures as a percentage of GDP. Of course, fiscal policy consists not only of expenditures but also of income, but since the government has kept its deficit low after 1985, the dynamics of expenditures and income have followed one another quite closely. As mentioned in chapter 5, after the peace agreement of 1979 with Egypt and its implementation, the share of public expenditures in GDP fell significantly. This decline was a result of ending the phase of the wide conflict, between Israeli and the Arab conventional armies. As explained in chapter 5, this led to a decline in defense costs, a decline of support to the business sector (because fewer men did reserve service), a decline in interest payments (as the large deficit closed), and a decline in transfer payments (mainly by reducing sharply subsidies to basic goods, due to the end of high inflation).

The decline of these expenditures freed many resources. The government now faced a serious decision of where to direct these resources. One possibility was to transfer these resources to other social services, like education, health, housing, public transportation, and welfare. An opposite possibility was to use these resources to reduce taxes. The government could choose any combination of these two extreme policies, by dividing these resources between lower taxation and increased social services. This chapter examines the decisions made on these issues by the various Israeli governments since 1985, what was behind the decisions, and how they affected the economy.

The Global Rise of Public Sectors in the Twentieth Century

To understand fiscal policy in Israel, it is important to put it in the wider context of fiscal policy in the advanced economies, to which Israel belongs. The most salient feature in these countries has been the significant rise of the public sector since the Industrial Revolution and especially during the twentieth century. The famous economic historian Angus Maddison collected data on

the size of the public sectors in the countries that led economic growth: the United Kingdom, the United States, Germany, France, the Netherlands, and Japan.[2] Public expenditures in these countries increased from an average of 12 percent of GDP in 1913 to an average of 42 percent of GDP in 1999.[3] In fact, public sector growth was greater, since in 1913 three of these countries, Germany, Japan, and the United Kingdom, had relatively high military and naval expenses. In the other countries, public spending was only 8 percent of GDP on the eve of World War I. Hence, public spending in these countries increased by more than five times. This increase, also known as the rise of the "modern welfare state," has various explanations, like the expansion of democracy in Western countries and the rise of the modern nation-state. This section focuses on the economic explanation.[4]

Throughout most of human history, governments have primarily produced what economists call "public goods," such as security, law and order, roads, and scientific research. These are goods whose use cannot be restricted once they are produced. Hence, there cannot be a market for such goods. For example, people will avoid purchasing security if there is an army that provides security to the entire kingdom anyway. Hence, a market for security cannot operate. Economists say that public goods are nonexcludable and nonrivalrous.

However, the expansion of public expenditures in the twentieth century was not of public goods, but rather of other goods and services, which are essentially private. These are mainly education, health, welfare, housing, and public transportation. Governments began to finance such private products because of significant market failures, where private production and use was not optimal. Economists use the term "market failure" for a situation in which the conditions for perfect competition do not hold. These conditions for perfect competition are: many sellers and buyers, homogenous goods, full information to all, and free mobility between buyers and sellers.

Already in 1776, Adam Smith pointed out the importance of perfect competition for efficient economic allocation in his well-known book *The Wealth of Nations*.[5] In groundbreaking research, Arrow (1951) and Arrow and Debreu (1954) have formally shown that perfect competition should lead the economy to an equilibrium, and that this equilibrium is Pareto optimal, or Pareto efficient. This optimality means that it is impossible to improve the welfare of one person without reducing the welfare of another person. More simply put, there is no waste in such an equilibrium. However, the first welfare theorem implies that if a market strongly violates the conditions of perfect competition (namely, if there is a severe market failure), then the allocation is not Pareto optimal and there is room for government intervention.

However, the increase in government support to education, health, welfare, housing, and public transportation was not only due to market failures in private provision of these goods. It was also due to growing demand for these services because of modern economic growth.

Education: Throughout history, most children, growing up on farms, acquired their human capital (namely, their professional knowledge) from their parents. Some were trained by professionals as apprentices. Very few acquired general education, as a training for a career in administration, clergy, or medicine. However, since the Industrial Revolution technologies changed frequently, which made it impossible to receive proper training from one's parents or from adult artisans. In the age of technical change and mass production, all workers need some general education, to enable them to read instructions on the operation of new machines, read and write invoices, and prepare deliveries. Such activities require literacy, arithmetic, and some basic science. Hence, modern economic growth required that all children receive a general

education.

However, early childhood education is an investment that pays back much later in life. Wealthy families could easily finance such investment, but poor families needed loans, which were usually unavailable to them, due to what economists call “capital market imperfections.” Hence, many poor families could not invest in education of their children.[6] This market failure had a significant effect on education attainment before the expansion of public education. In 1870, the share in population (ages 15–64) without any education was 78 percent in France, 65 percent in Germany, 72 percent in Italy, 95 percent in Russia, and 78 percent in the United Kingdom.[7]

This market failure on one hand, and the growing demand for education after the Industrial Revolution on the other hand, explain why public education began in the nineteenth century and has expanded so much since then. It began with primary education, and later secondary education and tertiary education after World War II. Public support for education in OECD countries now reaches 80 percent of total education costs.

Health: When a person gets sick, he might infect others. If a person has good health care, she contributes to the welfare of others by reducing their chance of infection. Hence, health care has what economists call a positive “externality.” This is a significant market failure, which justifies subsidization of health care, to “internalize” the externality and to reach optimal health levels. However, public support for health began late historically, in the twentieth century. This also was due to modern economic growth and the urbanization it causes, since larger cities face higher risks of spreading diseases. This increased the need for public health care.[8]

Welfare: Welfare is insurance against poverty, namely, against failure in the labor market. Thus, it is a private service as well. It suffers from a market failure caused by asymmetric information between the insured and the insurer. Since people who are prone to being poor (or their parents) know their risk of poverty better than the insurer does, a sufficiently large number of such individuals might buy such insurance in big numbers, so it might not be actuarially balanced, and the insurance would collapse. This is why we do not see private insurance being offered to protect against poverty in reality. Arrow (1963) was the first to identify such a failure in insurance markets and termed it “adverse selection.” Interestingly, governments can overcome such market failure easily, as they can supply this insurance to all.

Indeed, governments began to supply such insurance, through income support to the poor, unemployment insurance, and other programs. Such support systems began in the nineteenth century and expanded in the twentieth century, with the US Social Security and institutes in other countries that followed it. Here too, the pressures of economic growth played a role. First, frequent technological changes increase job losses. Second, urbanization broke down extended families, which used to supply insurance against poverty in the past, through mutual aid within the extended family. When this mechanism weakened, the need for an alternative increased.

Housing: Purchasing a home in the private market also faces a market failure, especially for the poor, due to indivisibility. A home has a minimal size, as it needs a toilet, a place for a bed, a kitchen, water connection, electricity, sewage disposal, and so forth. Hence, poor people might find it hard to pay for housing. This problem also became acute due to urbanization, since in modern cities, each home has to satisfy some minimum infrastructure. This explains why governments in many countries subsidize housing for the very poor.

Public transportation: Public transportation operated for thousands of years, mainly by carriages or convoys. It was usually a private good, without support from governments, except

for building roads and bridges. In modern times, governments subsidize public transportation significantly. Again, it is due to both economic growth and market failures. Modern technology revolutionized transportation through the development of trains, buses, and planes. In addition, transportation has two important externalities: congestion and air pollution. The latter has become acute in times of a climate crisis due to global warming. Governments support or even supply public transportation, as it reduces both congestion and pollution relative to private transportation.

The rise of public sectors during the twentieth century was indeed impressive. In 2016, the average size of public expenditures in OECD countries was 41.8 percent of GDP. However, as figure 12.1 shows, public sectors vary in size from less than 30 percent of GDP to more than 50 percent of GDP. Thus, although all countries supplied minimum levels of public services to reduce market failures and make the modern economy function, some countries supplied more. This is due to an additional motive to increase the public sector: to lower inequality. Education, health, welfare, housing, and public transportation benefit mainly lower-income households. Hence, the differences in public sectors, shown in figure 12.1, reflect differences in attitude toward inequality. This reflects the weakness of the criterion of Pareto optimality, which is indifferent to high inequality. Hence, many governments support greater public intervention to reduce inequality, even if such intervention might not be fully Pareto efficient.

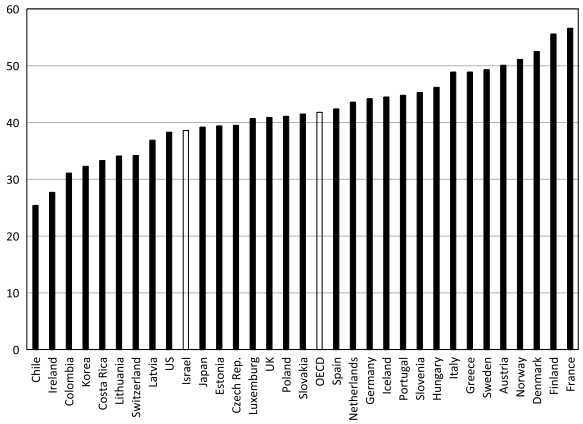

FIGURE 12.1. Public expenditure in OECD countries, 2016 (percent of GDP).
Data are from OECD (2019b, table 2.27).

Where is Israel in this international comparison? In 1960, public spending in Israel was 28 percent of GDP, lower than the average in the developed countries by 4 percent of GDP. In 2016, public spending in Israel was 38.6 percent of GDP, lower by 3.2 percent from the OECD average. Therefore the long-run rise in Israel's public spending has been largely in line with that of the most developed countries, though it is 3–4 percent of GDP lower. Since defense spending in Israel is higher than in other OECD countries by more than 4 percent of GDP, the supply of social services in Israel is 7–8 percent of GDP lower. This places Israel near the bottom of the OECD in terms of the amount and quality of social services it provides to its residents.[9]

The Decline of Public Spending since 1980

Chapter 5 shows that after the peace agreement of 1979 with Egypt, Israeli defense-related

expenditures, which increased sharply after 1967, began to fall. Direct defense spending and support to the business sector declined, and after the stabilization of 1985, interest payments declined as well, due to the reduction of deficit and debt. The decline of these costs enabled not only the implementation of the stabilization plan but also the gradual reduction of public expenditures relative to GDP. This raises the question what happened to the resources that were freed up by this reduction of costs.

Table 12.1 presents various public expenditures after 1980 as percentages of GDP. The first row is total public expenditures minus defense, interest payments, and support to business, called here "residual expenditures." The other rows present specific expenditures on public education, welfare subsidies, public health, public housing, public investment, and public administration. In addition, there are some minor expenditures, which are not included in table 12.1, so the partial expenditures sum up to slightly less than the residual expenditures.

Table 12.1 shows that the residual expenditures increased from around 28 percent of GDP in 1980 to around 30 percent in 2018. However, the National Health Insurance Law of 1995 introduced a new health tax, which had been a private payment earlier, as explained below. This tax was of an average size of 1.5–2 percent of GDP. Thus, the overall conclusion is that residual expenditures remained the same throughout the period. Thus the resources freed by the peace agreement with Egypt did not go to other social services but went completely to tax reduction.

The specific expenditures did not change much either. Expenditures on public education declined until the early 1990s, increased during the Rabin government to 7.6 percent of GDP in 1995, and later declined again to around 7 percent of GDP. Investment remained quite stable over the entire period, at around 2.5 percent of GDP. Expenditures on administrative services, which include law and order, increased slightly over the years, by 0.5 percent of GDP.

TABLE 12.1. Various public expenditures, in selected years, 1980–2018 (percent of GDP)

Year	1980	1985	1990	1995	2000	2005	2010	2015	2018
Residual expenditures	27.7	27.7	30.1	32.4	30.1	29.1	28.9	28.6	30.3
Education	7.56	7.12	6.71	7.60	7.04	6.51	6.63	6.79	7.00
Welfare transfers	9.81	8.15	8.90	9.10	9.34	8.77	9.03	8.41	8.82
Health	4.56	3.89	3.60	5.21	5.02	5.14	5.04	5.09	5.37
Housing	1.85	1.52	2.33	0.98	0.70	0.77	0.40	0.52	0.81
Investment	2.51	1.76	2.67	3.79	2.69	2.15	1.96	2.05	2.55
Administrative	3.35	3.43	3.38	4.22	3.89	3.91	3.70	3.59	3.90

Source: Data are from Bank of Israel (2019c, tables 6.A.2, 6.A.5, 6.A.8, and 6.A.11(2)).

One expenditure that declined significantly was public housing. It increased significantly during the early 1990s, when the large immigration wave arrived, and reached a high level of 2.3 percent of GDP in 1990. However, it then declined steadily and reached a low of 0.4 percent of GDP in 2010. This trend is a result of the government policy to stop building new projects of public housing. The decline caused long waiting lines for public housing for poor families, and in general, it contributed to a rise in housing prices. It is not surprising that the social protests of 2011 focused on high housing prices. Only in 2016–2018 did Finance Minister Moshe Kahlon increase subsidies to construction, which reduced housing market shortages.

Welfare transfers also remained quite stable over the years. The year 1980 was an outlier, as transfers still included subsidies to basic foods, but this item moved in 1981 to be part of the

support to the business sector. Welfare transfers amounted to around 9 percent of GDP most of the period, except for the years 1991–1992, when they increased to more than 10 percent of GDP, due to the large immigration, and in 2001–2002, when child subsidies increased significantly, but they were reduced again in 2003. However, although aggregate transfers remained stable over time, some of them changed significantly. The main item that increased over the years is nursing, due to greater longevity. Nursing costs were 0.01 percent of GDP in 1980, 0.26 percent of GDP in 1995, and 0.55 percent of GDP in 2018. Transfers to disabled individuals also increased, from 0.87 percent of GDP in 1980 to 1.19 percent in 1995, to 1.56 percent of GDP in 2018.[10] However, the reforms in 2003 significantly reduced other subsidies, mainly income supplements, which declined from 0.53 percent of GDP in 2000 to 0.15 percent in 2018. Support to children declined from 1.4 percent of GDP in 1999 to 0.61 percent in 2018.

Before turning to the dynamics of expenditures on public health, it is worthwhile to describe the structure of the health system in Israel. Such a description is useful as it presents an interesting example of a public health system that is competitive and operates very well. In these days of intense debates on public health in the United States, this example can be illuminating. As for any other issue, history matters. The origins of the current Israeli system are in the General Health Fund ("Kupat Holim Klalit") established by workers in 1911. It then became part of the labor union Histadrut in 1921. It was a health organization, which operated through local clinics, where worker members of the Histadrut could receive treatment from doctors, nurses, laboratories, and pharmacies. Since 1924, the General Health Fund also built and operated hospitals. The General Health Fund served people related to the labor movement, and soon other political movements followed with their own health funds: "Maccabi" and "Meuhedet" by the General Zionists, and "Leumit" by the Revisionists. However, Klalit remained the largest fund, with the majority of clients.

After 1948, the new state of Israel did not change this system much, except for building government hospitals, some based on previous Mandatory hospitals and many new. However, the financial weakening of the Histadrut in the 1980s led the Rabin government to overhaul the system and to pass the National Health Insurance Law in 1995.[11] The law made all health funds independent and transformed them into nonprofit organizations. The main source of finance for the health funds is a health tax, collected by the National Insurance Institute and passed to the health funds according to their membership. The government also transfers additional resources to the health funds, to enable them to supply a basic health basket.[12] The health funds continue to serve their members in clinics, with doctors, nurses, laboratories, and pharmacies, but the law also sets uniform hospitalization fees for the health funds in the various types of hospitals: governmental, General Health Fund, or public hospitals. People can move freely from one health fund to another once a year. The health funds also offer additional health insurance beyond the basic health basket.

The health expenditures shown in table 12.1 are actually the sum of the health tax and of the additional transfers from the government to the health funds. Hence, the comparison should begin in 1995, because in earlier years, people paid the health funds directly and not through the government. Table 12.1 shows that public expenditures on health have remained stable since 1995 at around 5.2 percent of GDP. Revenues from the health tax are quite stable as well, at 1.8 percent of GDP.[13] Hence, additional support from the government to the health funds is around 3.4 percent of GDP. Note that in 2018, total health expenditures in Israel were 7.6 percent of GDP. Hence, private spending on health is around 2.5 percent of GDP, which is one-third of total

spending.

The Decline of the Public Sector: The Policy and the Rule

The previous section shows that the government did not use the decline in conflict-related expenditures to increase other public services. It kept public expenditures on other services unchanged, except for the introduction of the Health Tax in 1995, which raised public expenditures by around 1.5 percent of GDP, while previously people paid a similar fee directly to their health care providers.

However, even though expenditures on these public services did not change relative to GDP, they suffered an actual erosion. The reason is that most of these expenditures had to increase relative to GDP, due to structural changes in Israel, to keep the same public commitment to these services. The demand for education increased, as more students acquired more years of schooling.[14] The demand for health care increased as well. This was partly due to aging, as the 65+ age group increased from 8.6 percent of the population in 1980 to 11.7 percent in 2018, which is a relative rise of one-third.[15] In addition, the advancements in medical technology required some increase in health expenditures, due to new medications, equipment, and procedures. The rise in the population density in the country also put pressure on transportation and other systems and required an increase in spending on infrastructure, public transportation, and housing. Instead, these expenditures remained stable.

Hence, the overall decline of public expenditures after 1980 was not only an incidental result of the peace with Egypt that reduced defense-related costs. It was also a persistent policy to reduce the public sector, as the decline kept other expenditures constant relative to GDP, despite the growing needs in education, health, and other services. All the resources freed by the peace with Egypt went to reducing taxes, as shown in the next section. Therefore, the reduction of both total public expenditures and taxes relative to GDP, as shown in figure 5.3 in chapter 5, was a clearly intentional policy adopted by all the governments from 1980 on. As it was a consistent and continuous policy, it implies that all governments in office from 1980 to 2018 shared it. These were 17 years of Likud governments, 6 years of Labor governments, and 16 years of governments with Labor and Likud or another center party.

I reach the conclusion that this was a consistent policy not only from observing the policy ex post, but also from the fact that since 2004, there is a law, called the “expenditure rule,” which supports this policy. Benjamin Netanyahu was the first to set this rule, when he served as minister of finance in the government of Ariel Sharon. The expenditure rule sets a cap on the annual growth rate of real public expenditures. Although the rule has changed several times since 2004, in all its forms, it sets a growth rate for public expenditures that was lower than the rate of GDP growth. Thus, the rule actually prescribes that public expenditure relative to GDP should decline over time.

The first spending rule of 2004 limited the real rate of growth of public spending to 1 percent at most. Obviously, this is much lower than the annual rate of GDP growth in Israel, which is 3.5 percent on average. In 2006, the rule changed to 1.7 percent, which was the average annual rate of growth of population at the time. It was still much lower than the rate of GDP growth. In 2011, the rule changed again, this time to a more complex formula. It set the rate of growth of public expenditures to be the average growth rate in the past decade, times a “restraint coefficient.” This coefficient is the ratio of the public debt target and the actual public debt. At

the time, the target was 60 percent of GDP, while the actual debt was 70 percent of GDP. Hence, the rule allowed expenditures to rise by 3 percent, still less than the growth rate of GDP.

In 2014, the government again changed the expenditure rule to another complicated formula. It set the growth rate of expenditures to be the sum of the average rate of growth of population in the past 3 years and the "restraint coefficient." On this occasion, the government also reduced the target for public debt from 60 to 50 percent of GDP. According to this rule, the growth rate of public expenditures should be smaller than the rate of population growth plus 1. Since the average rate of population growth has been 1.9 percent recently, public spending should rise by less than 2.9 percent, again less than the growth rate of GDP.

Hence, the expenditure rule, in all its incarnations, determines by law that public expenditures should decline relative to GDP. This makes the policy of reduction of the public sector explicit and formal. So far, the Ministry of Finance has adhered strictly to the rule, as it has good control over expenditures. Only during exceptional defense events, such as the 2006 Second Lebanon War, or during the current coronavirus crisis, have expenditures surpassed the rule temporarily. To maintain formal adherence to the rule, the ministry allocates such spending to special "budget boxes." The Ministry of Finance controls spending both through its powerful Budget Division and through the accountants of all ministries, who authorize payments, as they are subject to the General Accountant in the Ministry of Finance and not to their individual ministries.

Interestingly, the expenditure rule has a misleading effect on public opinion, as it conditions the rate of growth of spending on the ratio between the target debt and the actual debt. This gives the impression that the only way to reduce the debt is by reducing spending. However, public debt depends on the deficit, and the government can reduce the deficit not only by reducing expenditures but also by raising taxes. Indeed, we next show that the tax policy has counteracted the need to reduce the public debt over time.

The Reduction of Taxes

Table 12.2 presents the main components of public income and how they changed from 1980 to 2018. These are taxes; property income, which is mainly profits from government companies; intergovernmental transfers, mainly from the United States; donations from world Jewry, mainly to the Zionist organizations, universities, and hospitals; and finally other income, which includes fees, fines, depreciation, interest income from abroad, and other sources.

Table 12.2 shows that public income and all its components have declined significantly since 1980. While total public income declined by 23 percent of GDP, taxes declined by only 10 percent of GDP. Other components declined by much more. Property income declined due to privatization of many companies. Aid from the United States was quite stable over the years in nominal terms, between $2 billion and $3.8 billion, but it declined sharply relative to GDP, due to output growth in Israel, from 7.7 percent of GDP in 1980 to less than 1 percent in 2018. In general, nontax income amounted to 19.6 percent of GDP in 1980, which was a third of total public income. In 2018, it was 5.8 percent of GDP, only one-sixth of total public income. Hence, over the years, taxes became a larger part of public income.

TABLE 12.2. Components of public income, 1980 and 2018 (percent of GDP)

Public income	Total	Taxes	Property income	Transfers	Donations	Other
1980	59.0	39.8	4.7	7.7	2.1	9.8

2018	35.9	29.7	0.5	0.8	0.3	4.1

Source: Data are from Bank of Israel (2019c, table 6.A.1 (2)).

Table 12.3 draws a more detailed picture of the revenues from various taxes and how they changed over time, in percentage of GDP. It divides total taxes into direct and indirect taxes. It then divides direct taxes into income tax and to social security payments (to the National Insurance Institute). It also reports the corporate tax, which is part of income tax. The table divides indirect taxes into domestic purchase taxes (mainly value-added tax, VAT), and import taxes. It also reports on VAT receipts.

Table 12.3 confirms my conclusion above that the tax burden in Israel declined from around 40 percent of GDP in 1980 to around 30 percent of GDP in 2018. Both direct and indirect taxes declined, but direct taxes went down by around 7 percent of GDP, while indirect taxes declined by only 3 percent of GDP. The main decline in direct taxes was in income tax, which went down by almost 6 percent of GDP.

There were two main reductions in income tax rates. In 1988–1989, Minister of Finance Moshe Nissim appointed a committee headed by Eytan Sheshinski, which lowered income tax rates. As a result, tax revenues fell by 2.5 percent of GDP, as table 12.3 shows. During the 2000s, a committee headed by Yair Rabinovich and later another committee headed by Meir Hafuta together led to a reduction of income tax rates in 2007–2008. As a result, income tax revenues fell by 2.5 percent of GDP. The fact that these two reductions in tax rates reduced tax revenues as well, demonstrates that Israel is far from the peak in the famous Laffer curve. Note, that corporate tax did not change much over the years and its revenues were around 3 percent of GDP.

TABLE 12.3. Revenues from various taxes, selected years (percent of GDP)

Year	1980	1985	1990	1995	2000	2005	2010	2015	2018
Total taxes	39.8	41.0	35.8	34.2	33.7	32.4	29.4	29.7	29.7
Direct taxes	22.3	20.5	16.9	17.4	18.9	16.8	14.1	14.8	15.3
Income tax	15.9	14.6	12.0	12.4	13.8	11.4	9.0	9.7	10.2
Corporate tax	3.1	2.3	1.3	2.8	3.3	3.4	2.6	3.0	3.2
National Insurance Institute	6.4	5.9	4.9	5.0	5.1	5.4	5.2	5.1	5.2
Indirect taxes	17.5	20.5	18.9	16.8	14.8	15.5	15.2	14.9	14.3
Domestic	11.2	12.3	13.2	11.7	10.5	11.3	11.2	11.3	11.1
VAT	4.6	6.5	7.2	6.9	6.2	6.6	6.6	7.0	7.0
Taxes on imports	6.3	8.1	5.7	5.1	4.3	4.0	4.0	3.6	3.3

Source: Data are from Bank of Israel (2019c, tables 6.A.11 (2), 6.A.15, and 6.A.16).

The other component of direct taxes, collected by the National Insurance Institute (NII), which is similar to US Social Security, declined by 1 percent of GDP, according to table 12.3. However, the actual decline was larger. In 1995, the NII began to collect the health tax, which was 1.5 percent of GDP at that year, but later stabilized at 1.8 percent of GDP. Despite this new tax, revenues of NII were the same in 1990 and 1995, which shows that these revenues declined by some 1.5 percent of GDP in those years. Indeed, in the early 1990s, years of mass immigration and high unemployment, the government reduced that part of NII tax paid by employers, to stimulate hiring of new immigrants. Since then, the government never fully

reversed this reduction, which is why actual NII revenues, without the health tax, declined from 4.9 percent of GDP in 1990 to 3.6 percent of GDP in 2018. This raised severe worries for the financial future of the NII, as studied by a special government committee.[16]

Indirect taxes declined as well, mainly due to reductions in taxes on imports. This was part of trade liberalization in Israel after 1980, discussed in chapter 11. As shown in table 12.3, total domestic indirect taxes were quite stable around 11 percent of GDP. The government increased VAT significantly during the stabilization in July 1985, but afterward it remained quite stable, and its revenues were around 7 percent of GDP, despite some fluctuations in the VAT rate.

The large decline of direct taxes relative to the mild decline of indirect taxes made the Israeli tax system more regressive over the years. It is now quite regressive in comparison to other countries. As table 12.3 shows, the revenues of direct and indirect taxes are almost equal in Israel. However, in the OECD countries, revenues from direct taxes are more than twice as large as indirect taxes. A weighted average (weighted by GDP) of direct taxes in OECD was 22.2 percent of GDP in 2015. The weighted average of indirect taxes was 9 percent of GDP.[17] Clearly, Israel has a strong bias toward indirect taxes, and therefore its tax system is much more regressive than that of most OECD countries. We return to this issue in chapter 13.

More on the Public Sector

STRUCTURE OF THE PUBLIC SECTOR

The Israeli public sector consists of the central government and other institutions. The latter are local governments (municipalities for cities and towns, and regional authorities for rural areas); the National Insurance Institute; public nonprofit institutes (hospitals, health funds, universities, and colleges); and the National Institutes (the Jewish Agency, the Jewish National Fund, and other Zionist institutions), which are unique to Israel.

Table 12.4 examines the division of public expenditures among these institutions and the transfer of funds between them, all measured in percent of GDP for selected years. The table shows that the main decline in public expenditures was in the central government. This is of course not surprising, as the central government is responsible for the three conflict-related costs, defense expenditures, interest payments, and support for the business sector. Hence, the share of the central government in total public expenditures declined from a high level to around half in 2018. Expenditures by the national institutes declined as well, due mainly to the decline in immigration since the 1990s. The expenditures of the other parts of the public sector did not change much, except for one jump in 1995 for public NGOs, as a result of the new health law.

Table 12.4 also shows that the central government covers costs for all other parts of the public sector. The revenues of the NII amount to two-thirds of its expenditures, which are mainly welfare payments. The government finances the missing third. Cities and municipalities collect income through property tax (called “Arnona”) and fees, but they still need transfers from the central government for 30 percent of their expenditures. Public NGOs have very low revenues, which consist of tuitions for universities, private additional health insurance to health funds, and donations to both. Hence, the government covers almost 80 percent of their costs. The national institutes receive donations from world Jewry that cover more than half of their costs. The central government covers the remaining costs.

TABLE 12.4. Expenditures and transfers of parts of the public sector, in selected years (percent of GDP)

Institution	Central government	National Insurance Institute	Local government	Public NGOs	National institutes
EXPENDITURES					
1990	34.3	6.8	6.0	6.0	1.16
2000	23.8	7.1	5.8	7.2	0.45
2010	21.1	6.6	5.4	6.8	0.25
2018	19.3	6.6	6.1	6.9	0.23
TRANSFERS FROM CENTRAL GOVERNMENT					
1990	−8.6	2.6	1.6	4.5	−0.04
2000	−10.3	2.2	2.0	6.0	0.09
2010	−9.2	2.1	1.4	5.4	0.16
2018	−10.0	2.1	2.0	5.8	0.09

Source: Data are from Bank of Israel (2019c, table 6.A.9 (1)).

The non-central government parts of the public sector supply important services in Israel, mainly education, health, welfare, and absorption of Jewish immigration. Municipalities supply education from grades K to 12, although most of the finance comes from the Ministry of Education in the central government. Universities and public colleges supply higher education, financed mainly by the Ministry of Education through the Commission for Higher Education ("MALAG"). There are few private colleges and no private universities in Israel. The main suppliers of health care are the four health funds and the public hospitals. The National Institutes promote and absorb Jewish immigration. They also have an additional role of supporting settlements in the occupied territories without directly involving the central government. They do this through the Settlement Department in the Zionist Organization and the Jewish National Fund.

The central government supplies the other public services. The main one is defense, supplied by the Ministries of Defense and of Internal Security. The Ministries of Internal Security and of Law supply law and order, and the Ministries of Infrastructure, Transportation, and Energy supply investments in infrastructure. However, the most powerful economic ministry in Israel is the Ministry of Finance. It plans the annual budget, without much consideration for the views of the other ministries. It approves all public spending, as the accountants in all ministries are subordinate to the accountant-general in the Ministry of Finance. The Ministry of Finance designs the tax policy, through its chief economist, and implements it as well, through the tax authority. The authority of government companies is part of the ministry as well. The wage commissioner in the ministry controls wages in all of the public sector. Another important position in the ministry is the supervisor of capital markets, who oversees insurance companies, pension funds, and similar financial institutions. In addition, the Ministry of Finance plays a major role in all economic discussions in the government and in the Knesset with its committees.

DEBT AND DEFICITS

The public deficit is equal to the annual increase in public debt. Hence, deficits increase debt. However, if the economy is growing, the debt-to-GDP ratio might fall despite the growing debt, if the deficit is not too large. Appendix 8 analyzes this issue. It shows how the low deficit of 3 percent of GDP since 1985 has reduced the public debt-to-GDP ratio significantly, from 150 percent of GDP in 1985 to 61 percent of GDP in 2018.[18] This is the net public debt, which is gross debt minus foreign assets held by the Bank of Israel. This debt reduction has been a

significant achievement for Israel and is a direct result of the low deficits and fiscal discipline since 1985.

The current public debt-to-GDP ratio of 61 percent is very close to the European target set by the Maastricht Treaty of 60 percent. This achievement is impressive, because most EU countries are still far from this target. The public debt of Austria in 2018 was 79 percent of GDP, of France 97 percent, of Italy 131 percent, and of the United Kingdom 87 percent. Israel also set a debt target of 60 percent of GDP, but in 2014, when it came close to this target, it changed the target to the more ambitious 50 percent of GDP.[19]

In addition to its debt target, Israel also set deficit targets for the short run, which changed annually, and for the long run as well. For many years, the long-run deficit target was 1 percent of GDP, but recently it changed to 1.5 percent of GDP. Appendix 8 examines whether the two targets, of the debt and the deficit, are compatible. Surprisingly, they are not. Appendix 8 shows that if the debt-to-GDP target is 60 percent, then the required deficit target should be 2.9 percent of GDP. If the debt target is 50 percent of GDP, the deficit target should be 2.4 percent of GDP.[20] Thus, the current long-run deficit target of 1.5 percent of GDP is much too low for the debt target. If the government keeps this target, debt will reach 29 percent of GDP, far below the current target. Clearly, the government should avoid this inconsistency.

The Diet of the Fat Man

This chapter shows that public expenditures have declined continuously relative to GDP since the peace with Egypt in 1980. Leading this decline were expenditures related to defense, which are direct defense spending, interest payments, and support to the business sector. However, social services, such as education, health, housing, public transportation, and welfare, did not increase and some even declined relative to GDP. Hence, the reduction of the public sector and of taxes, especially direct taxes, has been a consistent policy, backed by a law, called the "expenditure rule." All governments since the 1980s shared this policy. Why?

People from the government raised two main justifications for this policy. The first was that keeping a balanced budget requires a reduction of public spending. The second justification was that reducing the public sector helps economic growth. Benjamin Netanyahu even explained this claim by a figurative fable. He described the large public sector as a fat man, sitting on the shoulders of a thin man, who represents the business sector, and thus obstructs the ability of the thin man to run forward fast. Putting the fat man on a diet would enable the thin man, and the economy as a whole, to run much faster.

I claim that the first justification for the reduction of public expenditures does not hold water, since in parallel with reducing spending, the government also lowered taxes. This should increase the deficit and harm fiscal discipline. You cannot justify a policy by fiscal discipline, if at the same time you contradict it by another policy. Indeed, since 1985 the public deficit has been relatively low, at an average of 3 percent of GDP. Hence, there was no urgency to reduce expenditures. Even in recession years, such as 2001–2004 and 2009, when tax collection weakened and the deficit increased, it was a temporary increase, which did not require long-term policy changes.

The claim that a large public sector is harmful to growth is not new, but it does not have serious support in economic theory. Its main theoretical justification is the distortionary effect of income tax. While employers care about the gross wage, workers care about the net wage. Thus,

high income tax rates raise the gross wage, so employers hire less labor, and lower net wages, so employees tend to work fewer hours. This is why a high income tax, which is the result of higher public expenditures, might reduce the input of labor and thus also GDP. Another claim is that public transfers reduce work incentives.

However, there are some problems with these arguments. First, if the supply of labor is inelastic (that is, not much affected by changes in wages, as indeed many empirical studies show), then the effect of income tax on GDP would be small. Second, a higher income tax finances public services, which help to overcome severe market failures. Hence, it reduces economic distortions and increases GDP. Education raises human capital and thus output, health care reduces loss of work from sickness, public transportation helps people stay longer on the job. Hence, the overall effect of higher spending, which economists call the "general equilibrium effect," might not be necessarily negative.

If the theoretical analysis of the effect of public expenditure on GDP is inconclusive, this should require an empirical examination of this relationship. Lindert (2004) is a broad historical study of this issue over a long period of more than 2 centuries. He reaches the conclusion that larger public sectors do not reduce output. Many recent empirical studies on the relation between public spending and growth reach inconclusive results as well.[21] It therefore shows that the negative effect of taxation and the positive effect of reducing market failures cancel out each other, so that the overall effect of the public sector on GDP is close to zero.

One of the main difficulties such empirical studies face is that in addition to the effect of the public sector on GDP, there might be an opposite effect of GDP on public spending. This effect is positive, as according to Wagner's Law, richer countries tend to have relatively larger public sectors. Disentangling the two effects is quite difficult. However, the historical experience of Israel is a very good case study that overcomes this difficulty.

In 1973, public expenditures in Israel were at the high level of 74 percent of GDP. In 1975 and 1976, they even reached 80 percent. Since then they have declined to around 40 percent of GDP in recent years. This decline is very sharp, and we can therefore say that the fat man went on a drastic diet. Furthermore, most of this decline was due to the peace with Egypt, which was a significant geopolitical change in the Israeli-Arab conflict. Hence, this change in fiscal policy was truly exogenous, and in this case, there is no significant reverse causality from GDP to public spending. Therefore, we can view its effect as a pure natural experiment.[22] The results of this experiment are very clear. As shown in chapter 2, the decline of fiscal expenditures had no effect on Israel's economic growth, as Israel has been growing steadily since 1973, at an average rate of 1.7 percent annual growth of GDP per capita. Its business sector also has grown steadily since then, as shown in chapters 2, 3, and 4.

This finding is very important for the policy debate in Israel, as many still argue that reducing the public sector might encourage growth. However, I believe that this finding carries an important lesson beyond Israel as well. This is a case study of a developed country that reduced its public expenditures by half, lowered its tax rates significantly (thanks to a geo-political change, which appears to be exogenous to the economy), and still its growth performance did not change over these years. Hence, this case offers strong support to the claim that the size of the public sector has at most a very small effect on economic growth. This finding is very important for countries that are considering the question of how large their public sector should be. The finding suggests that this is not an economic question but rather a political one. The size of the public sector depends on how much inequality the country wants to tolerate.

Which brings us back to the question: Why did Israel adopt the policy of reducing public spending for so many years? If the answer is not fiscal discipline or promoting growth, then it is the political preferences of the Israeli leadership. The leaders, and more widely the Israeli elite, hold a neoliberal worldview, which favors a small government and low taxes.[23] It is possible that this is not just pure ideology but is also a result of tight connections between politicians and businesspeople, who always favor lower taxes. Neoliberalism is of course not unique to Israel, and it has been a very powerful trend in all Western countries over the past 20 years. However, its effect on Israel has been relatively strong, and Israel has one of the smallest public sectors among the OECD countries, as figure 12.1 shows, if we deduct defense costs, as explained above.

One question this observation raises is why Israel adopted such strong neoliberal policies, even more so than did many other countries. I think that the explanation lies in the analysis of chapter 11, which shows that the labor movement in Israel did not have significant social democratic characteristics early on. Its most prominent leaders, like Ben Gurion, Eshkol, Sapir, Peres, Rabin, and Barak, cared mostly about the success of the private sector. Hence, when neoliberal ideas began to surface during the 1970s, they faced no opposition in Israel across the political spectrum. In European countries, it took more time to transform the positions of the Social Democratic parties. Mitterrand, Schroeder, Blair, and Clinton shifted only in the late 1980s and early 1990s. In Israel, the shift happened earlier.

Another interesting question is whether the Israeli public shares and supports this neoliberal trend. The social protests of 2011 suggest that there may be a gap between the policy of reducing the welfare state and public opinion. Dahan and Hazan (2014) discuss this issue, using public opinion polls. They focus on education, health, and welfare and find that in these areas, Israel has reached much lower levels of services than in OECD countries. They find that this is especially true for welfare generosity, where Israel ranks twenty-third out of 28 OECD countries for which data are available. They also find that these low levels of services do not match the preferences of the Israeli public. Another area where Israel is seriously lagging behind is public transportation. This issue has become acute, due to the growing congestion on Israeli roads, as described in chapter 4. To get an idea of the underinvestment in public transportation, note that the metropolitan area of Tel Aviv, with population of close to 4 million, still does not have a rail system. Only now has the government begun to build a light rail system, and it plans to begin building an underground rail only in 2026.

Privatization of Public Services

The reduction of public expenditures is actually a process of privatization, as more of these services receive private finance through the expansion of private education and private health care, for example. However, the main privatization in Israel is in the performance of services, even if financed publicly. The government gradually transfers their production to private companies, or to workers who are not public employees but instead work through private contractors. This process, also called “outsourcing,” or “indirect employment,” is common in many countries and is advancing rapidly in the Israeli public sector.

There are several types of privatization of public services. The first is filling various vacancies in the public sector by workers from manpower companies, instead of directly hiring workers for these jobs. Such hiring avoids granting tenure and other labor rights to such workers.

The second type of privatization is to hire services of various companies for specific services, mainly cleaning and the provision of security guards. This enables the government to reduce its costs, as the contractors pay such workers lower wages than they would earn in the public sector. A third form of privatization holds for more professional services, performed usually by various NGOs. For example, more than 10 percent of teachers work for NGOs instead of for the government, which thus avoids their employment during summer vacations and avoids granting them other benefits that have been achieved by unionized teachers.[24] Universities and colleges also employ many teachers on a temporary basis rather than hiring them as permanent faculty.

There are many other examples for outsourcing professional services by the public sector. The welfare services use the work of many nurses and social workers from private nursing companies. The Ministry of Defense outsources checkpoints in the West Bank to security companies and uses catering companies to feed much of the military. The Ministry of Education does a large part of its supervision through a private company, whose workers used to be supervisors in the ministry. Recently, the government even outsourced its most prestigious role, policy planning. In 2011, the government auctioned the planning of economic and social policy for Israel. The American Rand Corporation won the competition.

What is the reason for the privatization of public services? The main justification of the government, as elsewhere in the world, is economic efficiency. The government claims that the private sector is more efficient than the public sector, so it can perform certain roles better. However, such claims reflect a poor understanding of the concept of economic efficiency and suffer from various failures, four of which I describe here. The first is confusion between efficiency and cost reduction. Moving from direct hiring of cleaners to hiring them through a contractor usually reduces their wages and thus reduces the cost to the government. However, this is not a gain in efficiency but a redistribution of income. Incomes of cleaning workers decline, while incomes of taxpayers rise. This is actually a redistribution from poor to rich.

A second failure of economic efficiency in outsourcing emerges when a private company produces a different service from what the public intends, due to the company's own interests. The best example is the US experience with private jails, which not only do not rehabilitate prisoners but also create strong lobbies for expanding incarceration. There are similar examples in Israel of such effects, such as the private diagnosis of learning disorders, acknowledged by public schools. The result is that many children from rich families happen to have learning disorders, while fewer children from poor families are diagnosed with such disorders.

A third failure of economic efficiency in outsourcing emerges when contractors do not internalize some external effects of their activities. One example is the new water corporations, which replaced water departments in municipalities. These corporations began to shut down water services for families that did not pay their bills. Previously, water departments in municipalities did not resort to such methods, as they were aware that it might further stress the family and so place more burden on the welfare department in the municipality. Thus, they internalized this externality, while the water corporations that replaced them did not. After a few years and many complaints by municipalities, the Knesset passed a law that forbids shutting down water service to families.

A fourth failure arises as a result of many privatizations creating monopolies, either global or local. One such example is the recent Covid-19 crisis and how the government dealt with it in Israel. It purchased much of the required personal protective equipment through new private contractors, instead of using the services of government agencies that do procurement. The result

was dismal: Much of the equipment purchased was not adequate, and the costs were too high. It is true that the government agency might be a monopsony as well, but it is a more experienced and more responsible monopsony.

Hence, economic efficiency is not a sweeping justification for outsourcing, so we need to look for its motivation elsewhere. One explanation is adherence to the neoliberal ideology, which advocates provision of as many services as possible by private companies instead of the public sector. Uri Yogev, a top director in the Ministry of Finance when Netanyahu was the minister, gave this approach a vivid expression, saying that they intend to "privatize everything that moves." Another explanation is the strong ties between politicians and businesses, a phenomenon called in Israel "capital–government ties." Such ties promote outsourcing as well.

It is hard to measure the extent of privatization of public services due to lack of direct data. However, we can derive an indirect estimate from the distribution of public spending between wages and purchases. Before privatization of a service, its cost is part of wage expenditures, while after privatization, it is part of purchases. The following is a calculation of the privatization of civilian consumption.[25] In the early 1980s, spending on wages was 80 percent of civilian public spending. Comparison with spending in 2018 requires not including the health tax, added only in 1995. In 2018, spending on wages was 56 percent of civilian public consumption without the health tax. Hence, wage spending declined by 24 percent of public civilian consumption, which is approximately 4 percent of GDP. Hence, this is the estimated annual flow of privatized public services.[26] This calculation shows that privatization of public services is 20 to 30 times larger than the value of privatizing public companies, which amounts in annual terms to only 0.15 percent of GDP. Note that this estimate is biased downward and does not include privatization in defense.

Economists or Politicians?

This chapter shows how Israel has followed the neoliberal approach consistently since 1980. Public expenditures declined dramatically from 80 percent of GDP in the mid-1970s to less than 40 percent of GDP nowadays. Although the decline was mainly the result of the peace with Egypt, the government did not shift the freed-up resources to other social services but reduced direct taxes instead and even reduced some services. The government also privatized the provision of many public services. All governments since 1985 followed this policy, whether they were Likud, Labor, or one of the many center parties that emerged during this period.

Who led this strong adherence to the neoliberal ideology? Many Israelis, politicians and social scientists as well, place the responsibility on the professional economists in the government, mainly in the Ministry of Finance and in the Bank of Israel, which is formally the economic advisor of the government. However, it is hard to believe that Israeli politicians are so weak that they will let a group of young professionals to dictate to them such important decisions.[27] Often politicians like to attribute policies to economists, to let policy making seem more professional, or to reduce the political opposition to their decisions. However, we should remember that the politicians give power to the professionals, and so the former actually set the policies.

Some observers put the blame for the neoliberal shift on academic economists, who taught the professionals. It is true that many academic economists believed very strongly in free markets and small public intervention, and they might have influenced the politicians. However,

in past decades, academic economists became much more diverse, as neoclassical economics became broader in its analysis and less uniform in its policy recommendations. Still politicians preferred to listen to some economists and not to others.

The following examples demonstrate the importance of political support for economic policies. When Netanyahu was minister of finance in 2003–2005, he led a significant reduction of expenditures, mainly of welfare subsidies. He later claimed, as did many economists, that Israel experienced a severe structural economic crisis and he saved the economy from collapse. This was a gross misrepresentation of the situation. Israel experienced a deep recession in 2001–2004, due to the Second Intifada coupled with a global recession.[28] The recession reduced tax revenues, so it increased the deficit and the debt. However, the recession, like all recessions, was temporary and ended in 2004 after the global recession ended and the army suppressed the Intifada. What actually enabled Netanyahu to lead contractionary policies was that for the first time in many years, the Likud coalition did not include the Ultra-Orthodox parties that usually strongly oppose cuts in welfare, as their constituency is very poor. Later, when Netanyahu formed coalitions with the Ultra-Orthodox parties, he did not reduce welfare transfers.

When Netanyahu became prime minister the second time, in 2009, he did not resort to direct reduction of expenditures, but he planned to reduce direct taxes drastically. This strategy, known in the United States as "starve the beast," leads to future pressures to cut expenditures, to reduce long-run deficits. However, this time Netanyahu was opposed by the professional economists in the Ministry of Finance and in the Bank of Israel, who were afraid of loss of fiscal discipline. In 2011, their opposition bore fruit. The Trajtenberg Committee, which was formed in response to the social protests of 2011, strongly recommended stopping tax reductions. Netanyahu complied.

A third example for the importance of political support for neoliberalism was the service of Moshe Kahlon as minister of finance in 2015–2019. Kahlon was a head of a medium-sized party, who joined the government of Netanyahu on condition that he become minister of finance. Kahlon had more social sensitivity than most other politicians have, so during his term, the reduction of public expenditures stopped. Some budgets, like housing, even increased.[29]

These examples show that despite the support of many economists for neoliberalism, the real proponents of these policies were the politicians, of whom most were neoliberal. Hence, the politicians are responsible for the strong neoliberal transition in Israel.

1. Much of the public discussion in the United States focuses on fiscal policy as a stabilization policy during the business cycle. This chapter looks at the long-run size and activities of the public sector. However, the seventh section in chapter 7 discusses the cyclical aspect of fiscal policy in Israel.

2. See Maddison (2001), table 3-9.

3. According to Lindert (2004), p. 4, public sectors in these countries were around 3 percent of GDP by the end of the eighteenth century.

4. The increase in public expenditures relative to GDP fits the famous Wagner's Law: As income rises, public spending rises by more than income. See Biel (1998).

5. See Smith (1901).

6. Galor and Zeira (1993) present an explanation of such a market failure and analyze its consequences.

7. See Barro and Lee (2020).

8. The Influenza Pandemic of 1918–1920 was probably one of the main triggers of modern public support for health.

9. However, one should be careful with such comparisons. In many OECD countries, the government pays a large share of pensions. In Israel, the government pays a much smaller share, but it regulates and supports the rest of the pensions. This difference explains part of the relatively low level of expenditures in Israel.

10. These include both disabled individuals in general and victims of hostilities.

11. Interestingly, the right-wing parties campaigned for the law for many years, in their attempt to weaken the Histadrut.

However, the Labor government finally implemented it. The key players in this development were Rabin and Haim Ramon, who was minister of health and later headed the Histadrut.

12. The basic basket does not cover all medications and does not include dental and eye care.

13. See Bank of Israel (2019c), table 6.A.12.

14. See table 3.2 in chapter 3.

15. See table 2.4 in chapter 2.

16. National Insurance Institute (2012). Another reason for worry is the growing longevity in Israel.

17. Data from Chief Economist (2017), tables 18.4 and 18.5.

18. See Bank of Israel (2019c), table 6.A.18.

19. The coronavirus crisis, which began in 2020, increased public debt in Israel, but public debt has increased in all other developed countries as well.

20. Until 2018, public spending did not include indexation costs, with indexation of 50 percent of the public debt. From 2018 on, expenditures include indexation costs. The calculations in appendix 8 are for the new procedure.

21. A partial list of such papers is Barro (1991), Slemrod (1995, 1998), Agell, Lindh, and Ohlsson (1997, 1999), Atkinson (1999), Gemmell, Kneller, and Sanz (2011), and Jaimovich and Rebelo (2017).

22. One can also view the peace with Egypt as an instrumental variable.

23. In the March 2021 elections, one of the medium-sized parties in Israel, Yemina, came out with an extreme proposal to cut income tax rates by 15 percentage points.

24. See Gruber (2015).

25. It is hard to use this method to measure outsourcing in defense, due to frequent purchases of expensive weapon systems.

26. These calculations are based on Bank of Israel (2019c), tables 6.A.2(2), 6.A.6(1), and 6.A.12.

27. The economists in the Budget Department in the Ministry of Finance, the most powerful department in the ministry, are usually very young. In the 1960s, they got the nickname “the Patinkin kids” (after the reknowned Israeli economist Don Patinkin).

28. See chapter 7 on Israeli business cycles.

29. This was also the result of the widespread public outrage at high housing prices in Israel.

13

Inequality

Inequality: Between the Labor Market and the Government

While previous chapters on economic growth and business cycles discussed the determination of total income in the economy, this chapter analyzes the distribution of income among individuals, or more precisely among households. Since income is not equal across people, the terms “distribution of income” and “inequality” are interchangeable. Clearly, we can measure inequality not only for income but for wealth and consumption as well. However, we usually measure it for income.

There are two reasons for that choice. One is that data for income are more widely available and more accurate. The second is that differences in income drive both differences in wealth and in consumption. People divide their incomes between consumption and savings, and the savings add to their previous wealth. In other words, the annual change in wealth is equal to the savings in that year. Hence, the distribution of income determines the long-run distribution of wealth.[1] Similarly, income determines consumption. According to Friedman (1957), each person consumes her permanent income, which is the future anticipated average income. Hence, the distribution of income determines the distribution of consumption as well.

Before presenting data on income inequality, let us clarify that we are dealing with two types of income. One is market income, which is the income people receive before paying direct taxes, mainly income tax and social security, and before receiving welfare subsidies. The other income is disposable income, which is the final income after receiving transfers and paying direct taxes. The distinction between these two types of income is very important, and we return to it below. Economists also distinguish between individual income and the income of a household. When doing income comparisons for households, economists do not simply add the incomes of all earners in the household; instead, they weigh the income relative to the size of the household. The reason for that are returns to scale in household management. The income needed to cook the same food per person in a household of five is not 2.5 times the income needed for a household of two, but lower. Finally, the common measure for inequality is the Gini coefficient, which measures how unequal a distribution of income is. The Gini coefficient ranges from 0 (full equality) to 1 (extreme inequality, where one person holds all income in the economy).

Let us return to the distinction between market income and disposable income. While market income is an important indicator of earning ability, disposable income is more important, for two reasons. First, it is what people use to determine consumption and saving. Hence, disposable income determines standards of living. However, disposable income also affects the market income of the next generation. People use their disposable income to pay for the education of

their children, and thus they affect the future income of their children, according to the theory of human capital. Hence, disposable income is the main type of income economists consider when they compare inequality.

Inequality of disposable income in Israel is high relative to that of OECD countries, which should be the country's relevant group of reference. The last measurement across the 36 OECD countries took place in 2016, except for a few countries, which measured it in 2015 and 2014. The Gini coefficient for disposable income in Israel was 0.346. Most OECD countries had lower Gini coefficients, except for Latvia (0.346), New Zealand (0.349), the United Kingdom (0.351), Korea (0.355), Lithuania (3.78), the United States (0.391), Turkey (0.404), and Mexico (0.458). Hence, Israel is in the top quarter in the OECD in terms of inequality. Of the twenty-seven other countries, the most egalitarian was the Slovak Republic (0.241). One goal of this chapter is to understand why inequality in Israel is so high.

Why should we care so much about inequality? Part of the answer is political and depends on the type of society we want. Those who value solidarity try to reduce inequality. In Israel, as in many other countries, inequality has further political importance, as it overlaps with ethnic divisions, between Jews and Arabs, Ashkenazi and Mizrahi Jews, and other divisions. This further increases social tensions in the country. However, inequality has some economic effects as well, which also make it important. These economic effects explain why the topic of inequality has gained prominence in economic analysis in recent decades.[2] There are two additional developments, one empirical and one theoretical, which also contributed to its prominence. One is rising inequality in the real world, and the other is the growing ability of economists to build theoretical models with heterogeneous agents, which is necessary for analyzing inequality.

One clear economic effect of inequality is through incentives. Some jobs require special efforts, and people apply effort only if these jobs pay higher wages. One such effort is acquiring education, which is costly in itself and also because it delays entry into the labor market. People study only if education awards them with higher wages. Hence, some inequality is required to encourage education, which increases output and income. However, inequality might have a negative effect on the acquisition of education by the next generation. Studying is a long-run investment, and parents invest in education of their children at an early age, while the fruits of education are realized much later, throughout the offspring's life. Poor parents find it hard to make such investments, since capital markets are imperfect. Hence, if there are many poor families, fewer children will acquire education, and output in the next generation will be low.[3]

This market failure is part of the explanation for the rapid expansion of public education over the last 150 years.[4] Indeed, once public education is available, the income of the family matters less for the education of its children, but its effect is not entirely gone. Even in Israel, which has very little private education, a quarter of education costs is private. Hence, income distribution still affects access to education. Furthermore, public education is not uniform across towns and neighborhoods, and it reflects economic well-being in these locations. Hence, inequality still affects education of the next generation and with it output and income.

Inequality might also affect economic activity through automation, or the adoption of machinery. The incentive to replace workers by machines depends positively on wages.[5] As a result, in sectors with low wages, there might be less technical change. One example of such an effect might be sectors with high concentration of foreign workers, who usually earn low wages. This scenario fits the story of construction in Israel, which used to be a fast-growing sector.

In 1970, the government allowed Palestinians from the occupied territories to work in Israel, and they became the main workers in construction. In the early 1990s, the government began to replace Palestinian workers in construction with workers from Romania, Turkey, and China, but these construction workers remained foreign. The effect of the shift to foreign labor on productivity was significant. In 1961–1973, total factor productivity in construction grew by an annual average rate of 4.6 percent, while total business productivity grew by 4.0 percent. In 1974–2018, average annual growth rate of business productivity was 1.1 percent, while in construction it was only 0.4 percent.[6]

Inequality has other economic effects, which are less direct. It can cause anger and resentment, which might lead to political unrest and even to violence. One reason for this anger is that inequality has a positive correlation with low intergenerational mobility, an economic relationship called "the Great Gatsby curve." One explanation for this correlation is that inequality and poverty reduce access to education, and that lowers intergenerational mobility. Hence, inequality and low mobility cause anger and violence, which might reduce investment and output, due to the risk of social unrest.

Thus, inequality has both positive and negative economic effects. Reducing it can improve economic performance but might hurt some incentives as well. Hence, the decision of how much inequality a society should tolerate is mainly political. It depends on the social preferences toward equality and on the degree of solidarity in society.

What makes inequality high or low? Here the distinction between market income and disposable income is crucial. Inequality in market income is determined in the labor market, which sets wages of workers, but also determines profit—namely, the incomes of employers—as profit is the residual after paying wages. Hence, all market incomes are determined in the labor market. The difference between market income and disposable income is due to direct taxes and welfare subsidies, which are both fiscal variables. Hence, inequality of disposable income depends on the government and its policies. This chapter first analyzes the effect of labor markets on inequality of market incomes and then turns to the effects of public policies on inequality of disposable incomes.

The Factor Distribution of Income

The analysis of the distribution of market income begins with the distribution of income between the two main factors of production, labor and capital. Economists call it the "factor distribution of income." Clearly, this distribution is set in the labor market, as the sum of individual wages adds up to the total wage bill of labor. The remaining output, after deducting depreciation costs, is profit, which is the income of capital.

Appendix 1 shows, that if productivity is labor augmenting, the average wage should be proportional to output per worker over time. Thus the share of labor income in output should be constant. Indeed, many empirical studies have confirmed this and have found that the share of labor income in output is stable across countries and over time, being equal to about two-thirds. This is one of the famous stylized facts observed early by Kaldor (1961). Over the past 20 years, the share of labor in Western countries has experienced some decline, but it is still above half.

Figure 13.1 examines this theoretical prediction in Israel. To measure output more accurately, it focuses on the business sector only.[7] It compares real output per hour with the real wage in this sector, where the continuous curve plots output per hour in the business sector, and the dashed

curve plots average wage in the business sector. The theory predicts that the two variables should be proportional to one another, so the two curves should be parallel on a logarithmic scale. To examine it visually in the diagram, the figure artificially makes the two curves coincide in the initial year of the data, 1969. Hence, figure 13.1 does not give us a true comparison of the levels of output per worker and wages, but rather of their changes over time, which the figure compares accurately.

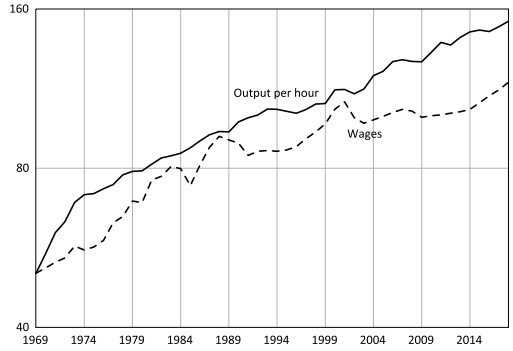

FIGURE 13.1. Real output per hour and real wages in the business sector, 1969–2018.
Data on output per hour in the business sector are from Bank of Israel (2019c, table 2.A.9). Data on wages are from the series RW_BS.Q_SA in the Bank of Israel website, https://www.boi.org.il/he/DataAndStatistics/Pages/Series.aspx, accessed on December 22, 2019. Both variables are on a logarithmic scale of 2.

Figure 13.1 shows that for most of the period, output per worker and wages moved together and were proportional to each other. There were three periods in which the wage lagged behind output per worker. One was the inflationary period, from 1970 until 1985. In that period, rising prices eroded real wages, and the mechanism of compensation for inflation was partial. The second period was between 1989 and 1999, during the large immigration from the ex-Soviet Union. The immigration increased unemployment, which had already begun in the recession of 1989, and unemployment pushed down wages. As a result, the curve of wages during this period is below output per worker. In both events, wages caught up with output per worker by the end of the period, in 1988 and in 2000, respectively.

The third time wages departed from output per worker was after 2000. This time the departure was the largest and longest. Although wages have been growing faster since 2014, they are still far from catching up with labor productivity. In 2000–2018, output per hour increased by 35 percent, while wages increased by only 12.5 percent. Hence, wages still need to rise by 20 percent to catch up with output per worker. Other evidence for the relative decline of wages is the rise of profits during this period, shown in figure 13.2.

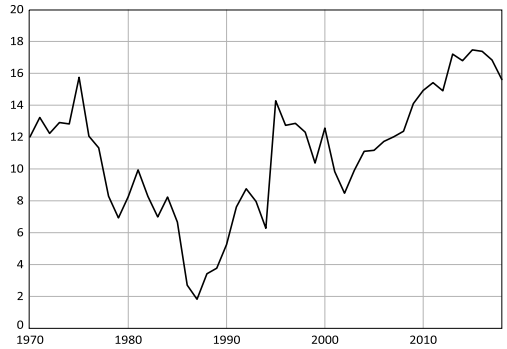

FIGURE 13.2. Rate of net profits in the business sector in Israel, 1970–2018.
Data are from Bank of Israel (2019c, table 2.A.9).

Figure 13.2 shows that during the most recent two decades, profits increased significantly, from an average of 9 percent before 2000 to more than 16 percent recently. Together, figures 13.1 and 13.2 carry two important implications. First, they show a departure after 2000 from the prediction of economic theory that wages should rise by the same proportion as output per worker. In other words, the labor share declined significantly after 2000. The second implication, which is more socio-political, is that economic growth in Israel since 2000 did not "trickle down" to the vast majority of Israelis, that is, employees and self-employed workers. In popular terms, economic growth did not reach the 99 percent. The feeling that economic growth benefits only the top led to much frustration and anger. It is one of the explanations for the social protests of 2011, which focused the public spotlight on inequality in Israel.

Why Has the Share of Labor Declined?

As mentioned above, the share of labor has declined in recent decades not only in Israel but in many Western countries as well, especially in the United States. Hence, studies on other countries can benefit our understanding of what has happened in Israel as well. Research on this decline has begun only lately, after economists fully understood its scope and persistence. One of the main explanations is that it is a result of significant departure from perfect competition. S. Barkai (2020) relates the decline in the United States to growing monopolistic power, which enables firms to raise prices and profits above the normal returns to capital. Instead of focusing on the goods market, Benmelech, Bergman, and Kim (2020) turn to the labor market. In a cross-county study of the United States, they find growing monopsony power of firms in the labor market, since there are fewer firms per county and firms tend to be larger. These authors also show that the power of workers has declined significantly, mainly due to erosion of unions.

We can rephrase the story of Benmelech, Bergman, and Kim (2020) in the following way. Labor markets in general are not perfectly competitive. On one hand, a large firm that employs many workers has much power over wage setting, so it is not competitive. On the other hand, employees can unionize and act collectively, which deviates from perfect competition as well. In the past, these two deviations from perfect competition canceled each other, and the equilibrium in the labor market was close to the competitive equilibrium. This has changed lately, as employers became stronger as buyers, and employees became weaker as sellers. I next show that this shift in the relative power of firms and workers occurred in Israel as well.

The Histadrut (General Union of Workers in Israel) played a key role in building the state and

the economy; it was never a regular union. It was more concerned about creating jobs for new immigrants than about organizing them in workplaces. As a result, the Histadrut became a large employer, which owned construction and infrastructure firms, like Shikun Ovdim and Solel Boneh, and industrial firms, under the umbrella of "Koor Industries." In addition, it controlled the main health fund in the country, the General Health Fund; it controlled most pension funds; and it owned a large bank, Bank Hapoalim. The Histadrut had significant political power, and most of its leaders did not come from the rank and file of workers but from the top leadership of the Labor party.

This power eroded dramatically in the 1980s and 1990s. In the bank shares debacle of 1983, the Histadrut lost its control over Bank Hapoalim. In the late 1980s, Koor Industries suffered severe losses, and the Histadrut had to sell this conglomerate to private ownership. During that period, the pension funds of the Histadrut accumulated significant actuarial deficits, and in 1995, the government nationalized them. In the same year, the government adopted the Health Insurance Law, which disconnected the General Health Fund from the Histadrut and made it independent. In 1996, the Histadrut had to close its newspaper, *Davar*, due to financial difficulties. By the mid-1990s, the Histadrut found itself without its past economic assets and had to learn to operate as a labor union, whose main goal is to represent workers. This was not easy to learn. In the past, the Histadrut was a noncombative union, because it was a general labor union, because of its commitment to the Zionist project, and because it was itself a large employer. Now it had to change.

Change was not easy and has not yet been completed. Until 1980, the Histadrut organized most workers in Israel, except for a few small unions of high-school teachers, university professors, and doctors that had split earlier from the Histadrut. In 1980, 80 percent of the workers in Israel were unionized. Since then, the share has declined to around 20 percent. Clearly, part of this decline was due to the loss of the economic assets of the Histadrut, especially the health fund and pension funds, which helped it to recruit members. However, the decline of organized labor shows not only in membership.

Another measure of the power of labor is coverage of workers by collective bargaining. These are workers who enjoy wages set in trade union agreements, even if they are not union members. Kristal et al. (2015) study this issue in Israel over the years, using Central Bureau of Statistics social surveys. They find that in the 1980s, the coverage of collective bargaining was 80 percent, but it declined to 56 percent in 2000 and to 50 percent in 2012. Here, too, we see a significant decline in the strength of trade unions in Israel.

An additional measure of the relative power of labor in Israel is government regulation in the labor market, especially employment protection. I use EPL (Employment Protection Legislation), which is an index measured by the OECD for its member countries. It is a result of a survey of experts, who answer twenty-one questions on three topics: protection of employees from personal dismissal, protection of employees from collective dismissal, and protection of temporary workers. The results are on a scale of 0 to 6, where higher values indicate stronger regulation and protection of labor. In 2013, Israel scored 2.35 for protection against personal dismissals, while the OECD average was 2.04. However, for protection against collective dismissal, Israel scored 1.89, while the OECD average was 2.9. For protection of temporary workers, Israel scored 1.58, while the OECD average was 2.08. Hence, the overall protection of Israeli workers is weak in international comparison.

The decline in power of workers was not unique to Israel and happened in many Western

countries at the same time, for similar reasons. One reason was the shift in production in the West, from manufacturing, which is more conducive to organized labor, to new global services, such as communication, computerization, finance, which use mainly personal labor contracts to avoid unionization. This shift is especially strong in Israel, due to the large high-tech sector, which employs more than 10 percent of workers. Another reason for the weakening of labor bargaining power was increased privatization of various services. As chapter 12 shows, such privatization is extensive in Israel, especially in the public sector.

In general, the rise of neoliberalism in the West has had a significant adverse effect on unionization. Earlier, there was a wide understanding that organized labor was important to prevent social unrest and to curb the spread of communism in Europe. However, that view began to erode in the 1970s. First, the unemployment after the 1973 energy crisis weakened unions. In the early 1980s, US President Reagan and British Prime Minister Thatcher further weakened unions in their countries, Reagan in his fight against air controllers and Thatcher against coal miners. The decline of unions intensified after the collapse of the Soviet Union in the late 1980s. First, it removed the communist threat and reduced the political incentive for supporting labor unions. Second, many in the West viewed the fall of Soviet communism as a strong vindication of the capitalist system, which strengthened the neoliberal approach. As a result, many Western countries tightened restrictions on unions in workplaces, which gradually weakened the unions. Similar processes occurred in Israel as well.

Another factor that weakened Israeli workers and lowered their wages, especially those on the lower rungs of the wage ladder, was the significant presence of foreign workers. In the early years, there were no foreign workers in Israel. However, after Israel conquered the Palestinian territories in 1967, it allowed Palestinians to work in Israel beginning in 1970. They worked mainly in construction; agriculture; and some services, such as cleaning and nursing. The First Intifada, which began in 1987, reduced labor of Palestinians in Israel due to strikes and curfews. In 1991, during the First Gulf War, Israel imposed a full closure on the occupied territories for a long time. Since then, the army has adopted this policy with increasing frequency. It is possible that the reason was not only defense related, and the government thought that the new immigrants from the ex-Soviet Union could replace some of the Palestinian workers. This indeed happened in services, but not in construction and agriculture.

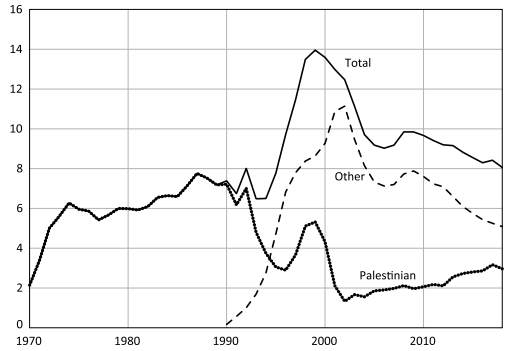

FIGURE 13.3. Share of foreign workers in employment in Israel, 1970–2018 (percent).
Data are from Bank of Israel (2019c, table 5.A.3). I have corrected the data on total employment since 2012 to fit previous data, as done for tables 2.5 and 2.6 and figure 2.4 in chapter 2.

However, since the early 1990s, the government continued to replace Palestinian workers by

others. These were mainly foreign workers from other countries, like Thailand (who work in agriculture), and Romania, Turkey, and later China (in construction). At the same time, the government intensified the closures on the Palestinian territories, especially after the Palestinians gained a limited autonomy in the 1993 Oslo Accords. This policy intensified during the Second Intifada. The disengagement from the Gaza Strip in 2005 stopped the work of Gazans in Israel completely. Figure 13.3 shows the percentage of foreign workers out of total employment over the years. The share of Palestinian workers after 1990 is the dotted curve, of other foreign workers is the dashed curve, and of all foreign workers is the solid curve, which also describes Palestinians until 1990.

Figure 13.3 demonstrates how the share of Palestinian workers increased to 8 percent of the workforce in 1987, began to drop in the First Intifada and has fallen sharply since 1991. Their share reached a low level of 2 percent during the Second Intifada. Since then it has increased slightly to 3 percent of the workforce but is still low. The figure also shows how workers from other countries have replaced the Palestinians since 1990. However, the main message of figure 13.3 is that the share of foreign labor in Israel increased over the years from 6 percent around 1980 to over 8 percent in 2018. This strong presence of foreign labor puts downward pressure on wages and is an additional explanation for why wages have failed to follow the rise in productivity since 2000.[8]

Income Gaps between Workers: Education

In addition to the distribution between labor and capital, there are also wage differences across workers. According to economic theory and many empirical studies, these differences arise for various reasons. Workers acquire human capital (that is, the skills required to perform their jobs) in two main ways: through schooling and through experience, which they accumulate over the years. However, workers also differ by personal ability or talent and by how much they work, either by choice or due to labor market conditions.

This section examines how wages depend on education, measured by years of schooling, and on experience, measured by age. It also examines how wages depend on part-time work, measured by two variables, one is an indicator for part-time employment and the second is the number of days worked per month. The residual variation in wages should be attributed to individual abilities, which we cannot measure directly. We expect schooling and experience to raise wages according to the theory of human capital, as these increase productivity of workers.

Appendix 2 shows that the wage of each worker should be proportional to her human capital. Hence, when economists test how various variables affect wages, they also find how these variables affect human capital. We call such tests “wage regressions,” as they examine the effect of various variables on wages over a large sample of workers, using surveys of thousands or even tens of thousands of individuals. Such tests began in the United States with Mincer (1958) and Becker (1964). Since then, economists have published thousands of research papers that have done similar regressions over various periods and countries. The results were quite similar. In this chapter, I report wage regressions for Israel, using the 2011 income survey by the Central Bureau of Statistics. Appendix 9 describes the detailed results of these regressions, while here I present the main conclusions.

Before turning to the Israeli wage regressions, it is important to comment on the causality between education and wages. Wage regressions find a strong correlation between years of

schooling and wages, but this does not necessarily imply that causality goes from education to wages through higher human capital. It might be that schooling and wages both reflect high talents that raise the two variables in tandem. Many studies have addressed this question in various ways, and most have supported the theory of human capital, namely, that schooling enhances wages.

One of the most famous studies is Angrist and Krueger (1991). They use the fact that American compulsory education does not require a fixed number of years of schooling but education by age. As a result, people born in certain months study 1 year longer than their classmates. Angrist and Krueger find that the month of birth affects wages and interpret it as supporting the claim that adding a year of schooling increases wages, as otherwise the month of birth should not affect future wages. Hence, they use month of birth as a "natural experiment."

A similar natural experiment, which uses Israeli history and data, is Frisch (2008). It uses the extension of free education from 10 years to 12 years, until the end of high school, implemented in 1979. Frisch shows that following the expansion of free education, the number of students completing their high school education increased. It indicates that earlier there was a significant group of students who did not finish high school for financial reasons, but once they could continue their schooling tuition free, they adopted this opportunity. Frisch then shows that for this group, the additional 2 years of schooling increased their wages, which gives further support to the theory of human capital.

In fact, Angrist and Krueger (1991), Frisch (2008), and others find not only a causal effect from schooling to wages; they also show that the size of this causal effect is equal to that measured in standard wage regressions. Based on that result, in this chapter, I apply standard wage regressions without proving causality. Instead, I use the wage regressions to examine differences between groups in the population, mainly women, Arabs, the Ultra-Orthodox Jews, and Jews of diverse origins. The wage regressions focus on employees only and examine market income before tax and subsidies. Appendix 9 presents the full regressions, while here I present only the main results. I first describe the basic regressions on the effect of the three main variables: years of schooling, age, and part-time work.

The regressions examine the effect of both the years of schooling and its square, to allow the return to schooling to change with years of schooling. Indeed, the regressions show that the return to schooling is diminishing, like the return on most inputs in economics. The first year of schooling increases wages by 12.5 percent, the eighth year of school raises wages by 10.5 percent, and the twelfth school year raises wages by 9.5 percent. The fifteenth school year, usually a bachelor's degree, raises wages by 8.7 percent. These figures are not far from the results of many international studies.[9]

The second variable is age, as it stands for experience, moving to better jobs over time, and other improvements in human capital. The regressions control for age and age square to examine the changing effect over age. Indeed, the effect of age is significant. Age alone raises wages by 2.5 times from the age of 22 to the age of 50. The effect of age on wages declines with age as well, and after the age of 50, it even becomes negative, though not necessarily implies a decline in productivity.

The next two variables control for part-time work. One variable is equal to 1 if the worker works part-time and to 0 if she works full-time. The second variable is the average number of workdays per month of the worker. Interestingly, the two variables have independent effects on wages. It turns out that working part-time significantly reduces wages (by up to 50 percent)

relative to full-time employment. In addition, each additional workday per month increases wages by 5 percent. This result is very reasonable, as there are slightly more than 20 working days per month, so this variable captures the simple effect of proportionality of wages to the amount of time worked.

The four variables, schooling, age, part-time work, and ability, therefore account for the large diversity in wages across workers. However, how much do they account for differences in wage distribution over time or across countries? The distributions of age and of ability do not change much over time and across countries. Hence, most of the differences in wage inequality over time and across countries are due to differences in schooling. Differences in part-time work do not seem to change significantly over time and have at most a second-degree effect across countries.

Women, Arabs, Mizrahi Jews, and the Ultra-Orthodox

One of the reasons income inequality is a disturbing issue in Israel is that income gaps adhere to ethnic lines. Arabs, women, Mizrahi Jews, and Haredi Jews earn less than the average. Such gaps in income between ethnic groups are of course not unique to Israel, but they are not so prevalent as well, as they characterize mainly countries with significant immigration, like the United States. However, even compared to such countries, the situation in Israel is more acute, since the immigrations are recent, so the gaps between groups might be quite significant. One question such income gaps raise is whether they are due to less schooling or to discrimination in the labor market.

TABLE 13.1. Averages of years of schooling and income for different groups in the population, 2011

Group in population	Average years of schooling	Average monthly income (NIS)
All employees	14.03	8,833.2
Men	13.86	10,528.8
Women	14.21	7,018.6
Jews and others	14.27	9,246.7
Arabs	12.28	5,806.5
Graduates of yeshiva	18.34	6,525.6
Born in Europe/America	14.57	8,484.6
Born in Asia/Africa	11.61	7,430.7
Father born in Europe/America	15.32	11,640.5
Father born in Asia/Africa	13.72	9,201.9

Source: Data processed from Central Bureau of Statistics (2011a).

Table 13.1 presents averages of incomes and years of schooling for different population groups. These figures are for employees, aged 25 and older, from the income survey of 2011. The survey identifies members of all groups, except for the Ultra-Orthodox, as it does not report religious beliefs. However, the survey identifies Ultra-Orthodox men, since they state that their last school was a yeshiva, but not women. The survey identifies Mizrahi and Ashkenazi Jews by continent of birth or birth of father (namely, Europe/America versus Asia/Africa).

Table 13.1 shows that there are significant gaps between the different groups, both in years of schooling and in wages. Women earn 33 percent less than men do, Arabs earn 37 percent less than Jews do, and Ultra-Orthodox men earn 38 percent less than other men earn. Mizrahi

immigrants earn 12 percent less than Ashkenazi immigrants do. Between these two groups, there are also significant gaps in schooling. Education in Western countries was higher than in Arab countries, which explains part of the gap. Surprisingly, there are gaps between natives born of the two ethnic groups, who grew up and received education in Israel. Average income of second-generation Mizrahi Jews is lower by 21 percent from that of second-generation Ashkenazis.

Table 13.1 paints a disturbing picture, as economic gaps follow the ethnic divides. Hence, it is important to understand these gaps. Since years of schooling are a major explanatory variable to wages, as the previous section shows, this is where we focus next. Indeed, Arabs and Mizrahi Jews have fewer years of schooling, which explains part of their lower wages. However, this is not a full explanation, since women have more education and earn less, and Ultra-Orthodox men have many more years of schooling and still earn less. One explanation for lower wages for women is that more of them work part-time. We examine additional explanations below.

If wages differ across ethnic groups due to differences in schooling, we should examine what causes these differences. More specifically, why do Arabs and Mizrahi Jews have fewer years of schooling? The reason is that even with public education, not all capable kids acquire a full education, as they need additional support from family, both financial and mental. Poor parents, who are also less educated, find it harder to make the additional payments for their children's education and to help them study. In addition to having financial difficulties, the poor usually live in peripheral areas, where public education has lower quality.

Most of the Arab population and many Mizrahi Jews live on the periphery. The Arabs who did not leave Israel in 1948 stayed mainly in rural areas. They still concentrate in three regions: the Galilee in the north; the "triangle" near the northern West Bank; and the Negev, where most Bedouins live. The Mizrahi Jews, who came mainly during the 1950s and 1960s, had to go to the periphery, as part of the policy of settling Jews near the borders, in moshavim and "development towns." Hence, due to insufficient finance and to life in the periphery, gaps in schooling do not disappear quickly and might take a few generations to overcome.

Table 13.2 describes the distribution of years of schooling for Jews and Arabs in Israel in the population above the age of 15. The table shows that during the early years of the state, Jews had much more schooling. While half of the Arab population had no schooling at all, only 12.6 percent of the Jews had no schooling. While 10 percent of the Jews had some higher education, only 1.5 percent of Arabs had some. There are two main reasons for these large disparities. First, the Jewish community had already developed a strong education system under the British Mandate, both due to superior social organization and due to the high educational level of immigrants. The Arabs went to Mandatory schools, which were fewer and poorer. Second, many educated Palestinians left in 1948, leaving behind them a more rural, poorer, and less educated population. Things changed after the establishment of Israel, as it built a strong public education system. Even if it discriminated against Arab schools, it still was a huge improvement relative to the Mandatory period.

TABLE 13.2. Distribution of years of schooling for Jews and Arabs, age 15 years and older, selected years (percent)

Group	Jews				Arabs			
YEARS OF SCHOOLING	0	1–8	9–12	13+	0	1–8	9–12	13+
1961	12.6	42.9	34.6	9.9	49.5	41.4	7.6	1.5
1970	9.3	38.0	39.7	13.0	36.1	48.8	13.0	2.1
1980	6.4	25.2	47.6	20.8	18.9	43.9	29.5	7.7

1990	4.2	16.1	51.5	28.2	13.0	37.3	40.6	9.1
2000	2.6	9.4	47.0	41.0	6.5	23.7	48.7	21.0
2010	1.7	5.8	43.3	49.2	5.4	19.8	53.0	21.8
2018	1.0	3.6	39.3	56.0	3.7	15.0	54.9	26.4

Source: Data are from Central Bureau of Statistics (1991, table 22.1; 2001, table 8.1; 2019, table 4.80).

Table 13.2 shows that schooling increased significantly over the years in both groups, but especially among Arabs, due to their low initial conditions. The share of Arabs without any education declined to 3.7 percent in 2018. The rise of higher education among Arabs is impressive as well. In 1961, the share of the highly educated among Jews was six times higher than among Arabs, and this ratio declined to 2 in 2018. Hence, Israeli public education has succeeded in reducing gaps in schooling between Arabs and Jews significantly. However, the gaps are still wide. One possible reason for delays in catching up by Israeli Arabs can be discrimination against Arab municipalities and schools by the government. Strawczynski and Zeira (2003) and Justman and Spivak (2004) present some evidence for such discrimination.

Table 13.2 shows a significant jump in higher education between 1990 and 2000, which I attribute to two causes. First, many immigrants from the ex-Soviet Union came with more education. Second, the government decided in the early 1990s to allow the operation of colleges that can grant B.A. degrees and later even higher degrees. Previously, Israel had only seven universities, which were mainly in the center, three in the Tel Aviv area, one in Jerusalem, two in Haifa, and one in Beer-Sheba. The colleges were distributed around the country and thus reduced the cost of acquiring higher education. Although the jump in higher education among Jews was due to both causes, the large jump in higher education among the Arabs was solely due to these colleges.

TABLE 13.3. Distribution of years of schooling by origin, age 15 years and older (percent)

Years of schooling	0–8	9–12	13+	0–8	9–12	13+
GROUP	BORN IN EUROPE/AMERICA			BORN IN ASIA/AFRICA		
1961	48.5	38.5	12.7	77.7	19.1	3.0
1980	34.2	39.2	26.6	56.2	34.9	8.9
1990	25.3	38.5	36.2	47.2	38.9	13.9
2000	12.8	35.3	51.9	40.0	41.6	18.4
2007	8.8	34.0	57.2	35.3	42.9	21.9
GROUP	FATHER BORN IN EUROPE/AMERICA			FATHER BORN IN ASIA/AFRICA		
1961	15.7	64.5	19.6	60.8	34.5	4.5
1980	5.4	54.1	40.5	19.1	70.3	10.6
1990	2.9	48.0	49.1	9.2	73.2	17.6
2000	2.3	38.8	58.9	5.9	62.6	31.5
2007	1.7	35.1	63.1	4.9	55.3	39.8

Source: Data are from Central Bureau of Statistics (1981, table 22.1; 1991, table 22.2; 2001, table 8.2; 2008, table 8.4).

Table 13.3 presents the distribution of years of schooling for Jews according to origin, both in the first and in the second generation.[10] As the table shows, the gaps in 1961 were very large. They have shrunk over the years but have not yet fully closed. Interestingly, this holds for those born in Israel, who acquired their education in Israel. In 1961, the share of highly educated

individuals, whose father was born in Europe/America, was four times larger than the share of higher education among those whose father came from Asia/Africa. Over the years, the gaps decreased, and in 2007, the ratio between these two shares was 1.3. This is of course a huge improvement, but the gaps are still significant.

However, the current situation might be better than what table 13.3 shows, since it reports on the entire population, including older people, who grew up when barriers to education were greater. To get a more updated picture, I searched the 2011 income survey for data on Israelis of the age 30–40, who grew up with tuition-free high schools and with public colleges. There are gaps in schooling even in this group. The share of high school education only among Jews whose father was from Asia/Africa was 39 percent, while the share among Jews whose father was from Europe/America was only 18 percent. The share of those with 16 years of education or more among Jews whose father is from Asia/Africa, was 34 percent, compared with 55 percent among Jews whose father is from Europe/America. This is a significant gap.

Tables 13.2 and 13.3 show that there are still gaps in schooling between the groups, mainly between Arabs and Jews and to some extent between Mizrahi and Ashkenazi Jews. These education gaps explain part of the income gaps between groups shown in table 13.1. Part-time work can also explain wage gaps, especially between men and women. However, to examine whether these are the only causes for income gaps, appendix 9 shows the results of additional wage regressions for the various groups, while controlling for years of schooling, for age, and for part-time work.

We first examine the wage gap between men and women in Israel, which happens to be one of the highest in the OECD countries. According to the OECD, the gender gap in Israel in 2018 was 22.7 percent, while the average gender gap in the OECD was only 12.9 percent. Only two countries had higher gender gaps than Israel: Korea with 32 percent and Japan with 23.4 percent.[11] Hence, this is an important issue to examine. Indeed, appendix 9 shows that wages of women are lower by 21 percent than those of men with the same education, age, and part-time work. Appendix 9 shows that the gap is larger for women with lower education and reaches 27 percent. This implies that women suffer from direct or indirect discrimination in the labor market. One form of this discrimination is that professions that are largely dominated by women, like teachers, nurses, or social workers, earn very low wages.

Appendix 9 finds that wages of Arabs are lower by 18 percent from those of Jews with the same education, age, and part-time work. Unlike women, educated Arabs fare worst, and their accumulated return to education is lower by 14 percent, which accounts for most of the gap. One explanation for this finding is that educated Arabs face difficulties in finding jobs that fit their education, as many firms, which have defense contracts, avoid hiring Arabs. As a result, many educated Arabs turn to teaching jobs, which pay low wages, as indicated by Gara and Cohen (2001). Bar and Zussman (2017) present another form of discrimination against Arabs, showing that many Israelis prefer not to buy services from companies that employ Arabs.

As for Ultra-Orthodox men, appendix 9 shows that their wages are low because they do not reflect their long years of schooling in yeshivas. Their accumulated return to education is very low, at the level of 6 years of regular schooling. This implies that the yeshiva studies of Ultra-Orthodox men do not properly prepare them for the labor market in Israel. This finding has a broader implication: We should be careful not to always identify human capital with years of schooling, as the content of education is important as well.

We next turn to wage gaps between Mizrahi and Ashkenazi Jews and focus on the second

generation, born in Israel. Appendix 9 shows that wages of Jews born to fathers from Asia/Africa are 10 percent lower than wages of Jews born to fathers from Europe/America, after controlling for schooling, age, and part-time work. This finding points to some discrimination in the labor market. Rubinstein and Brenner (2014) further support this conclusion. They examine sons of mixed couples, comparing sons of Mizrahi mothers to those of Mizrahi fathers and show that it is harder for the latter to find jobs. They show that the difference is because employers can identify sons of Mizrahi fathers by their last names.

The wage regressions in appendix 9 also show that wages of immigrants from the ex-Soviet Union were lower by 23 percent than the wages of Israeli Jews with same schooling and age, in 2011. This fits the Kuznets effect, described in chapter 3, that immigrants suffer a large decline in their human capital on arrival to a new country. While studies show that in most other immigrations, immigrants regained their human capital within 20 years, this did not happen for Russian immigrants to Israel. It is hard to explain this finding.

Market and Disposable Income: The Effect of Government

Many Israelis claim that high inequality is due mainly to two groups, the Ultra-Orthodox and the Arabs. The two communities have low human capital. The Arabs have low schooling and the Ultra-Orthodox have few secular studies in their schools. The two groups also work less. Ultra-Orthodox men stay many years in yeshivas, and Arab women work less, due to patriarchal traditions. This is a nice explanation, but it is incorrect. If it were true, Israel would have high inequality of market income, as human capital and labor participation affect such income. However, the Gini coefficient of market income in Israel is 0.44, while the average Gini coefficient of market income in the OECD countries is higher at 0.47. In contrast, it is the Gini of disposable income in Israel, which is high relative to the average in OECD countries: 0.346 relative to 0.317. Hence, the main reason for high inequality in Israel is the mechanism of redistribution of market income to disposable income through direct taxes and welfare subsidies.

Figure 13.4 describes the Gini coefficients of market income and disposable income in Israel in the years 1979–2018.[12] Data are missing for 1986–1987 and 2000–2001, so the figure fills these missing years by averaging between the years before and after. As both direct taxes and welfare subsidies are progressive (namely, they reduce income of rich by more than income of poor), the Gini coefficient of disposable income is below the Gini coefficient of market income. Figure 13.4 also presents the difference between the two Gini coefficients, which is a crude measure for the degree of redistribution by the government through direct taxes and subsidies. The solid curve in the figure represents the Gini of market income, the dashed curve is the Gini of disposable income, and the dotted curve is the difference between the two.

Figure 13.4 shows that inequality of market income increased until 2000 and has declined since then. The difference between the two Gini coefficients has decreased since the 1990s. Next, let us try to understand the dynamics of these two variables, the Gini of market income and the difference between the two Gini coefficients, which measures government redistribution. The two variables together explain the dynamics of the Gini of disposable income.

Before analyzing the dynamics of inequality of market income in Israel, I describe two global processes that have affected inequality in Western countries and in Israel as well. The first is the rise of information, communication, and computer technologies, which increase returns to education. This widened the wage gap between workers with higher education and those without

it. This process affected Israel as well, especially through the expansion of high-tech industries. A second process that increased inequality of market incomes was globalization. Imports from less-developed countries reduced demand for traditional industries, which led to many job losses in these industries and to a decline in wages. As chapter 11 shows, Israel went through a significant globalization, which also should have increased inequality.[13] One form of globalization are foreign workers, who are extensively employed in some industries and services, earn very low wages, and push down domestic wages, especially on the lower rungs of the wage ladder. As figure 13.3 shows, the share of foreign workers in Israel increased steadily until 2000.

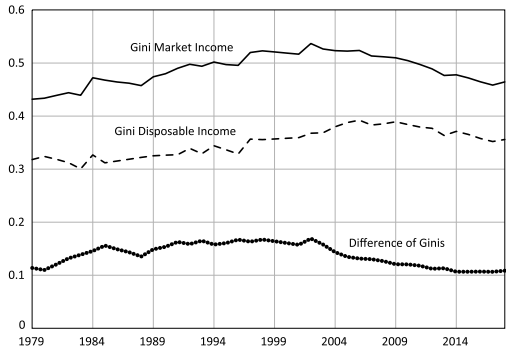

FIGURE 13.4. Gini coefficients of market and disposable incomes, 1979–2018.
Data are from National Insurance Institute (2003, 2019).

However, to understand the decline of inequality of market income after 2000, we need to look at two Israeli processes. The first is the continuous expansion of education, which accelerated after the introduction of public colleges in the 1990s. Usually, a transition from less to more schooling increases inequality at first and then reduces it. The reason is simple. Consider a population with mainly high school education as higher education begins to expand. The addition of college and university graduates increases inequality. However, at some point, inequality should begin to fall, since by the end of the process, with higher education available to all, incomes should be equal again. This is the famous inverted-U curve of Kuznets (1955), except that he described transition from agriculture to industry, while here, the transition is from low to higher education. The path of inequality is similar. Indeed, figure 13.4 exhibits such dynamics exactly. Inequality initially increased, and then it declined beginning in 2000, just as the Kuznets curve predicts.

The second process that affected market income inequality was increased participation in the labor force. According to some economists, the main cause for this higher participation was the reduction in welfare subsidies in 2003–2004, when Netanyahu served as the minister of finance. According to this claim, the cuts induced many poor individuals to move "from welfare to work," as in the United States a decade earlier. However, a simple calculation shows that this mechanism could not reduce the Gini coefficient of market income by much.

My calculation uses the distribution of market income in 2002, on the eve of the cuts, and estimates the change due to increased labor force participation. According to table 2.5 in chapter 2, participation increased by less than a tenth following the cuts in welfare, and some of it was not from welfare to work. However, the calculation assumes that a tenth of the population shifted from welfare to labor. Thus, it raises income of the bottom decile of the population, who earned 0.0 percent of total income in 2002, to income of the next decile after the change, which is

grossly exaggerated. Recalculation of the Gini coefficient for the new distribution reduces it by 1.4 percentage points. Since the Gini of market income declined by 7.3 percentage points after 2002, the increased participation can account for at most one-fifth of the decline in the Gini coefficient. The rest is due to the expansion of education.

The decline of the Gini coefficient of market income since 2000 is important, but it did not fully pass through to the Gini of disposable income, as figure 13.4 shows. This is because the difference between the two Gini coefficients is declining. Thus, redistribution by the government has continuously weakened. I claim that this is the result of the ongoing decline of public expenditures as a share of GDP. In other words, it is a result of the neoliberal policies in Israel in recent decades.

Public expenditures affect redistribution through two channels. First, increased spending requires higher taxes, including direct taxes. Second, a government that has a larger public sector spends more in all areas, including welfare. Both direct taxes and subsidies redistribute income, being progressive. In Israel, income tax is quite progressive. The bottom 50 percent of workers pay less than 4 percent of their income, and most pay zero. The marginal rates rise through 10, 14, 21, 31, 34, 48, and 50 percent. The top marginal rate of 50 percent begins at seven times the average wage. However, overall direct taxes are less progressive than in other countries, due to low taxes to NII (social security), to low corporate tax rate at 23 percent, and due to low tax rates on income from capital, which are flat rates between 15 and 30 percent for various assets.[14]

The effect of the size of the public sector on redistribution is clearly shown in an international comparison. Figure 13.5 presents a scatter diagram of thirty OECD countries, where the horizontal axis is public expenditures in percent of GDP, while the vertical axis is the difference between the Gini coefficient of market income and that of disposable income for each country. The data are from 2015–2016 and do not cover all OECD countries for lack of updated data on public expenditures. The figure shows a strong positive correlation between public expenditures and redistribution.

Figure 13.5 shows that Israel has low redistribution not only due to its low public expenditures but also due to other reasons, as Israel lies below the main correlation between the two variables. A possible explanation is that the tax system in Israel is regressive, as direct taxes in Israel are lower than in other OECD countries, as shown in chapter 12. Figure 13.5 suggests graphically the correlation between the two variables, but a recent, more thorough study by Battisti and Zeira (2015) confirms this correlation. It shows that if public expenditures rise by 10 percent of GDP, the Gini coefficient of disposable income declines by 4 percentage points. Hence, neoliberal policies indeed increase inequality, as both international data and the Israeli experience show.

Israel not only has high inequality compared to other developed countries, but it also has a very high rate of poverty as well. According to the OECD, the recent poverty rate in Israel is 17.9 percent, which is the highest in the group. Below it are the United States (17.8 percent poverty rate), South Korea (17.4 percent), and Turkey (17.2 percent). Why does Israel have such a high rate of poverty? A common explanation blames the high rate mainly on the two poorest populations, Arabs and Ultra-Orthodox Jews. Netanyahu even said once that without these two groups, the economy of Israel would be fine and its poverty rate low. However, the economist Momi Dahan examined this claim and found that even without these two groups, the poverty rate is still high.[15]

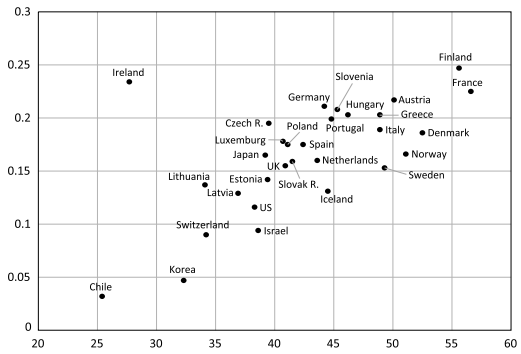

FIGURE 13.5. Public expenditures (percent of GDP) and difference between Gini coefficients of market and disposable Gini in OECD countries, 2015–2016.
Data are from OECD, income distribution data base, https://stats.oecd.org/Index.aspx?DataSetCode=IDD, accessed on December 22, 2019.

Focusing on specific groups in the population is important, as it highlights the problems of insufficient education for Ultra-Orthodox Jews and discrimination against Arabs, but it ignores the role of economic policy, which is crucial to understanding poverty in Israel. Figure 13.6 presents a scatter plot of OECD countries in 2016, where the horizontal axis is public expenditures in percentage of GDP, and the vertical axis is the rate of poverty. The figure shows that there is a strong negative correlation between the two variables, namely, reducing public expenditures raises poverty. Furthermore, Battisti and Zeira (2015) show that welfare subsidies have the largest impact on the rate of poverty. Raising them by 1 percent of GDP reduces the poverty rate by 1.6 percent.

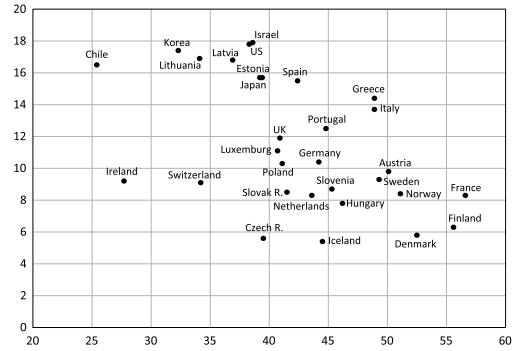

FIGURE 13.6. Public expenditures and poverty rates (in percent) in OECD countries, 2016.
Data are from OECD, https://data.oecd.org/inequality/poverty-rate.htm, accessed on January 8, 2020.

Hence, the high rate of poverty in Israel reflects the low public expenditures and mainly the low welfare subsidies. Many observers claim that reducing subsidies contributes to poverty alleviation, as it pushes the poor to go to work. I think this claim is too narrow. It ignores the effects of welfare subsidies on the education of the next generation. A single mother with two or three kids, who has to work many hours, might neglect her children, who will fail in school and might even resort to criminal behavior. Heller (2019) shows that the reduction of income support subsidies in 2003 reduced later educational achievements of children from families who experienced this reduction.

The Two Hands of the Government

People tease economists for always saying "on one hand … but on the other hand.…" This time the two hands belong to the government. As this chapter shows, the government affects inequality on one hand by its neoliberal policies (which increase inequality), and on the other hand by its expansion of education, especially higher education (which has reduced inequality after 2000). I attribute this reduction to the government, as most education in Israel is public. The few private colleges are located near the center of the country and hence do not account for the reduction of inequality, which is a result of the ability to study on the periphery, close to home, with lower costs.

But the fact that the government initiated the college revolution in the 1990s does not necessarily keep it from eroding. Chapter 12 shows that expenditures on education remain constant relative to GDP, but as these expenditures are meant to finance more years of schooling, the support for public education is in fact eroding. Recently, the government has been pushing to expand studies geared to the high-tech sector, but this focus might come at the expense of other types of education. Hence, the decline in inequality of market income, shown earlier in this chapter, might reflect mainly past expansion of education and might even disappear in the future.

The other hand of the government, which is its neoliberal policies, raises inequality significantly. These policies include cuts in direct taxes, cuts in welfare transfers, privatization of many public services, weakening of labor unions, and globalization of both goods and labor. Chapter 12 and this chapter outline the Israeli experience with such neoliberal policies and show how they raise inequality. Hence, the effect of government on inequality is complex and might sometimes work in opposite directions. This should not surprise us, as governments are complex entities. However, the analysis shows that the overall effect of the government on inequality is to raise it, and if education expenditures do not increase, this effect might strengthen.

1. There is some reverse causality as well. People who inherit larger wealth can purchase better education and have higher incomes (Galor and Zeira 1993). In addition, economists have found that the rate of return of wealthy people is higher than the rate of return of others (Yitzhaki 1987). However, the main causality goes from income to wealth.

2. A quick search shows how vast this research is. The pioneers of the area are Loury (1981), Galor and Zeira (1993), Banerjee and Newman (1993), Alesina and Rodrik (1994), Persson and Tabellini (1994), and Barro (2000).

3. See Galor and Zeira (1993) and Banerjee and Newman (1993) for this intergenerational effect.

4. See the discussion of public education in chapter 12.

5. For the analysis of this effect, see Zeira (1998) and Acemoglu (2010).

6. See Bank of Israel (2019c), table 2.A.15.

7. In addition to output of the business sector, total output includes also output of the public sector and an estimate of the value of housing services. Both have serious measurement issues, as explained in chapter 3.

8. The data on foreign workers do not include African refugees from Sudan and Eritrea, who entered Israel illegally.

9. According to Caselli (2005), which summarizes many international studies, between 0 and 4 years of schooling, each additional year raises wages by 13 percent; between 4 and 8 years, each additional year raises wages by 10 percent; and above 8 years of schooling, each additional year raises wages by 7 percent.

10. The Central Bureau of Statistics stopped publishing data on origin in 2007.

11. See See OECD (2020), accessed on October 6, 2020.

12. NII calculates Gini coefficients based on income surveys, which underreport income from capital and wealth. Hence, actual inequality should be higher. This is true for most countries. Atkinson, Piketty, and Saez (2011) began to add data from tax authorities to fix this problem. Israel still needs such research.

13. Helpman (2018) shows that the effect of globalization on inequality in developed countries was small.

14. Chief Economist (2017), table 7.1.

15. This exchange was reported by Merav Arlozorov in the daily *De Marker* (Haaretz) on April 12, 2012.

Lessons from Part IV

This final part of the book looks at a fascinating economic "natural experiment" and draws some conclusions from it. I view the implementation of neoliberal policies in Israel as a natural experiment for two reasons. The first is the exogenous event of the peace with Egypt, which reduced significantly defense-related costs and enabled implementing many neoliberal policies, like a sharp reduction of taxes. The second reason relates to differences between Israel and other countries, which is the lack of serious opposition to neoliberalism in Israel, due to the special history of its labor movement, as described in this book. The neoliberal policies were all-encompassing. Public expenditures declined from 80 percent of GDP to less than 40 percent. The government cut direct taxes significantly in the late 1980s and in 2007–2008, but during other periods as well. The government privatized, or outsourced, a significant part of public services. Its policies also reduced the power of labor unions, which helped lower wages, mainly after 2000.

Part IV identifies two important effects of this experiment in neoliberal policies. First, it had no effect whatsoever on economic performance, namely, on economic growth. While growing fast during the catching up until 1973, afterward Israel grew at a stable rate. Actually, economic growth even declined slightly after 1993, due to entry of ex-Soviet Union immigrants to the labor market. However, that is a well-known phenomenon, as immigrants lose much of their productivity upon arrival in their new country. Hence, the neoliberal policies had no significant effect on economic growth, which is an important lesson from this natural experiment.

This part also finds that the neoliberal policies raised inequality in Israel significantly. Globalization, privatization of public services and weakening the labor unions contributed to inequality of market income. However, it was mainly lowering direct taxes and reducing welfare subsidies, which weakened the redistribution effect of government and contributed significantly to the rise of inequality of disposable income. Although the expansion of education reduced inequality of market income after 2000, and so counteracted to some degree the neoliberal policies, their effect was still sufficiently strong. It made Israel one of the most unequal countries in the OECD, and the country with the highest poverty rate.

Conclusion

FOUR DECISIONS, TWO DILEMMAS, AND ONE PANDEMIC

It is hard to summarize a book on something that has not ended and is still evolving and developing, like the Israeli economy. Hence, instead of a formal summary, I will go over four important decisions in the history of Israel, which had the greatest impact on the economy. Interestingly, these decisions were not only economic. Understanding these decisions and their impact can help us understand what we can learn from the Israeli economy in general.

The first decision was signing the Reparations Agreement with West Germany in 1952 and its implementation since 1953. The person who was instrumental in making this decision was David Ben-Gurion, the leader of the Zionist movement since the early 1930s and the first prime minister of Israel.[1] This was not an easy decision. Israel signed the agreement only 7 years after the Holocaust, and people understood it as the beginning of the rehabilitation for Germany.[2] The decision faced fierce opposition, and some of the demonstrations near the Knesset against the agreement were violent. However, Ben-Gurion prevailed, and the decision enabled Israel to continue its rapid economic growth for the following 20 years. As chapter 2 describes, Israel financed its economic growth throughout most of its history by trade deficits, namely, by funds from abroad. During the Mandatory period, this was possible thanks to the influx of wealth from immigrants. However, those immigrants who arrived after the founding of the state in 1948 were penniless, arriving either from the refugee camps across Europe or from the Arab countries, from where they were not allowed to bring their wealth.

Initially, in 1949–1951, Israel succeeded in continuing its rapid growth, by applying a policy of Tzena (austerity), namely, rationing of consumption. However, the policy could not last long, and soon enough the black market expanded and put this policy at risk. Consequently, the government reduced its investment in 1952 significantly, and the country experienced a severe recession. It seemed as if the rapid growth of the previous 30 years was going to stop. The Reparations Agreement with West Germany renewed foreign finance to Israel and enabled it to return to fast economic growth, financed by a large trade deficit. Hence, this decision was crucial to the economy, as it enabled growth to continue for the next 20 years and for Israel to catch up with the global frontier.

After the Six Day War in early June 1967, Israel found itself controlling wide swaths of new territory. These were the Sinai Peninsula of Egypt, the Golan Heights of Syria, and the West Bank and the Gaza Strip, previously held by Jordan and Egypt, respectively, but which were actually Palestinian territories. Following this occupation, Israel made an informal decision to stay in these territories as long as it could. The result of this decision was an intensification of the Israeli-Arab conflict, as Egypt and Syria put military pressure on Israel to withdraw from these territories. This pressure included the War of Attrition in the years 1968–1970 and the Yom Kippur War in 1973. Since these were conventional wars, they were very costly and had a great

fiscal effect, as described in chapter 5.

The conflict increased not only military costs, but interest payments as well, due to the high deficit and the ensuing large debt. It also increased subsidies to the business sector, which suffered from the extensive service required from Israeli military reservists. Hence, public expenditures rose to more than 75 percent of GDP and the public deficit to around 15 percent of GDP. As a result, public debt rose to more than 150 percent of GDP in 1985. Another outcome was an accelerating inflation, as the central bank financed part of the deficit by printing money, as described in chapter 9. This fiscal crisis was a direct result of the 1967 implicit decision to keep control of the territories. As Defense Minister Moshe Dayan said in 1969, in 1971, and again 1973: "It is better to have Sharem-a-Sheich without peace, than to have peace without Sharem-a-Sheich."[3]

However, in 1977 Menachem Begin nominated Moshe Dayan to be his foreign minister. This time Dayan changed his mind, probably after the Yom Kippur War. Now he preferred peace to holding Sinai, and he helped move Israel and Egypt to reach a peace agreement. In 1979, the two countries signed the agreement, in which Israel agreed to evacuate all of the Sinai Peninsula in exchange for peace. This agreement changed the Israeli-Arab conflict dramatically, since it significantly reduced the possibility of a conventional war between Israel and its neighbors. As a result, military and other conflict-related costs declined sharply relative to GDP, as discussed in chapter 5. This enabled the stabilization of the economy in 1985 and ended the fiscal crisis. Hence, the peace with Egypt is the third decision that had a profound effect on the Israeli economy.

The peace with Egypt and the ensuing stabilization enabled Israel to reduce its conflict-related costs significantly. This freed up significant resources, and all the governments since 1985 decided to use these resources to lower taxes, mainly direct taxes. They did not use them to increase other social services, such as education, health, housing, and welfare. The result was a gradual reduction of public expenditures relative to GDP and a gradual erosion of public services. In 2003 the government passed a spending rule law, which formalized this policy legally, as shown in chapter 12.

These accumulated decisions of all governments since 1985, to reduce the public sector relative to GDP, constitute the fourth important decision in our list. Although it was not a one-time decision, but an accumulation of many decisions, we can view them in a broad time perspective as a single major decision. Together with the reduction of the power of labor unions and with the extensive privatization of public services, it created a neoliberal transition of the economy. As chapter 13 shows, this decision had a powerful effect on inequality. It reduced the share of labor in national income, and it reduced significantly the public redistribution of income through direct taxes and transfers. This policy not only raised income inequality, it also increased inequality of actual standards of living, since by eroding public services it hurt those who need public services most, namely, those with lower incomes.

The book therefore highlights four major decisions in the history of Israel that had profound effects on its economy. These decisions affected Israel's rapid economic growth in the early period, led to the fiscal crisis in the 1970s and to its end in the 1980s, and they subsequently led to rising inequality.

Understanding these past decisions leads us to consider two dilemmas that Israel is facing today. The first dilemma is whether to continue to "manage" the Israeli-Arab conflict, or to reach a political agreement. The second dilemma is whether to continue the neoliberal policies, or to

change direction and improve the situation of the lower classes at the expense of higher taxes on the rich.

In both dilemmas, the leadership of Israel has made an implicit decision to keep the status quo and not change direction. However, the role of an observer is to point out the alternatives to the current policies and their benefits and costs. As chapter 6 shows, the economic cost of continuing the Israeli-Arab conflict is very high. But a peace with the Palestinians (and following it with the other Arab countries, according to the Arab Peace Initiative) requires a high territorial price of returning to the 1967 borders with relatively small changes.

Finally, finishing this book in 2020, I cannot ignore the coronavirus pandemic and the deep recession it has ignited. Although it is too early to analyze it, we can already examine how past economic policies have affected the ability of Israel to cope with the pandemic and with its dire economic consequences. Here, my main observation is that the many years of decline of the public sector and its privatization significantly damaged the ability of the government to cope with the pandemic and the deep recession. Here I present a few examples to support this claim.

First, Israeli neoliberalism not only kept public services low, but it also did not adjust them fully to changes in demography and in technology. For example, the number of Intensive Care Unit (ICU) beds in Israeli hospitals was 84 beds per million in 2019. The number of such beds in Italy was 83 per million, but France and Germany had 380 ICU beds per million. When the coronavirus hit, parts of the Italian medical system collapsed. Israel had to adopt an extreme lockdown, which caused great economic damage, to avoid a similar collapse of its health system. Later, it went through a second and a third lockdown, due to the same fear of collapse of the medical system.

The government found it hard to recruit its forces to fight the pandemic and resorted too fast to privatization as a solution to every problem. It privatized purchasing required medical equipment, laboratories for tests, nomination of an outside head of the campaign against the Covid-19 pandemic, and more. The result was a devastating failure. The equipment purchased cost much, and much of it was not adequate. Problems with testing abounded throughout the pandemic. Creation of a unit that tests and tracks contacts stalled for too long. The public sector failed to form a coherent policy, and the politicians changed policies often. The only success was the fast and efficient vaccination of the population in late 2020 and early 2021. This success is due mainly to the Israeli health funds, a unique institution that has roots in the labor union and functions very well, as described in chapter 12.

The steps taken to reduce the recession were also partial and not very effective. Unemployment benefits in Israel were too low, so they did not sufficiently help the many people left without work. Welfare payments were too low to support people, who need to stay at home with their children. At some point, the government realized this, but instead of raising the compensation for economic losses, it decided to give a fixed amount to each citizen. This is clearly inefficient. Such failures show that after many years of weakening the public sector, both through fiscal restraint and through privatization, it became so weak that the government could not effectively activate it. This is tragic, since a pandemic and a severe recession are exactly the situations with widespread market failures, when the need for state intervention is acute. Yet the state proved helpless.

Another negative effect of the long years of neoliberal policies has been the erosion of solidarity in Israel. When public services decline, people feel betrayed by the state and by society as well. When leaders continuously praise success in business to justify privatizations, they

contribute to unconstrained admiration of those who succeed over others who cannot. That also weakens solidarity. Israel, which enjoyed high solidarity in the past due to its many years of conflict, has lost it almost completely. This has proved to be very problematic nowadays. You cannot beat a pandemic without solidarity, when you need to wear an itchy mask to protect others. You cannot fight a recession without solidarity, if you have to tax the richer to compensate those who have suffered most.

This book tells a story of a great economic success. Israel has developed from a poor country in the less-developed Middle East to one of the thirty richest countries in the world. During its development, it succeeded in not only growing but also in ending its fiscal crisis by achieving peace with Egypt, and it succeeded in balancing its foreign trade after many years of having a deficit. However, this great success is marred by two main problems. One is the economic cost of the Israeli-Arab conflict, which is quite high, around 30 percent of GDP. The second problem is high inequality, which tears the society apart, as it overlaps with Israel's ethnic divisions. Hence, this book is a story of success and costs.

1. Nahum Goldman, a prominent Zionist leader, played an important role in negotiating and promoting the agreement. However, he did not live in Israel at the time, and his role in passing the decision in Israel was small.

2. Indeed, Israel signed full diplomatic relations with West Germany as early as 1965.

3. Sharem-a-Sheich is the southernmost tip of the Sinai Peninsula. It controls ship movements in the Red Sea. For the declaration in 1969, see the daily, *Maariv*, June 27, 1969, and for the declaration in 1971, see *Maariv*, April 14, 1971. The third declaration was during a lecture in Tel Aviv in June 15, 1973, 4 months before the Yom Kippur War.

APPENDIXES

Appendix 1. Labor-Augmenting Total Factor Productivity

This appendix shows how to measure changes in the production function that are not changes in the two main factors of production, labor and capital. It also shows how these changes affect GDP in equilibrium. Let us make two main assumptions. The first is that productivity can be captured by a single variable, *A*, called "total factor productivity" (TFP). The second assumption is that this productivity is labor augmenting, namely, a rise by 1 percent in productivity is equivalent to a rise of 1 percent in labor. The following equation embodies these two assumptions:

$$Y = F(K, AL). \qquad (1.1)$$

The variable *Y* is output, *K* is capital and *L* is labor. Assume that the production function *F* is constant over time and that all changes in the production function are in *A*. Call *A* the "labor-augmenting total factor productivity" (LATFP).

I first describe how to calculate changes in *A*, as in "growth accounting." The full difference in output as a function of its three variables (labor, capital, and productivity) is:

$$\Delta Y = F_K \Delta K + F_L(A\Delta L + L\Delta A) = MPK\Delta K + MPL\Delta L + (LMP$$

We use $MPL = AF_L$. By dividing (1.2) by *Y*, we get that the rate of growth of output is:

$$\frac{\Delta Y}{Y} = \frac{KMPK}{Y}\frac{\Delta K}{K} + \frac{LMPL}{Y}\frac{\Delta L}{L} + \frac{LMPL}{Y}\frac{\Delta A}{A}. \qquad (1.3)$$

Note that $KMPK / Y = \eta_K$, namely, η_K is the elasticity of output with respect to capital. In a perfect competition equilibrium, this elasticity should be equal to the share of capital in output. Similarly: $LMPL / Y = \eta_L$, namely, the elasticity of output with respect to labor, which is also equal in equilibrium to the share of labor in output. Due to constant returns to scale, the sum of the two elasticities should be equal to 1. Hence:

$$\frac{\Delta Y}{Y} = (1-\eta_L)\frac{\Delta K}{K} + \eta_L\frac{\Delta L}{L} + \eta_L\frac{\Delta A}{A}. \qquad (1.4)$$

From this identity we derive the rate of growth of productivity. It is equal to

$$\frac{\Delta A}{A} \;=\; \frac{1}{\eta_L}\left(\frac{\Delta Y}{Y} \;-\; \frac{\Delta K}{K}\right) \;+\; \frac{\Delta K}{K} \;-\; \frac{\Delta L}{L}. \qquad (1.5)$$

Hence, if we have data on the growth of output *Y*, of labor *L*, of capital *K*, and on the elasticity of output with respect to labor, we can calculate the rate of change of productivity.

$$y \;=\; \frac{Y}{L} \;=\; F\left(\frac{K}{L},\, A\right) \;=\; F(k,\; A).$$

Empirical calculations of the rate of growth of TFP show that it is positive and quite large, which means that it explains a large part of output growth. To calculate the direct effect of productivity growth on output per worker, note first that output per worker is equal to:

Output per worker therefore depends on productivity and on the capital-labor ratio *k*. The absolute change in output per worker is:

$$\Delta y \;=\; F_K \Delta k \;+\; F_L \Delta A.$$

Let us use it to calculate the rate of growth of output per worker:

$$\frac{\Delta y}{y} \;=\; F_K \frac{\Delta k}{k}\frac{k}{y} \;+\; F_L \frac{\Delta A}{A}\frac{A}{y} \;=\; \frac{F_K K}{Y}\frac{\Delta k}{k} \;+\; \frac{F_L (AL)}{Y}\frac{\Delta A}{A} \;=\; \eta_K \frac{\Delta k}{k}$$

This equation describes the effects of productivity and of capital deepening, namely, the increase in the capital labor ratio *k*. Since the elasticity of output with respect to labor is usually around 2/3, (1.6) implies that the direct effect of productivity growth is 2/3.

However, productivity also has an indirect effect on output in equilibrium through capital accumulation. Higher productivity raises the marginal productivity of capital, *MPK*, and that increases the incentive to invest, which increases capital and so increases output as well. To measure the direct and the indirect effects combined, we apply the following equilibrium condition:

$$MPK = r + d + p. \qquad (1.7)$$

The marginal productivity of capital *MPK* is the gross return on capital, *r* is the real interest rate, *d* is the rate of depreciation, and *p* is the risk premium of investors. The sum *r* + *d* + *p* is the marginal cost of capital, while *MPK* is its marginal benefit. They should be equal in equilibrium. Applying this equilibrium condition to labor-augmenting productivity, we get:

$$r \;+\; d \;+\; p \;=\; MPK \;=\; F_K(K, AL) \;=\; F_K\left(\frac{K}{AL},\, 1\right) \;=\; F_K(z, 1). \qquad (1.8$$

The derivation of (1.8) uses the result that the first derivative of a constant returns to scale production function is homogenous of degree 0. Equation (1.8) implies that the ratio between *k*

and *A*, which I denote by *z*, depends only on the cost of capital.

Next let us substitute the equilibrium value of the capital labor ratio in the production function to get the equilibrium level of output per worker:

$$y_t \;=\; F(k_t,\; A_t) \;=\; F(zA_t,\; A_t) \;=\; A_t F(z,\; 1). \qquad (1.9)$$

Hence, output per worker is proportional to productivity, so the combined direct and indirect effect is 1. Thus, if the cost of capital is stable, growth in productivity accounts for all economic growth per worker. Actually, the cost of capital is quite stable if the economy is open to capital mobility. The rate of depreciation is a technological parameter, of around 8–10 percent, the global interest rate is quite stable at 2–3 percent, and the risk premium should also not change much. Hence, productivity can account for all economic growth in open economies. Indeed, in chapter 3 we saw that the equilibrium value of output per worker described by (1.9) is proportional to the actual level of output per worker over time (as their logarithm curves are parallel). It implies that the theoretical result (1.9) fits the Israeli data well.

Let us next examine the equilibrium level of wages in this economy, which is relevant to the discussion of wages in chapter 13. In perfect competition, the (real) wage is equal to the marginal productivity of labor, so:

$$w_t \;=\; A_t F_L(K_t, A_t L_t) \;=\; A F_L\left(\frac{K_t}{A_t L_t},\; 1\right) \;=\; A_t F_L(z,\; 1). \qquad (1.10)$$

The variable *z* is described by equation (1.8) and is constant if the cost of capital is constant. Due to equations (1.9) and (1.10), we see that both output per worker and the wage are proportional to LATFP, that is, to A_t. More precisely, we get:

$$w_t \;=\; \frac{F_L(z,\,1)}{F(z,\,1)} y_t. \qquad (1.11)$$

Hence, if the cost of capital is constant, as should be the case in an open economy, the wage should be proportional to output per worker over time. Note that $w_t / y_t = w_t L_t / Y_t$, which is the share of labor in total output. Hence, if productivity is labor augmenting and if there is perfect competition, the share of labor in output should be constant over time. This fits international data as well. Chapter 13 examines this relationship using Israeli data.

Appendix 2. Human Capital

In this appendix, we decompose the black box of productivity to human capital and all the rest. Here, LATFP is the following multiple, $A \;=\; B\bar{h}$, where $\bar{h}$ is average human capital in the economy, and *B* is all that is left of productivity, such as technology. Let us now model such a decomposition. Assume that there are many workers in the economy, and each has a different level of human capital. The aggregate production is:

$$Y \;=\; F[K,\; B(h_1 l_1 \;+\; h_2 l_2 \;+\; \cdots \;+\; h_n l_n)]. \qquad (2.1)$$

Here h_j is the human capital of worker *j*, and l_j is the amount of labor (hours) he/she works. The hourly real wage of worker *j* is equal to her marginal productivity:

$$w_j \;=\; \frac{\partial Y}{\partial l_j} \;=\; F_L[K,\; B(h_1 l_1 \;+\; \ldots \;+\; h_n l_n)]Bh_j \;=\; \overline{w}\, h_j. \qquad (2.2)$$

Hence, the wage of worker *j* is proportional to her human capital, as $\overline{w}$ depends on the economy and not on each worker *j*. This result enables us to calculate the human capital of workers according to their years of schooling, by using results from wage regressions. This can be done because wages and human capital are proportional, so they change in the same proportion for each year of schooling. We usually normalize human capital of a worker with zero schooling to 1.

Next, I show that only average human capital affects aggregate output. From equation (2.1) we get that if *L* is aggregate labor, then $L = l_1 + l_2 + \ldots + l_n$, and output is:

$$\begin{aligned} Y \;&=\; F[K,\; B(h_1 l_1 \;+\; h_2 l_2 \;+\; \ldots \;+\; h_n l_n)] \\ &=\; F\left[K,\; BL\tfrac{h_1 l_1 \;+\; \ldots \;+\; h_n l_n}{L}\right] \;=\; F(K,\; B\bar{h}L). \qquad (2.3) \end{aligned}$$

The average human capital $\bar{h}$ is therefore part of the LATFP. Note that in this case, there is also an indirect effect on human capital, through physical investment, as in appendix 1. The equilibrium condition determines a unique ratio *z*:

$$r \;+\; d \;+\; p \;=\; MPK \;=\; F_K(K, B\bar{h}L) \;=\; F_K\left(\frac{K}{B\bar{h}L}, 1\right) \;=\; F_K(z,\, 1).$$

Hence: $K = B\bar{h}Lz$. If we substitute this in the production function (2.3), we get:

$$Y \;=\; F(B\bar{h}Lz,\; B\bar{h}L) \;=\; B\bar{h}LF(z,\; 1). \qquad (2.5)$$

Dividing by labor yields the following output per worker:

$$y \;=\; \frac{Y}{L} \;=\; B\bar{h}F(z, 1). \qquad (2.6)$$

Note that *z* depends only on the cost of capital and on the production function *F*. Hence, output per worker is proportional to average human capital if we take together its direct and indirect effects. We use this result to calculate the contribution of education to growth in chapter 3, and to calculate the cost of conscription in chapter 6.

Appendix 3. Capital-Output Ratio and Labor Productivity

Chapter 4 shows that the capital-output ratio in Israel is lower than in other countries, especially compared to that in the United States. We next examine what is the effect of this finding and

what can explain it. To analyze it, assume for simplicity a specific production function, namely, the Cobb-Douglas function. Output with labor-augmenting productivity in this function is:

$$Y = K^{\alpha}(AL)^{1-\alpha}. \qquad (3.1)$$

According to this production function, output per worker is equal to:

$$y = \frac{Y}{L} = \frac{K^{\alpha}A^{1-\alpha}L^{1-\alpha}}{L} = A\left(\frac{K}{AL}\right)^{\alpha}. \qquad (3.2)$$

We can also calculate the ratio of capital to output in this production function to get:

$$\frac{K}{Y} = \frac{K}{K^{\alpha}A^{1-\alpha}L^{1-\alpha}} = \left(\frac{K}{AL}\right)^{1-\alpha}. \qquad (3.3)$$

Substituting (3.3) into equation (3.2), we get:

$$y = A\left(\frac{K}{AL}\right)^{\alpha} = A\left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}}. \qquad (3.4)$$

This equation enables us to calculate the difference in labor productivity that fits a certain difference in the capital-output ratio.

Assume for simplicity that the United States and Israel share the same productivity, namely, the same *A*. We see in chapter 4 that the US business sector capital output ratio is around 1.6, while in Israel, it is only around 1. Following the common assumption that α = 1/3, we get that output per worker in the United States should be 26 percent higher than in Israel. Thus, labor productivity in Israel is 21 percent lower than in the United States, as implied by its lower capital output ratio.

We next examine the reasons for a low capital output ratio in Israel. The equilibrium condition that determines the quantity of capital is:

$$r + d + p = MPK = \alpha K^{\alpha-1}(AL)^{1-\alpha} = \frac{\alpha}{\left(\frac{K}{AL}\right)^{1-\alpha}}. \qquad (3.5)$$

From this equilibrium condition, we get:

$$\left(\frac{K}{AL}\right)^{1-\alpha} = \frac{\alpha}{r+d+p}. \qquad (3.6)$$

Hence, the capital output ratio is equal to:

$$\frac{K}{Y} = \frac{K}{K^{\alpha}A^{1-\alpha}L^{1-\alpha}} = \left(\frac{K}{AL}\right)^{1-\alpha} = \frac{\alpha}{r+d+p}. \qquad (3.7)$$

Since α is fairly constant across countries and is equal to 1/3, equation (3.7) implies that Israel and the United States differ in their cost of capital. It is equal to 33 percent in Israel and only to 21 percent in the United States. The difference cannot be in *r*, as the two countries face the same global capital market, and it cannot be *d*, which is a technical parameter, usually between 8 to 10 percent. Hence, it must be due to a high risk premium *p*. Note that to justify the difference in the cost of capital and assuming that *r* + *d* in both countries should be around 12 percent, the risk premium in Israel should be around 21 percent, while in the United States it should be 8 percent. This is a big difference of 13 percentage points.

One of the main claims made in Israel is that labor productivity is low due to high regulation and bureaucracy costs. Such barriers usually make investment more costly. To evaluate this claim, we examine a more realistic model with adjustment costs to investment. As is usually assumed, the adjustment costs to investment are quadratic, where the parameter *m* is inversely related to the costs, and it should be interpreted as an inverse measure to regulation and bureaucracy costs:

$$adjustment\ costs = \frac{1}{2m}\frac{\left[K(t+1)-K(t)\right]^2}{K(t)}. \qquad (3.8)$$

Battisti, Di Vaio, and Zeira (2020) solve such a model and show that if *g* is the long-run rate of growth of productivity, and if *n* is the long-run rate of growth of the labor force or of population, then the steady state capital output ratio is equal to:

$$\frac{K}{Y} = \frac{\alpha}{r + d + p + (g + n)\frac{r-(g+n)/2}{m}}. \qquad (3.9)$$

In Israel, the sum *g* + *n* is around 0.035, which is the average rate of growth of GDP. Assuming that the real interest rate is 3 percent, we get:

$$(g + n)\frac{r - (g + n)/2}{m} = \frac{0.000438}{m}. \qquad (3.10)$$

We cannot measure *m* directly but can roughly estimate its size. In equilibrium, the rate of growth of capital is equal to $m(q-1)$, where *q* is the well-known Tobin's *q*, which fluctuates around 1, somewhere between 0 and 2 or 2.5. This enables us to put a lower bound on *m*, at 0.03. In this case the amount in (3.10), which is the addition to the cost of capital, should be lower than 2 percentage points. This is much lower than the 13 percentage points needed to account for the higher cost of capital in Israel relative to the United States. Hence, the main difference is still the risk premium. We should also examine whether the difference between the two countries is a result of different values of *n*, due to higher population growth in Israel (1.9 percent annually) than in the United States (1 percent annually). Applying the two values to (3.10) shows that the

difference in population growth can account at most for 0.2 percentage points in the cost of capital. Hence, this also cannot account for the gap in labor productivity between the two countries.

Appendix 4. Dynamic Tests of Rates of Unemployment

This appendix presents results of regression tests of the rate of unemployment on itself with a lag of 1 year. These are tests of the following auto-regressive dynamic equation, where U_t is the rate of unemployment in year t, B is the coefficient of the rate of unemployment in a lag, A is the constant and v_t is the residual:

$$U_t = A + B \cdot U_{t-1} + v_t. \qquad (4.1)$$

This dynamic relation leads to convergence to a long-run average rate of unemployment, which we equate with the natural rate of unemployment. This long-run rate is derived from (4.1) by calculating the unconditional expectation of unemployment, which is:

$$U_N = \frac{A}{1-B}. \qquad (4.2)$$

Using (4.1) and (4.2) we can rewrite the dynamic condition in a slightly different way:

$$U_t - U_N = B \cdot (U_{t-1} - U_N) + v_t. \qquad (4.3)$$

Thus, the deviation of unemployment from the natural rate declines by $1 - B$ every year. Hence, $1 - B$ measures how fast unemployment returns to the natural rate after it is hit by a shock.

According to (4.1), there is a single natural rate of unemployment over the entire period. Chapter 7 raises the possibility of a change in the natural rate of unemployment once or even twice. To examine it, the regressions add dummy variables for the suspected periods of change, of value 1 during the change period and 0 outside it. The variable D is equal to 1 in 1980–2018 and 0 elsewhere. For testing a second break in 2003, D_1 is equal to 1 in 1980–2003 and 0 elsewhere, while D_2 is equal to 1 in 2004–2018 and 0 elsewhere. For testing a second break in 2014, D_1 is equal to 1 in 1980–2013, and D_2 is equal to 1 in 2014–2018. The dynamic test for the hypothesis that there was only one change in the natural rate is:

$$U_t = A + B \cdot U_{t-1} + C \cdot D_t + v_t. \qquad (4.4)$$

The dynamic test for two changes of the natural rate is:

$$U_t = A + B \cdot U_{t-1} + C_1 \cdot D_{1t} + C_2 \cdot D_{2t} + v_t. \qquad (4.5)$$

Table A.1 presents the results of the regressions. The first column examines the possibility of one change in the natural rate in 1980. Columns (4) and (5) test (4.1) in the sub-periods 1949–1979 and 1980–2018. Column (2) tests the possibility of two changes in the natural rate of unemployment, in 1980 and in 2014, while column (3) tests change in 2004.

TABLE A.1. Dynamic regressions of the rate of unemployment, 1949–2018

Coefficient	1949–2018 One change: 1980 (1)	1949–2018 Two changes: 1980 and 2014 (2)	1949–2018 Two changes: 1980 and 2004 (3)	1949–1979 (4)	1980–2018 (5)
B	.78***	.75***	.76***	.73***	.85***
	(.06)	(.06)	(.06)	(.09)	(.08)
A	.94***	1.09***	1.04***	1.22**	1.10**
	(.42)	(.42)	(.41)	(.61)	(.58)
C	.71***				
	(.42)				
C_1		.89***	1.09***		
		(.32)	(.34)		
C_2		−.22	.12		
		(.59)	(.39)		
U_N 1949–1979	4.2	4.4	4.3	4.5	
U_N 1980–2018	7.4				7.5
U_N 1980–2013		8.0			
U_N 2014–2018		3.5			
U_N 1980–2003			8.9		
U_N 2004–2018			4.8		
Adj. R^2	0.75	0.76	0.77	0.68	0.76
Number of observations	69	69	69	30	39

Note: The number in parentheses is the standard deviation; * indicates significance of 10 percent, ** indicates significance of 5 percent, and *** indicates significance of 1 percent.

The results shown in table A.1 strongly support the hypothesis that the natural rate of unemployment increased after 1980. From a level around 4.4 percent before 1980, it increased to a level of 7.5 after 1980. The regressions show that there has been a second change in the natural rate of unemployment, but this result is not significant statistically. Adding the possibility of a second change in the natural rate increases the R^2 of the regression from 0.75 to 0.76 or even 0.77, but that increase is small. We can therefore conclude that there are some signs of a recent decline of the natural rate of unemployment, but we have not gathered enough data for enough years to have a significant result. Table A.1 shows that the return of the rate of unemployment to the natural rate is quite fast. According to equation (4.3) and to the results of table A.1, the deviation of the rate of unemployment from the natural rate declines every year by 25 percent. It declined even faster before 1980, by 27 percent, and a bit slower after 1980, by 15 percent annually.

Appendix 5. Empirical Tests of the Balance of Payments in Israel

This appendix presents regressions that examine the effect of some explanatory variables on foreign deficits in Israel. There are two explained variables: one is the trade deficit (TD), which includes income flows. The second is the current account deficit (CAD). The two variables are in percent of GDP, as in the figures in chapter 8. The explanatory variables in all regressions reflect the intertemporal approach to the balance of payments. The first is long-term growth rate, denoted by GROWTH, which is 5 in 1952–1972 and 1.8 in 1973–2018. These are the long-term growth rates of GDP per capita in Israel in these years. The second variable is the proportion of immigrants in the population, denoted by IMM and calculated as the ratio between the number of

immigrants who arrived in the last five years, and the population at the beginning of the year. The third variable is direct defense spending in percent of GDP, denoted by DEFENSE. The fourth variable is the unilateral transfers to Israel in percent of GDP, denoted by TRANSFERS. In some regressions, there is an additional explanatory variable, the one-year lagged deficit (LAG), to address auto-correlation.

Table A.2 summarizes the results of the regressions. Regression (1) examines the effects of the various variables on the trade deficit and shows that the effects are in the directions predicted by the theory. The effect of growth on the deficit is positive, as are the effects of immigration waves, of war expenses, and of unilateral transfers. Note that an increase of $1 in transfers increases the trade deficit by 60 cents, namely, people expected the transfers to decline. The regression residuals of (1) reveal a serial correlation, as the Durbin-Watson statistic shows. Hence, regression (2) adds a one-year lag of the deficit (longer lags were insignificant). Indeed, adding the lag improves the regression results and resolves the serial correlation problem.

Regressions (3) and (4) examine the effect of the explanatory variables on the current account deficit. The results of these regressions are also in line with the theory of the intertemporal approach to the balance of payments. Particularly interesting is the negative impact of transfers, which reduces the current account deficit by a quarter. Hence, the prediction that the public anticipated a decline in US aid over time and did not consume all of it, is confirmed by the regressions on the current account, just as it is confirmed by the regressions on the trade deficit.

TABLE A.2. Balance of payments and explanatory variables, 1952–2018

Regression Dependent Variable	(1) TD	(2) TD	(3) CAD	(4) CAD
Growth	1.79*** (.35)	1.00*** (.32)	1.18*** (.38)	.89*** (.37)
IMM	.31*** (.08)	.20** (.10)	.28*** (0.09)	.26*** (.11)
Defense	.78*** (.09)	.47*** (.10)	0.79*** (0.10)	.61*** (.12)
Transfers	.59*** (.11)	.33*** (.11)	−0.24** (0.12)	−.26** (.12)
Lag of dependent variable		.44*** (.08)		.32*** (.11)
Constant	−10.41*** (1.20)	−6.50*** (1.25)	−7.96*** (1.27)	−5.9*** (1.45)
Adjusted R^2	0.89	0.93	0.63	0.67
D.W.	1.15	1.76	1.15	1.54
Number of observations	67	66	67	66

Note: The number in parentheses is the standard deviation, * indicates significance of 10 percent, ** indicates significance of 5 percent, while *** indicates significance of 1 percent. D.W., Durbin-Watson statistic.

Finally, it is possible to use regression (2) with the lag to derive the long-term effect of the explanatory variables. Assuming that the trade deficit is constant over time, $TD_t = TD_{t-1}$, one gets:

$$TD = -11.64 + 1.78 \cdot GROWTH + 0.36 \cdot IMM + 0.84 \cdot DEFENSE + 0.58 \cdot TRANFERS. \quad (5.1)$$

Interestingly, the long-term coefficients are very similar to those of regression (1). Using the long-term regression formula, one can substitute the values of the explanatory variables in the early years of the state and examine the size of the trade deficit then, as implied by the theory. Substituting a growth rate of 5, immigration rate of 20 percent, defense costs of 7 percent, and transfers of 18 percent, we get a trade deficit of 22 percent of GDP, which is similar to the actual deficit in that period. If we plug in the values of the explanatory variables today, which are growth of 1.8, immigration of 1.5 percent, defense costs of 6 percent, and transfers of 3 percent, we get a trade surplus of 1 percent of GDP, which fits well the situation today. It therefore follows that the deficit in the early years was not at all chronic, but instead was a result of high growth, wars, waves of immigration, and transfers from foreign governments.

Appendix 6. Inflation Tax

The amount lost by the public due to inflation, through erosion of value of money, is equal to what the central bank and commercial banks gain from inflation. Denote the rate of inflation in period 1 by $\widehat{P}$:[1]

$$\widehat{P} = \frac{P_1 - P_0}{P_0}.$$

If the public holds M_0 money in period 0, it loses the following real value:

$$\frac{M_0}{P_0} - \frac{M_0}{P_1} = \frac{M_0}{P_0} - \frac{M_0}{P_0(1 + \widehat{P})} = \frac{M_0}{P_0}\frac{\widehat{P}}{1 + \hat{p}}. \qquad (6.1)$$

The central bank, which creates high-powered money *H*, increases it by the same rate as the inflation rate. The real value of the additional money created, which is the gain of the central bank, is equal to:

$$\frac{H_1 - H_0}{P_1} = \frac{H_0(1 + \widehat{P}) - H_0}{P_1} = \frac{H_0}{P_0}\frac{\widehat{P}}{1 + \widehat{P}}. \qquad (6.2)$$

The gains of the central bank are smaller than what the public pays, as (6.2) is smaller than (6.1), since high-powered money is only part of total money. Thus, commercial banks gain as well. They gain because of their checking accounts or demand deposits *D*. This is a liability of the commercial banks, and inflation erodes this liability, so these banks gain. The erosion is of the deposits minus the reserves *R*, held by the commercial bank in the central bank. Hence, the total gains of commercial banks from inflation are:

$$\frac{D_0 - R_0}{P_0} - \frac{D_0 - R_0}{P_1} = \frac{D_0 - R_0}{P_0} - \frac{D_0 - R_0}{P_0(1 + \widehat{P})} = \frac{D_0 - R_0}{P_0}\frac{\widehat{P}}{1 + \widehat{P}}$$

Total money is equal to cash plus demand deposits: $M_0 = C_0 + D_0$. The high-powered money

is cash plus reserves of banks in the central bank, namely: $H_0 = C_0 + R_0$. Hence, we get:

$$\frac{M_0}{P_0}\frac{\widehat{P}}{1+\widehat{P}} = \frac{C_0+R_0}{P_0}\frac{\widehat{P}}{1+\widehat{P}} + \frac{D_0-R_0}{P_0}\frac{\widehat{P}}{1+\widehat{P}} = \frac{H_0}{P_0}\frac{\widehat{P}}{1+\widehat{P}}$$

Hence, the losses of the public from holding money are equal to the revenues from the inflation tax by the central bank and the gains from inflation by commercial banks.

Appendix 7. The Phillips Curve

Here I present a simple model of the Phillips curve. Let us begin with the standard assumption of the Phillips curve, that the change of nominal wages depends negatively on the rate of unemployment, or more precisely on the difference between the actual rate of unemployment and the natural rate of unemployment, which is the rate of unemployment when the labor market is in equilibrium. Let us also assume, like Friedman (1968) and Phelps (1967), that wages depend also on expected inflation, as workers care about their real wages. Finally, assume that the change of wages depends on past inflation, as some of the wage compensates for past inflation as well. We get:

$$\widehat{W} = a\widehat{P}_{-1} + (1-a)\widehat{P}^{e} - b(U-U_N). \qquad (7.1)$$

In (7.1), U is the rate of unemployment, U_N is the natural rate of unemployment, a is a measure for the sluggishness in adjusting wages to inflation, and b is the slope of the Phillips curve.

Prices themselves depend on wages, through the supply of goods, and on monetary policy, through the demand for goods. Since Israel at the time had a managed exchange rate, I present monetary policy here by the exchange rate. Hence, the rate of inflation is:

$$\widehat{P} = c\widehat{W} + (1-c)\widehat{E}. \qquad (7.2)$$

Substituting the wage equation (7.1) in the pricing equation (7.2), we get:

$$\widehat{P} = ca\widehat{P}_{-1} + c(1-a)\widehat{P}^{e} - cb(U-U_N) + (1-c)\widehat{E}. \qquad (7.3)$$

Next, let us impose the assumption of rational expectations, namely that $\widehat{P} = \widehat{P}^{e}$, to get the following equation:

$$\widehat{P} = \frac{ca}{1-c+ca}\widehat{P}_{-1} + \frac{1-c}{1-c+ca}\widehat{E} - \frac{cb}{1-c+ca}cb(U-U_N)$$

Hence, equilibrium inflation depends positively on inflation with a lag (namely, there is inertia of inflation), positively on the rate of devaluation, and negatively on unemployment.

At a steady state, when inflation is stable over time and when it is also equal to the rate of devaluation, (7.4) implies that $U - U_N = 0$, which means that unemployment is at the natural rate.

This is why the natural rate of unemployment is also called the nonaccelerating inflation rate of unemployment (NAIRU). Hence, it fits the claim that in the long run, there is no trade-off between inflation and unemployment.

To examine the dynamics of inflation, let us calculate the change in inflation over time:

$$\widehat{P} - \widehat{P}_{-1} = \frac{1 - c}{1 - c + ca}(\widehat{E} - \widehat{P}_{-1}) - \frac{cb}{1 - c + ca}cb\,(U - U_N).$$

Hence, the change in inflation depends on the rate of unemployment and on the rate of real devaluation. When unemployment is high, there is pressure on wages, so inflation declines. Similarly, if the rate of devaluation falls relative to past inflation, it also pushes inflation down, from the demand side.

Appendix 8. The Dynamics of Public Debt-to-GDP Ratio

Denote the nominal public debt in period *t* by D_t and the nominal deficit in period *t* by DEF_t. Then the change in debt over time is:

$$D_t = D_{t-1} + DEF_t. \qquad (8.1)$$

To find the debt-to-GDP ratio, divide each side of the equation by nominal output to get:

$$\frac{D_t}{P_tY_t} = \frac{D_{t-1}}{P_tY_t} + \frac{DEF_t}{P_tY_t} = \frac{D_{t-1}}{P_{t-1}Y_{t-1}}\frac{P_{t-1}Y_{t-1}}{P_tY_t} + \frac{DEF_t}{P_tY_t}. \qquad (8.2)$$

Next, denote the debt-to-GDP ratio by *d* and the deficit-to-GDP ratio by *def*. Then it is possible to rewrite (8.2) in the following way:

$$d_t = d_{t-1}\frac{P_{t-1}Y_{t-1}}{P_tY_t} + def_t. \qquad (8.3)$$

If we denote the rate of growth of nominal output by g_t, we can rewrite (8.3) as:

$$d_t = d_{t-1}\frac{1}{1 + g_t} + def_t. \qquad (8.4)$$

Assume next that the nominal growth rate g_t is constant over time and positive. Denote it by *g*. Assume also that the deficit is a constant share of GDP, denoted *def*. Then (8.4) describes a first-order difference equation, which converges to a constant level of debt-to-output ratio, *d*, which is equal to:

$$d = def\,\frac{1 + g}{g}. \qquad (8.5)$$

The average rate of growth of real GDP in Israel is 3.5 percent, and inflation is on average

1.5 percent, although the inflation target is an annual rate of 2 percent. Hence, the rate of growth of nominal GDP, *g*, is 5 percent. Thus, for Israel, (8.5) can be written as:

$$d = def \cdot 21. \qquad (8.6)$$

This equation implies that since the deficit was for a long time equal on average to 3 percent of GDP, then the debt-to-GDP ratio should have converged to 63 percent. This is indeed very close to the actual debt in 2018, which was 61 percent of GDP. Furthermore, (8.6) implies that if the debt target is 60 percent of GDP, then the long-run deficit target should be 2.86 percent of GDP. Similarly, if the debt target is 50 percent of GDP, as set in 2014, then the deficit target should be 2.4 percent of GDP.

Appendix 9. Wage Regressions

This appendix presents wage regressions on the Income Survey of 2011 (Central Bureau of Statistics, 2011a). The wage regressions below report on employees only and not on the unemployed or self-employed, in order to focus on the effect of various variables on wages. The dependent variable in all regressions is the natural logarithm of wage. The Central Bureau of Statistics supplies weights to the different observations to make the sample representative. The wage regressions below use these weights. However, running the regressions without the weights has yielded very similar results, since the sample is quite big and quite representative. Table A.3 presents the basic regressions, where each column adds a variable. In all the regressions in this appendix, the standard deviations are robust.

TABLE A.3. Basic wage regressions on 2011 data

Explanatory variable	(1)	(2)	(3)	(4)	(5)
Years of schooling	.073*** (.002)	.075*** (.002)	.077*** (.002)	.084*** (.002)	.119*** (.009)
Years of schooling squared					−.001*** (.0003)
Age		.100*** (.004)	.066*** (.004)	.054*** (.004)	.055*** (.004)
Age squared		−.001*** (.00005)	−.0007*** (.00004)	−.0005*** (.00004)	−.0005*** (.00004)
Part-time work			−.892*** (.015)	−.689*** (.015)	−.685*** (.015)
Monthly workdays				.051*** (.002)	.051*** (.002)
Constant	7.732*** (.029)	5.525*** (.097)	6.344*** (.085)	5.384*** (.088)	5.117*** (.104)
R^2	0.101	0.150	0.364	0.426	0.428
Number of observations	14,887	14,887	14,887	14,887	14,887

Note: The number in parentheses is the standard deviation, * indicates significance of 10 percent, ** indicates significance of 5 percent, while *** indicates significance of 1 percent.

Regression (1) examines the effect of years of schooling only and finds that each year increases the wage by 7.5 percent. This result is close to results obtained both in other countries and earlier in Israel, as in Frisch (2008). Regression (2) adds the age, as a measure for experience in the labor market and for moving between jobs. It finds that age has a positive effect on wages,

this effect is concave and reaches a maximum at the age of 48, and adding it to the regression does not change the effect of schooling. Regression (3) adds part-time work, namely, a variable of 1 for part-time workers and 0 for full-time workers. Its effect is negative, and adding it increases significantly the R^2 of the regression, without changing much the effect of schooling. Regression (4) adds the number workdays in a month, and each such day increases the wage by 5 percent, which is the share of such a day in a month. Hence, this variable reflects the wage per day effect, and its addition to the regression does not change much the effects of schooling and age.

Regression (5) adds the square of years of schooling, to examine the possibility that marginal productivity of schooling is diminishing, as shown by many international studies. Regression (5) indeed shows that this is the case in Israel as well. Note that adding the square of years of schooling does not change the effects of age, of part-time work, and of workdays in a month. But it shows that while the return to the first year of schooling is 12.5 percent, it diminishes to 9.5 by the end of high school and is equal to 8.4 percent after 15 years of schooling. Regression (5) is the basis for all the following regressions, which test different groups in the population.

TABLE A.4. Wage regressions for women, Arabs, and yeshiva graduates

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	.125*** (.009)	.121*** (.008)	.111*** (.009)	.115*** (.009)	.158*** (.007)	.125*** (.008)
Schooling squared	−.001*** (.0003)	−.001*** (.0003)	−.001*** (.0003)	−.001*** (.0003)	−.002*** (.0002)	−.001*** (.0002)
Age	.062*** (.004)	.062*** (.004)	.055*** (.004)	.055*** (.004)	.055*** (.004)	.054*** (.004)
Age squared	−.0006*** (.00004)	−.0006*** (.00004)	−.0005*** (.00004)	−.0005*** (.00004)	−.0005*** (.00004)	−.0005*** (.00004)
Part-time work	−.613*** (.015)	−.612*** (.015)	−.676*** (.015)	−.674*** (.015)	−.684*** (.015)	−.684*** (.015)
Monthly workdays	.050*** (.002)	.050*** (.002)	.053*** (.002)	.053*** (.002)	.052*** (.002)	.053*** (.002)
Women	−.229*** (.010)	−.32*** (.045)				
Women schooling		.006** (.003)				
Arabs			−.200*** (.014)	−.057 (.054)		
Arabs schooling				−.011*** (.004)		
Yeshiva					−.493*** (.049)	.698*** (.168)
Yeshiva schooling						−.069*** (.009)
Constant	5.054*** (.105)	5.101*** (.106)	5.193*** (.104)	5.155*** (.107)	4.749*** (.101)	4.977*** (.105)
R^2	0.4472	0.4474	.4341	0.4343	0.4381	0.4403
Number of observations	14,887	14,887	14,887	14,887	14,726	14,726

Note: The number in parentheses is the standard deviation, * indicates significance of 10 percent, ** indicates significance of 5 percent, while *** indicates significance of 1 percent.

Table A.4 adds to the basic wage regressions the separate effects on three populations: women, Arabs, and Haredi men (whom the data identify as graduates of yeshivas). Note that in

all regressions, the basic coefficients from table A.3 do not change much. Regression (1) shows that controlling for all the basic variables (years of schooling, age, and part-time work), women earn 20 percent less than men do. Regression (2) adds interaction between women and years of schooling and finds that the return to education for women is slightly higher than for men, by 0.6 percent, but women with low education fare much worse than women with education do. This implies that most of the gender discrimination in the labor market is directed toward less-educated women.

TABLE A.5. Wage regressions for Jews by origin

Explanatory variable	(1)	(2)	(3)
Years of schooling	.121*** (.009)	.121*** (.009)	.118*** (.009)
Years of schooling squared	−.001*** (.0003)	−.001*** (.0003)	−.001*** (.0003)
Age	.054*** (.004)	.055*** (.004)	.052*** (.004)
Age squared	−.0005*** (.00004)	−.0005*** (.00004)	−.0005*** (.00004)
Part-time work	−.717*** (.016)	−.720*** (.016)	−.714*** (.016)
Monthly workdays	.056*** (.002)	.056*** (.002)	.055*** (.002)
Born in Europe/America	−.233*** (.012)	−.034 (.023)	
Ex-Soviet Union immigrants		−.262*** (.025)	
Born in Asia/Africa	−.116*** (.016)	−.117*** (.021)	
Father from Europe/America			.192*** (.017)
Father from Asia/Africa			.077*** (.012)
Constant	5.126*** (.115)	5.117*** (.113)	5.148*** (.114)
R^2	0.4439	0.4492	0.4354
Number of observations	13,392	13,392	13,392

Note: The number in parentheses is the standard deviation, * indicates significance of 10 percent, ** indicates significance of 5 percent, while *** indicates significance of 1 percent.

Regression (3) shows that Arabs earn significantly less than Jews do. However, regression (4) shows that most of the wage gap is due to lower returns to education for Arabs. Chapter 13 addresses this finding and attempts to explain it. Regression (5) shows that wages of Haredi men are significantly lower than average wages, by 39 percent. However, regression (6) shows that the main reason for this gap is that the returns to education for Haredi men are significantly lower than the returns for others. In fact, a calculation of their human capital happens to be equal to that of others who finished 6 years of schooling only, although Haredi men have on average 18 years of schooling. Thus, yeshivas give these men a poor preparation for the labor market. Interestingly, regression (6) shows that, taking their low returns to education into consideration, their basic wages are twice as high as the wages of others.

Table A.5 examines differences in wage between Jews from Western countries and Jews from Arab and Muslim countries. The regressions in table A.5 exclude the Arab participants in

the survey. Regression (1) shows that immigrants from Arab countries earn less than the average, even after controlling for years of schooling. Surprisingly, according to regression (1), immigrants from Europe and America earn even less. Regression (2) solves this puzzle by separating immigrants from the ex-Soviet Union since the 1990s from the other immigrants from Europe/America. It shows that those who came from Western countries earn much more than the Russian immigrants do. That is probably due to the Kuznets effect, according to which immigrants lose much of their human capital on arrival. However, it seems that these immigrants did not fully regain their human capital, as their wages are lower by 23 percent given their years of schooling, even in 2011, almost 20 years after their immigration.

Regression (3) in table A.5 shows there are gaps between people born and raised in Israel, according to origin of their parents. Those whose fathers came from Asia or Africa earn 10 percent less than those whose fathers came from Europe or America do. This difference is evident even after controlling for years of schooling and other variables, so it might reflect some discrimination in the labor market.

1. The hat over a variable is a common notation for the rate of change of the variable. See also in appendix 7.

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