Chapter 1
The Economy and Economic Policy in View of Two Global Crises

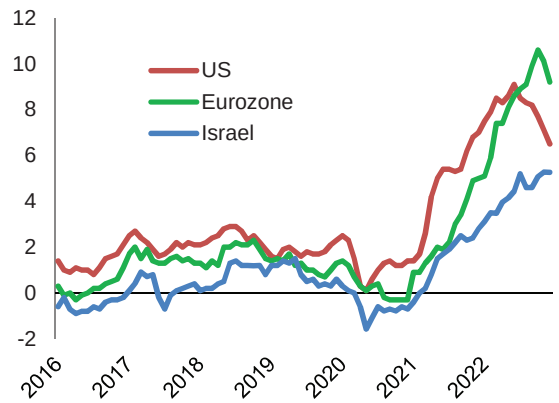
- GDP grew by 6.4 percent in 2022, which was higher than the long-term pace of growth. This followed the high growth rate in 2021, by the end of which the level of GDP had already converged with the precrisis growth trend.
- The labor market continued to tighten in 2022. The job vacancy rate was higher than in the period prior to the COVID-19 crisis, in parallel with an increase in the employment rate and a decline in the unemployment rate.
- Inflation increased during 2022, reaching 5.3 percent at the end of the year. At the beginning of the year, it was mainly influenced by disruptions in international supply due to the COVID-19 crisis and the war between Russia and Ukraine. During the year, high demand made an increasing contribution to inflation.
- Israel enjoys the independence of natural gas production for electricity generation, as well as prices and quantities ensured by long-term contracts. It has therefore been affected only moderately by the global energy crisis that broke out in the wake of the war.
- The shekel depreciated by 4 percent in terms of the nominal-effective exchange rate during the year, with high volatility.
- In the summer of 2021, the Bank of Israel was among the first in the world to stop the use of the monetary accommodation tools that it had used during the COVID-19 crisis. At the beginning of 2022, the Bank also halted its foreign exchange purchases.
- Following the high level of uncertainty that remained at the beginning of 2022 regarding the development of the pandemic and its economic impacts, in April, the Monetary Committee began raising the Bank of Israel interest rate. This followed seven years in which it ranged between 0.1 and 0.25 percent. By the end of the year, the interest rate had reached 3.25 percent, its highest level since the beginning of the previous decade.
- Inflation in most advanced economies was higher than in Israel. In view of the uncertainty at the beginning of 2022 regarding the recovery from the crisis and the impact of the war in Ukraine, the assessments of the major central banks were that inflation was due to temporary supply chain disruptions. As such, they began to raise interest rate only once inflation had increased considerably.
- In view of the increase in interest rates, bond yields increased and share prices declined. Accordingly, in the middle of the year there was a change in direction in the development of credit in all segments, and its growth rate slowed, sharply in some segments.
- Following the COVID-19 years, which featured large fiscal expansion, 2022 ended with a government budget surplus of 0.6 percent, and public debt fell to 60.7 percent of GDP—the environment in which it was prior to the COVID-19 crisis. Among other things, anomalous tax revenues, the delay in public sector wage agreements, and the acceleration of inflation all contributed to this.
- The construction and planning volumes in the housing market continued to increase in 2022, but the number of transactions declined from its 2021 peak. Home prices increased rapidly over most of the year, with the increases slowing toward the end of the year.
- The Israeli high-tech sector grew rapidly in 2022. However, the job vacancy rate in the sector, as well as fundraising by startup companies, declined relative to their peak levels of 2021, and the decline intensified during the year.

1. THE GLOBAL AND ISRAELI ECONOMIES

The most prominent macroeconomic development in the global and Israeli economies in 2022 was the continued increased in inflation.

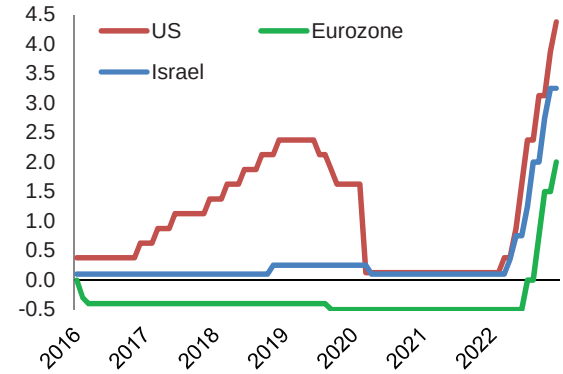
Following more than a decade of near-zero interest rates in view of low inflation, the most prominent macroeconomic development in the Israeli and global economies in 2022 was the continued increase of inflation, which began in 2021 and reached very high levels in 2022 (Figure 1.1). This development was influenced by how global economies exited from the COVID-19 crisis, as well as by the Russia-Ukraine war, and led to a turnaround in the policies of central banks around the world—particularly to sharp interest rate increases (Figure 1.2).

Figure 1.1
Inflation in the Major Economies and in Israel, Past 12 Months, Jan. 2016–Dec. 2022 (percent)



SOURCE: Based on Central Bureau of Statistics and Bloomberg.

Figure 1.2
Central Bank Interest Rates in the Major Economies and in Israel, Jan. 2016–Dec. 2022 (percent)



For the US - the middle of the range between the Federal Reserve's interest rate on loans and its interest rate on deposits.

SOURCE: Bloomberg.

Disruptions in international supply began in 2021 due to COVID-19. There were further disruptions in 2022 due to the war between Russia and Ukraine.

The global recovery from the COVID-19 crisis, which began in the second quarter of 2021, was accompanied by a rapid recovery of global demand—influenced by the removal of COVID-19 restrictions on activity, but also due to the monetary accommodation and fiscal expansion during the pandemic. At the same time, the global economy encountered difficulties in supplying goods to meet demand, due to remaining restrictions on activity, mainly in China, bottlenecks in maritime shipping, and other difficulties that were due to the need for rapid renewal of all economic activity. The global imbalance between the developments of supply and demand was reflected already in 2021 in delays in the supply of raw materials, consumer goods, and final investment products. Shipping disruptions led to sharp price increases in that field.

In February 2022, war broke out between Russia and Ukraine. The war and its effects led to further international supply disruptions in addition to those caused by COVID-19. A coalition of countries, led by the European Union and the United States, imposed economic sanctions on Russia, while Russia reduced the supply of natural gas to Europe and caused difficulties for wheat exports from Ukraine. These factors all had an impact on international shipping and trade, and led to shortages and to sharp increases in commodity prices— chiefly energy products (oil, coal, and natural gas), metals, fertilizers, and food (particularly grains and grain derivatives)—as well as instability in these prices throughout the year.

The interest rate increases in Israel and abroad began due to the continuation and intensification of inflation.

These developments added to the inflationary pressures that began in 2021, and motivated central banks to raise their interest rates following many years of low inflation and near-zero interest rates (Figure 1.2). The interest rate increases in Israel and abroad were preceded by a tapering, and then a complete halt, in the use of special accommodative tools that were used due to the COVID-19 crisis. In the summer of 2021, the Bank of Israel was among the first in the world to stop the use of these tools.[1] The interest rate increases in the advanced economies began only after inflation deviated from the target—in some economies to a significant extent. This can be explained by the high level of uncertainty at the beginning of the year regarding the COVID-19 pandemic, in view of the high morbidity rates at that time (Figure 1.3), the surprise of the war in Ukraine, and the gradual development of the causes for the inflationary outbreak and central bank assessments regarding it. When inflation began increasing in mid-2021, and at the beginning of 2022, most central banks attributed it to the effect of supply constraints that were the result of the COVID-19 crisis and later the war between Russia and Ukraine (even though there were other views, particularly in the US, which attributed the increase in inflation partly to the lagged effect of large fiscal expansion and monetary accommodation measures during the COVID-19 period.) At first, these factors were viewed as limited in duration and intensity. The interest rate increases in Israel and abroad began after inflation continued and intensified. This led to a change in view regarding the nature and persistence of the supply and demand factors that were at its root. The demand factors were prominent due to marcoeconomic activity that featured an accelerated expansion of consumption and a tightening of the labor markets. The latter was reflected in a sharp increase in the job vacancy and employment rates, and a decline in the unemployment rate.

The relatively low exposure of Israeli electricity prices to global energy prices supported the robustness of the Israeli economy during the energy crisis that broke out in 2022 as a result of the war between Russia and Ukraine.

A retrospective at the global crises of the past two decades—from the Global Financial Crisis of 2008, through the 2012 debt crisis, to the COVID-19 crisis and the war in Ukraine—shows that they generally had less of an impact on the Israeli economy than on other advanced economies. Each of these crises has its own story and explanation. In the 2008 and 2012 crises, the relatively small impact to the Israeli economy was partly due to the conservative and stringently supervised banking

[1] See the Bank of Israel's *Monetary Policy Report* for the second half of 2021.

Table 1.1
Main Developments, 2017–22

	2017	2018	2019	2020	2021	2022
Population (yearly average, million)	8.7	8.9	9.1	9.2	9.4	9.6
Nominal GDP (NIS billion, current prices)	1290	1353	1435	1423	1578	1756
Per capita GDP (NIS thousand, current prices)	148	152	159	154	168	184
GDP (real rate of change, percent)	4.3	4.1	4.2	-1.9	8.6	6.4
Private consumption (real rate of change, percent)	3.6	3.6	4.0	-7.9	11.1	7.7
Fixed Capital Formation (real rate of change, percent)	3.4	6.6	3.6	-2.6	12.2	9.6
Public consumption (real rate of change, percent)[a]	3.9	4.0	3.0	2.6	3.7	1.0
Goods and services exports (annual rate of change, percent)[b]	7.0	5.5	5.1	0.2	11.8	8.9
Goods and services imports (annual rate of change, percent)[c]	6.3	5.9	2.7	-7.2	18.2	12.0
Current account of the balance of payments (surplus, $ billion)	13.3	11.2	15.0	22.7	21.4	19.8
Overall government deficit (percent of GDP)	2.3	4.4	4.6	11.5	5.5	1.6
Public debt (percent of GDP)	59.7	59.9	58.8	70.6	67.9	60.7
Employed Israelis aged 15+ (yearly average, thousand)	3825	3905	3967	3913	3957	4187
Nominal wage per employee post (yearly average, percent rate of change)	3.0	3.5	2.9	6.5	2.5	2.9
Unemployment rate, aged 15 and up (yearly average, percent)	4.2	4.0	3.8	4.4	5.0	3.8
Job vacancy rate (yearly average, percent)	3.8	3.7	3.5	2.4	4.5	4.8
Inflation (December compared to the previous December, percent)	0.4	0.8	0.6	-0.7	2.8	5.3
Bank of Israel interest rate (yearly average, percent)	0.1	0.1	0.25	0.1	0.1	1.25
Bank of Israel interest rate (last figure in the year, percent)	0.10	0.25	0.25	0.10	0.10	3.25
Real one-year interest rate (yearly average, percent)	-0.1	-0.8	-0.8	0.1	-1.9	-1.4
Real one-year interest rate (December average, percent)	-0.3	-0.7	-0.7	-0.2	-2.4	1.0
Nominal yield on 10-year government bonds (yearly average, percent)	2.1	2.2	1.6	0.8	1.2	2.6
Real yield on 10-year government bonds (yearly average, percent)	0.6	0.5	0.0	-0.5	-0.8	0.1
Real effective exchange rate (yearly average, percent rate of change)	-4.4	2.1	-2.5	-3.1	-3.9	-0.9
NIS/$ exchange rate (yearly average)	3.6	3.6	3.6	3.4	3.2	3.4
Tel Aviv 125 index[d]	6.4	-2.3	21.3	-3.0	31.1	-11.8
World trade (percent rate of change)	5.7	4.1	0.9	-7.8	10.4	5.4

[a] Excluding defense imports.

[b] Excluding diamonds and startups.

[c] Excluding defense imports, ships, aircraft, and diamonds.

[d] Nominal rate of change - the last day of December compared to the last day of the previous December.

SOURCE: Based on Central Bureau of Statistics and International Monetary Fund.

system, a balanced housing market, and a successful economic policy.[2] During the COVID-19 crisis, the main contributing factors to Israel's success were the structure of the healthcare system, a demographic composition with a younger population than that of other advanced economies, and an industry composition that reduced its exposure to the crisis to some extent.[3] In 2022, during the energy crisis that broke out due to the war in Ukraine, Israel's low exposure to global energy prices for electricity production helped the country's economy.

2. MARCOECONOMIC ACTIVITY IN ISRAEL

a. Main developments

GDP grew by 6.4 percent in 2022, and per capita GDP grew by 4.4 percent (Table 1.1). By the end of 2021, GDP had already crossed the level that would have been expected according to the pre-COVID-19 trend. While GDP growth in 2022 was slower than in 2021, it remained rapid, and was supported by demand for Israeli exports of goods and services. While the level of private consumption as a yearly average remained lower than the pre-COVID-19 trend, it increased rapidly during the year, influenced by the increase in demand as the economic routine stabilized following the COVID-19 crisis. In contrast with Israel, GDP in the US and in Europe (average) remained lower than the pre-COVID-19 trend. The Israeli economy was pre-eminently robust relative to others, during a year of anomalous geopolitical developments, thanks to its lower dependence on the import of energy products for electricity production. This moderated the extent of Israel's exposure to the sharp fluctuations of global energy prices resulting from the war between Russia and Ukraine.

GDP growth was slower in 2022 than in 2021, but it remained rapid.

The rapid recovery of economic activity that began in the second quarter of 2021 continued in 2022 as people got used to living alongside COVID-19. The peak of the fifth wave of COVID-19 morbidity (the "Omicron" variant) was at the beginning of 2022 (Figure 1.3). This wave featured a jump in infection rates, serious morbidity, and mortality, while serious morbidity among vaccinated population groups was relatively low and vaccination was widespread. In view of this, the government chose not to tighten restrictions on activity, in contrast with the policy adopted during the first three waves. Accordingly, there was no need for broad fiscal assistance programs. As early as February, the government began removing COVID-19-related restrictions on activity, and most of them were removed by April. In parallel, the recovery of the labor market that began in 2021 continued, which was partly reflected in an increase in the employment rate (Figure 1.3). As the pandemic wound down, special budgetary support programs were also cancelled, and government expenditures on direct support payments returned to their precrisis rates. Figure 1.4 shows that the rate of those

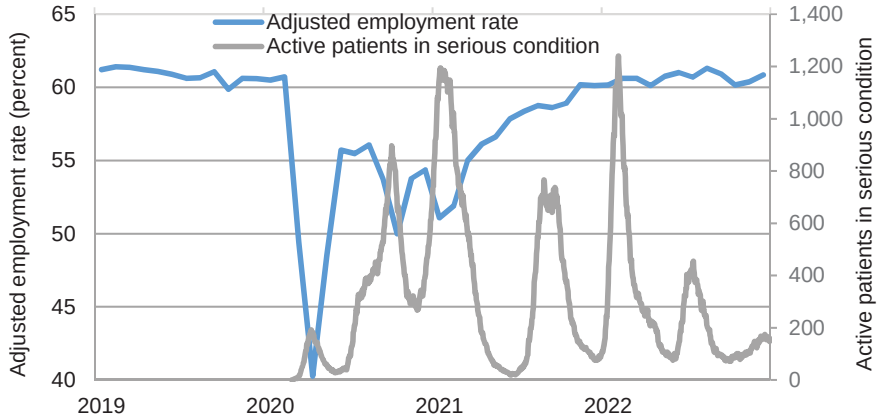
As the COVID-19 pandemic subsided, the special budgetary support was ended and government expenditures on direct support payments returned to their precrisis levels.

[2] For more information, see Bank of Israel (2011), *Israel and the Global Crisis, 2007–2009*; and Bank of Israel (2010), *Annual Report for 2009*.

[3] See Chapters 1 and 2 in the Bank of Israel *Annual Reports* for 2020 and 2021.

working remotely, the expansion of which supported businesses' operations during the crisis despite the restrictions, stabilized from the second quarter of 2022 at a level of about 14 percent of salaried employees (other than a seasonal fluctuation during the summer).[4]

Figure 1.3
Number of Active Patients in Serious Condition, and Adjusted Employment Rate, 2019–2022



The adjusted employment rate relates to those temporarily absent from work for economic reasons, such as the unemployed. It is shown as the quarterly average of monthly data, not seasonally adjusted. Morbidity data relate to the number of active patients in serious condition who are hospitalized.

SOURCE: Based on Central Bureau of Statistics and Ministry of Health.

From February onward, the war between Russia and Ukraine had significant geopolitical effects on the global economy.

Beginning in February, the geopolitical effects of the war in Ukraine were felt in the global economy. One of the main effects was a sharp increase in the global prices of energy products (which declined later in the year), food, and other raw materials. The war's impact on electricity production prices in Israel was limited (as analyzed in Part 4 of this Chapter), but the resulting disruptions did have some impact on Israeli economic activity in other areas. The contraction of Russian chemical exports due to the war led to an increase in global chemical prices and increased Israel's chemical exports. There were other effects due to the jump in oil prices (which declined during the second half of the year) as a result of the sanctions imposed on the exports Russian energy products. As a result, expenditure on the import of energy products increased in 2022, which led to a decline in the current account surplus.

The war in Ukraine led to a flow of refugees and migrants. Some of those came to Israel, and among them were people who were absorbed as immigrants. There were about 74,000 immigrants to Israel in 2022, more than double the number that was expected based on the immigration trend of the decade preceding COVID-19.

[4] The rate of salaried employees aged 25–64 who worked remotely at least 7 hours per week.

The vast majority of immigrants came from Russia, Ukraine, and Belarus.[5] While the absorption of such a large volume of immigrants does not have a macro effect on the labor market[6], it did contribute to increased demand for rental housing, which had already been increasing in recent years.

A number of factors increased demand for rental housing in recent years. These included an increasing need for temporary housing due to urban renewal projects in the central region. Demand for rentals has also been increasing in recent years as an alternative to purchasing a home, due to the increase in home prices. Another reason is the continued increase in the duration of new home construction and the need of those who purchase a home "on paper" to wait until construction is complete (including in government affordable housing programs). Some of those waiting live in rented dwellings in the meantime. Chapter 8, which discusses the housing market, elaborates on these issues.

The number of housing transactions declined sharply in 2022 relative to the previous year (which had an exceedingly high number of transactions), and the decline intensified during the year. Chapter 8 enumerates a number of reasons for the decline in the number of transactions:

- Higher mortgage costs;
- The sharp increase in the number of transactions by investors who wanted to bring their purchases forward to avoid the increase in the purchase tax rate at the end of 2021;
- The end of the "Buyer's Price" program in 2020, which led to a sharp increase in first-time home purchases on the open market in 2021 (by those who had previously waited to win lotteries in the program), and the resumption of lotteries in 2022 (the start of the "Target Price" program), which brought potential purchasers back into a waiting position.

b. Private consumption and savings

Private consumption increased rapidly in 2022, but its annual level was lower than the level that was expected according to the precrisis trend.

The rapid growth of private consumption in 2022, as shown by Table 1.1, is an expression of demand expansion in the economy. The removal of COVID-19 restrictions, which began in the second half of 2021 and expanded in 2022, led to increased demand for consumption, mainly of those services that were restricted during the pandemic. Private consumption therefore grew rapidly in 2022. Despite this, looking at the year as a whole, the level of private consumption was lower than what was expected according to the precrisis trend.

[5] These assessments are based on Central Bureau of Statistics data that appear in "Immigration to Israel 2021 and Immigration to Israel Due to the War in Ukraine, 2022" (Figure 1 and Figure 5), and "Israel's Population at the Beginning of 2023" (Table 3) (in Hebrew).

[6] One-quarter of the immigrants from Russia and Ukraine who immigrated between January and October were children under the age of 18, and about 12 percent were over the age of 66. This means that just two-thirds of these immigrants were of working age. (Source: Eliyahu (2022), "Data on Immigration to Israel from Ukraine and Russia in 2022", Knesset Research and Information Center.)

The relatively low level of private consumption in 2022 can be attributed to two factors—temporary and structural. The temporary factor is shown directly by the data, and attests to the gradual recovery of consumption, particularly of services that involve gatherings—transportation, restaurants, hotels, and art, entertainment and leisure—the consumption of which had been restricted due to COVID-19. Since consumption of these services was restricted at the beginning of the year due to the Omicron variant of COVID-19, the annual consumption of services, and therefore private consumption as a whole, was lower than what would have been expected according to the long-term trend. In this context, tourism services is prominent. Although the consumption of these services grew, it was lower than its pre-COVID-19 level. In particular, the export of tourism services (tourists' consumption in Israel) recovered less than Israelis' consumption abroad.[7]

Another temporary factor that delayed the recovery of consumption is the aggregate supply constraint in view of strong demand for exports that pushed GDP at the end of 2021 beyond the precrisis trend. Another possible explanation for the relatively low level of consumption, despite the rapid growth of demand, has to do with a factor that is structural in nature—changes in consumer preferences and behavior, for instance due to the broad adoption of technological changes. As of now, there are no clear indicators of such changes.

The low level of consumption between 2020 and 2022, and government support of household income during the COVID-19 crisis, increased the rate of savings as a share of disposable private income, particularly in 2020 and 2021 (Box 2.1). This savings rate declined in 2022, but remained slightly higher than in the years prior to COVID-19—potentially influenced in part by the marked increase in the interest rate during the year. As of now, it does not seem that the savings accumulated during the COVID-19 years was used for excess consumption in 2022.

c. The labor market

The labor market continued to tighten in 2022, and converged to a full employment environment.

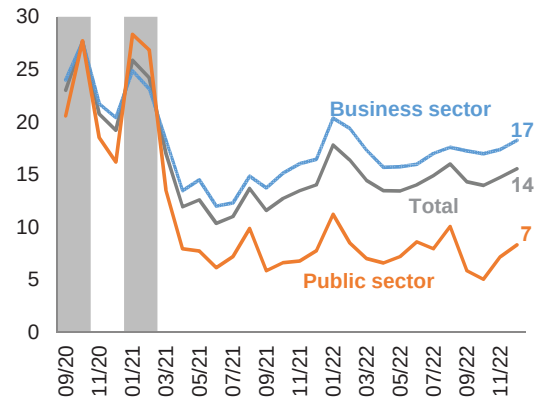
In 2021, when economic activity began to recover and the special assistance to the unemployed was discontinued, employment began to recover. This process continued in 2022 (Figure 1.5), and the expansion of demand in the economy was also reflected in the continued tightening of the labor market, as the annual average job vacancy rate increased, and unemployment declined (Table 1.1). These led the labor market to converge to a full employment environment, with the labor participation rate and the employment rate returning to their 2019 levels (Box 1.1).

The growth of the employment rate in parallel with the increase in the job vacancy rate characterized Israel and many other OECD countries in 2021 and 2022. This was a result of the removal of COVID-19 restrictions, which led to increased demand, due to which many businesses that had reduced their activity went back to hiring workers.

[7] The current account surplus totaled $19.8 billion in 2022—$1.6 billion less than in 2021. The reduction of the surplus was influenced, as stated above, by the increase in oil prices, but also by the fact that outgoing tourism increased more rapidly than incoming tourism.

Figure 1.5 shows that after the employment rate reached its precrisis level, there was some decline in the job vacancy rate, although it remained higher than it was before COVID-19. Box 1.1 analyzes this phenomenon in Israel. In view of the high demand for workers, nominal wages in the business sector increased by 3.9 percent[8], but the increase was not sufficient to compensate for inflation, such that real wages eroded.

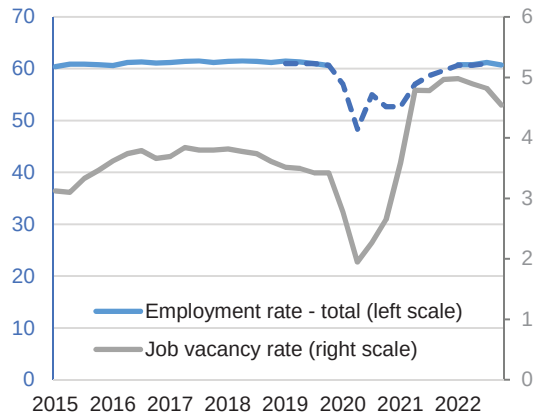
Figure 1.4
Rate of Employees Aged 25–64 Who Integrate Remote Work (percent)



Integrating remote work relates to those who work remotely 7 hours or more per week. The division into public and business sectors is according to the Central Bureau of Statistics definitions. The numeric labels note the averages in the last three quarters of the year. The shaded areas note lockdowns.

SOURCE: Based on Central Bureau of Statistics Labor Force Survey.

Figure 1.5
The Employment Rate and the Job Vacancy Rate, 2015–2022



The broken line shows the adjusted employment rate during the COVID-19 period—the rate minus those absent for economic reasons. The employment rate is for those aged 15 and up.

SOURCE: Central Bureau of Statistics.

Chapter 2 of this Report shows that despite the high demand for workers, and despite the high increase in nominal wages per employee post (Table 1.1), the GDP labor share in the business sector declined in 2022. This is a process that began in 2019, before the outbreak of the COVID-19 crisis, and has continued consistently since then: an increase in the average real wage at a slower pace than the increase in average labor productivity.[9] This is despite the fact that in 2022, average labor productivity also declined, due to a change in the composition of employees that was a feature of the recovery of employment from the COVID-19 crisis. (In 2022,

In view of the high demand for workers, nominal wages in the business sector increased by 3 percent. However, the increase was not sufficient to compensate for inflation, such that real wages eroded.

[8] Nominal wages throughout the economy increased by 2.9 percent, and real wages declined by 1.5 percent (yearly average). Unlike inflation, which is calculated in terms of year-over-year December figures, the change in the average wage presented here is based on the change of the annual monthly average.

[9] The real wage that is relevant to the GDP labor share is the nominal wage minus the Output Price Index (not the Consumer Price Index).

hiring in the industries that were affected by the crisis was predominant. Wages and productivity in these industries are lower than average).[10]

One of the factors affecting the decline of the GDP labor share since 2018 is the development of wages in the government sector, which have an indirect effect on the development of wages in the business sector. Agreements to update wages in the government sector expired in 2018, and due to the COVID-19 crisis, negotiations between the government and the Histadrut to renew them were frozen.[11,12] The previous framework agreement was in force until 2018, and set out additional wage increments for wage creep having to do with tenure or sub-sector agreements in the government sector. The former agreement set out a pace of nominal wage increases that was in line with the low inflation during the period preceding the agreement. Since inflation after that was higher (mostly in the past two years), the average wage in the government sector (which encompasses about 20 percent of salaried positions) eroded not only in relation to business sector wages, but also in terms of purchasing power.

New wage agreements should balance the need to streamline activity in the government sector with maintaining its ability to attract employees.

Beginning in 2017, a gap opened between the two sectors in terms of the pace of wage increases. Wages in the private sector continued to increase in real terms, while real wages in the government sector barely changed. New wage agreements are necessary in order to balance the need to streamline operations in the government sector with the need to maintain its ability to attract appropriate employees.[13,14] The need to hire high-quality workers is particularly prominent when the government sector has to implement technological improvements (a topic discussed in Chapter 6 of this Report) and must hire workers in a competitive market. In the past decade, labor productivity in the private sector has increased rapidly, even compared with other OECD countries, particularly in some of the services industries (as documented and analyzed in Chapter 5 of this Report). Wages in that sector have increased accordingly.

[10] The comparison of wages in industries to the average wage is based on 2019 data. The change in the composition of employees is a technical development that is the opposite of what happened when COVID-19 broke out in 2020, and which then led to an increase in average wages and productivity. Due to the increase in the weight of employees in industries where productivity is relatively low in 2022, the growth rate of real GDP was lower than the growth of labor inputs. Thus, average labor productivity (real GDP per work hour) in the business sector declined by 1.5 percent. This development is anomalous relative to the growth of labor productivity in the business sector in recent years, which was also prominent relative to the other OECD countries (as analyzed in Chapters 2 and 5 of this Report).

[11] In some places, the reference is to the business sector relative to the public sector, and in others the reference is to the private sector relative to the government sector, based on the definitions in the data sources. There is a large overlap between the definitions of the entities belonging to the private or business sector (based on field of economic activity), and in the definitions of entities belonging to the government or public sector (based on how their activities are financed).

[12] An exception in this context is the wage agreement with teachers that was signed in August 2022. The lack of updated wage agreements is one of the reasons for the relatively low growth rate of government expenditure. These two issues are discussed in Chapter 6 of this Report.

[13] Hiring difficulties in the public sector are not reflected in job vacancy data, which relate to the business sector.

[14] At the beginning of March 2023, a new wage agreement was signed. This agreement is expected to narrow the wage gap between the public and business sectors to some extent.

BOX 1.1: DEMAND FOR WORKERS IN 2022

Increase in demand for workers with the exit from the COVID-19 pandemic

The total number of employees and job vacancies is an estimate of aggregate demand for workers in the business sector.[1] This total increased during 2022, thanks to growth in both of its components—the number of employees and the number of job vacancies. According to the estimation, demand in the third quarter of 2021 exceeded the 2019 average, and in the second quarter of 2022, it was in line with the 2015–2019 trend (Figure 1).[2] The job vacancy rate reflects the ratio between job vacancies in the economy and total demand for workers in the business sector. An increase in the job vacancy rate is an indication of increasing demand for new workers. It is therefore important for assessing the state of the labor market. In the first half of 2021, following the removal of activity restrictions, the supply of labor and the demand for workers expanded simultaneously. The expansion of supply was measured through an increase in the participation rate, which came close to its prepandemic level (Figure 2), and the expansion of demand for workers was reflected in the job vacancy rate, which jumped sharply (Figure 1.4 in the Chapter and Figure 3 in this Box).

The job vacancy rate declined slightly in 2022, after the employment rate had already increased to its pre-COVID-19 level, yet remained higher than in the past until the end of the year. Despite the high job vacancy rate, the unemployment rate—which declined rapidly following its peak in the second quarter of 2020—has been similar to its precrisis levels since the beginning of 2022. Figure 3 shows the Beveridge Curve, which describes the negative correlation between the job vacancy rate (the vertical axis) and the unemployment rate (the horizontal axis). It shows that the rapid recovery of the labor market in the second quarter of 2021 and the need to rapidly match the large number of workers with available jobs were reflected in some temporary impact to the quality of the correspondence between workers and jobs, meaning that they added to the difficulty in matching workers to jobs.[3] Such an impact is reflected in the movement of the Beveridge Curve, as a whole, upward and rightward.[4] It is likely that the upward movement, which mainly reflects concurrent growth of unemployment and the number of job vacancies in the first half of 2021, was due to two contemporaneous changes: the removal of restrictions, which led to a sharp increase in the number of job vacancies, and the cancellation of the furlough policy, which led to a temporary increase in the rate of job seekers.

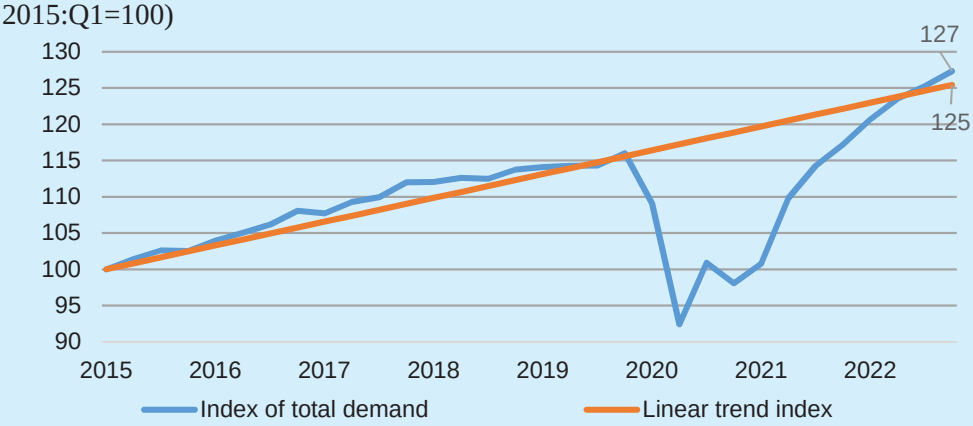
[1] Job vacancies are unfilled jobs for which workers are sought, or filled positions where firms seek to replace the employees. The population of the Central Bureau of Statistics job vacancy survey includes companies with 5 or more salaried employees. The survey does not include companies in the agriculture industry, the public sector, the diamond industry, out-of-state organizations or entities, or educational institutions from pre-school through secondary school.

[2] Aggregate demand for workers has been in an upward trend over time due to the increase in the population.

[3] In dynamic models that include labor market search and matching frictions, various shocks are generally reflected in movement along the Beveridge curve. A shock that hits the speed at which firms and workers find each other is unique, in that it leads to movement of the curve itself. This is partly reflected in a temporary increase in the structural unemployment rate. More on this topic appear in the study presenting such a model, which was developed at the Bank of Israel in recent years: A. Binyamini (2021). "A Structural Investigation of Israeli Labor Market Dynamics: A DSGE-Based Analysis", Bank of Israel Research Department Discussion Paper 2021.19.

[4] The quarters of 2020 featured a circular motion of the curve: a decline in job vacancies, which then led to an increase in unemployment. In the first half of 2021, when unemployment was still high and even increasing, the number of job vacancies jumped. This combination of a simultaneous increase in job vacancies and unemployment moved the curve upward.

Figure 1
Estimated Aggregate Demand for Workers in the Business Sector, 2015–2022 (forecast trend based on 2015–2019, and actual data; index: 2015:Q1=100)



The 2015-2019 trend was calculated using a linear forecast. The estimated aggregate demand is equal to the total filled and vacant positions, and is based on industries presented in the Job Vacancy Survey (for details see the Central Bureau of Statistics website).

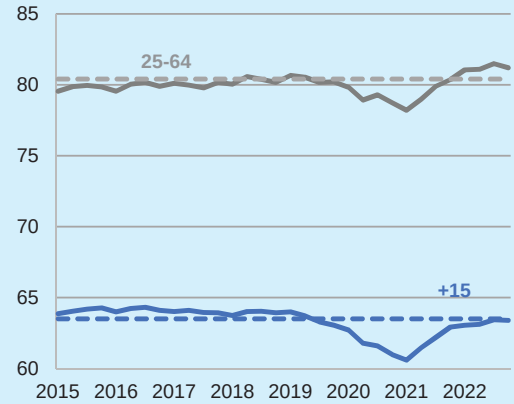
SOURCE: Based on Central Bureau of Statistics Job Vacancy Survey.

The high job vacancy rate should have raised the employment rate to a higher level, and should even have contributed to a decline in unemployment to below its precrisis level and to significant wage increases. These did not happen, and a possible explanation may be that the expansion of employment was accompanied by some growth in the supply of labor, as shown by the increase in the participation rate (aged 25–64) beyond the rate that was prevalent in the years prior to COVID-19 (Figure 2).

Figure 4 shows demand for workers and actual employment at the end of 2022, broken down by industry and compared to the 2015–2019 trend. The trend takes into account what should have been the number of employees had employment in 2020 and 2021 continued to grow at a fixed rate that was in line with the average growth rate in previous years. The trend was calculated separately for each industry. The Figure shows that not only the overall level, but also the industry composition, of demand for workers and of employment largely returned to the precrisis levels. Viewing them relative to the trend makes it possible to see in which industries employment continued to grow at a high pace during the COVID-19 period (the industries in which the blue row in the Figure reaches 1 or higher), compared with other industries in which the employment growth trend during COVID-19 did not continue from the precrisis years (where the blue row is below 1). The number of job vacancies in these industries, which is higher than in the past, indicates manpower needs at a lower level than the growth trend. This is shown by demand for workers, which is lower than the long-term growth trend (the orange rows that are lower than 1).

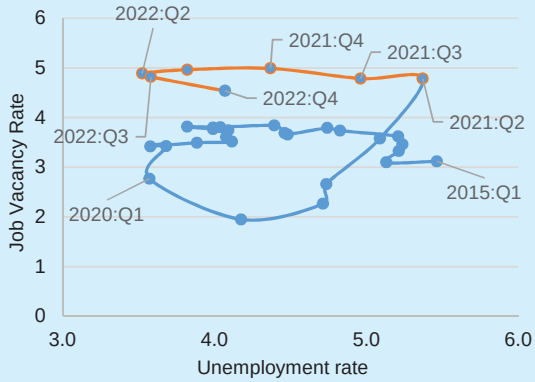
These developments of employment and demand for workers show that the period of COVID-19 and the recovery from it affected various industries differently. In some industries, the impact on employment was still felt in 2022, although it declined, just as it was felt in private consumption (Chapter 2). The rapid growth of employment was thus a feature of industries in which it was possible to work by remote (the information and communications industry, most of which is included in the high-tech sector, is a particularly

Figure 2
Labor Force Participation Rate, 2015–2022 (quarterly data, ages 15+ and 25–64)



The broken lines show the 2019 averages.
SOURCE: Central Bureau of Statistics.

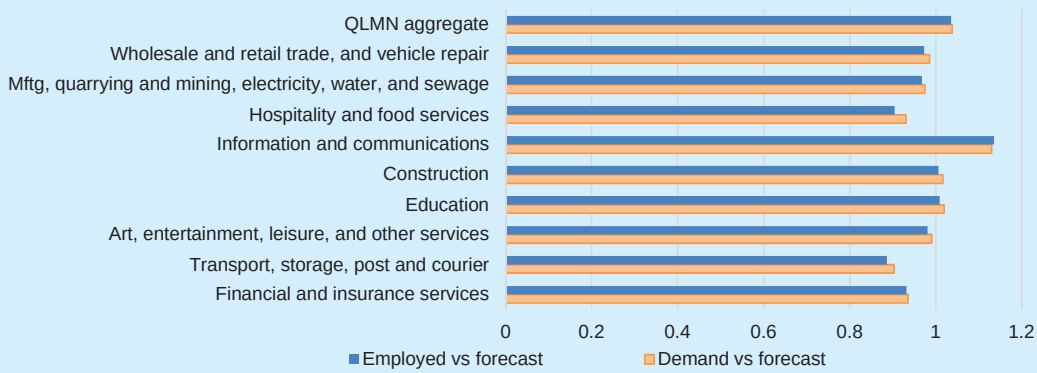
Figure 3
Beveridge Curve: Unemployment Rate (15+) and Job Vacancy Rate, 2015–2022 (quarterly data)



The orange line is the quarters since the start of the recovery from the COVID-19 crisis (2021:Q2 and onward).
SOURCE: Based on Central Bureau of Statistics.

prominent example), while employment contracted in industries where the consumption of services was restricted during the crisis due to their nature (such as the hospitality and food industry and the transportation, storage, post, and courier industry). The financial services and insurance services industry was an outlier. Employment in that industry is lower than its trend, even though it continued to operate without special restrictions during the COVID-19 period. This decline is explained by streamlining in some business in the industry during the COVID-19 period—an acceleration of the trend that had been taking place in those businesses prior to COVID-19.

Figure 4
Demand for Workers and Those Employed, 2022:Q4 Compared with Forecast (according to the 2015–2019 trend, by economic industry)



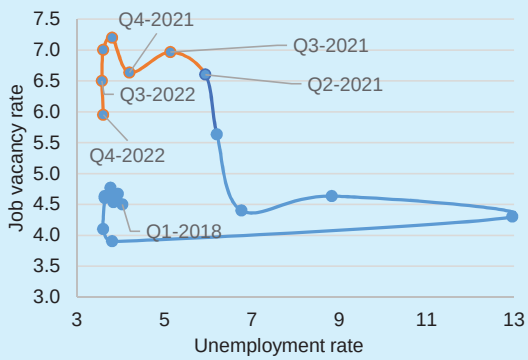
Demand for workers includes the employed and job vacancies. The long-term trend is linear based on the years 2015-2019. The QLMN aggregate includes real estate activity; professional, scientific, and technical services; other business services; and health, welfare, and long-term care services. Values higher than 1 mean that the actual figure is higher than the trend, while values lower than 1 mean that the actual figure is lower than the trend. The industries are listed in ascending order by weight among the employed (in the Job Vacancy Survey sample).
SOURCE: Central Bureau of Statistics Job Vacancy Survey.

The sharp increase in the job vacancy rate is not unique to Israel

A high job vacancy rate even after a decline in the unemployment rate was not unique to the Israeli economy. Figures 5a and 5b outline similar developments in the US and in the EU. This development, which is common to many countries, points to the uniqueness of the economic recovery from the COVID-19 crisis relative to previous crises.

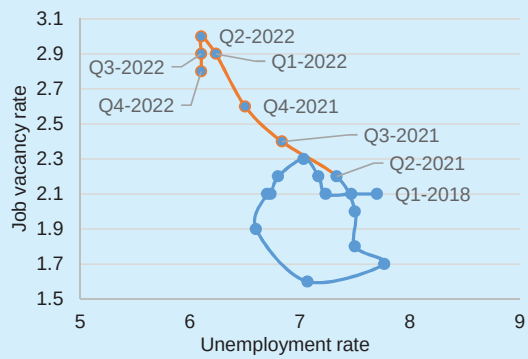
The OECD notes two main factors as possible explanations for the sharp jump in job vacancies in many countries following the peak of the COVID-19 crisis.[5] First, employee recruitment and employment mobility programs were pushed off until after the COVID-19 period. This built up the need not only to recruit, but also to replace workers. The delay of reorganization programs was affected not only by economic uncertainty, but also by special programs to support workers and the unemployment during the pandemic. Second, the recovery of demand for goods and services led to a sharp increase in consumption from the second half of 2021, following a period of "trapped demand". In some industries, there was even a need to expand employment beyond the precrisis trend. Some of the explanation for such a sharp increase in demand has to do with the expansionary fiscal policy adopted by many countries during the crisis, which enabled households to not only maintain their purchasing power, but also to increase it due to their increased savings as a result of lower consumption during the crisis (as a result of COVID-19 restrictions).

Figure 5a
US Beveridge Curve: Unemployment and Job Vacancy Rates, 2018–2022 (quarterly data)



The orange line is the quarters since the start of the recovery from the COVID-19 crisis (2021:Q2 and onward).
SOURCE: Based on BLS.

Figure 5b
European Beveridge Curve: Unemployment and Job Vacancy Rates, 2018–2022 (quarterly data)



The orange line is the quarters since the start of the recovery from the COVID-19 crisis (2021:Q2 and onward). Figures are the average of 27 European Union member countries.
SOURCE: Based on Eurostat.

[5] OECD (2022). "OECD Employment Outlook 2022: Building Back More: Inclusive Labour Markets", OECD Publishing, Paris. https://doi.org/10.1787/1bb305a6-en

d. The high-tech sector

The high-tech sector is considered the engine of the Israeli economy. It is growing rapidly, and is highly important to the economy.

The high-tech sector is considered the "engine" of the Israeli economy. It grows rapidly, and is very important to the economy. By international comparison, it accounts for a high share of Israeli employees—more than 10 percent. Due to the high labor productivity that it features, its share of GDP is even higher—about 16 percent. The high-tech sector is particularly prevalent in total exports of goods and services. In 2022, the sector's exports accounted for 49 percent of Israeli goods and services exports (excluding diamonds) and 56 percent of services exports. Accordingly, direct tax revenues from the sector are also high. [15] Israel is a significant participant in the venture capital market. Israeli high-tech companies received about 4 percent of total global venture capital investments in 2022, which is roughly ten times Israel's share of global GDP.[16] The sector employs Israeli workers whose human capital is high in a competitive global labor market.

The high-tech sector in 2022 showed some cooling in activity relative to 2021. The latter year was exceptional for the entire global technology sector, and particularly for Israeli high-tech.

The high-tech sector in 2022 showed some decline in activity relative to 2021. The latter year was exceptional for the entire global technology sector, and particularly for Israeli high-tech. Under the influence of high demand for technology products, and in view of the low interest rates in 2021, Israeli startups succeeded in raising very high volumes of capital, mostly venture capital, relative to the amounts raised in previous years (Figure 1.6). In the same year, a record number of companies were issued on the Tel Aviv Stock Exchange (Box 4.1 in Chapter 4), and their valuations were high.[17] In 2021, demand for workers in the high-tech sector grew rapidly, tax receipts from the sector were high, and high-tech exports (both goods and services) reached very high levels.[18]

Throughout most of 2022, the technology stock indices both in Israel and abroad were in a downward trend, and valuations of private technology companies were cut.[19] These developments had an impact not only on startup companies, the existence of which is greatly dependent on their ability to raise capital, but also on mature high-tech companies, which employ about 90 percent of the sector's employees in Israel. Financial developments during the year raised concerns over the lower availability of capital and its potential effect on the global technology sector's activity, including in

[15] The high wages paid to employees in the sector generate tax revenues, options to employees generate capital gains taxes, and the State also receives high tax revenues from corporate taxes and from exits.

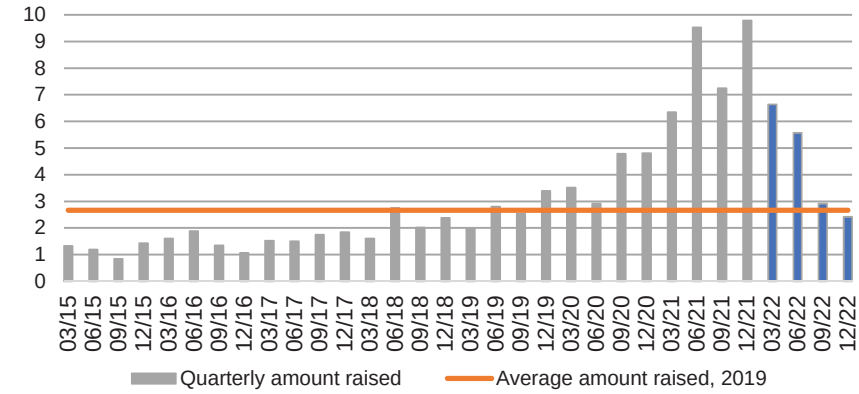
[16] This assessment of Israel's share in global venture capital raised in 2022 is based on data from crunchbase.com, IVC Analytics, and the World Bank. A similar assessment regarding 2019 appears in the issue "Financing Characteristics of High-Tech Companies in Israel" in the Bank of Israel Annual Report for 2019.

[17] Thirty-eight percent of the equity capital raised on the Tel Aviv Stock Exchange in 2021 was raised by high-tech companies. (SOURCE: Tel Aviv Stock Exchange (2023). Annual Review 2002, Table 4.)

[18] For more information, see Chapters 1 and 6 in the Bank of Israel Annual Report for 2021.

[19] E. De Malach, M. Haran-Rosen, Y. Friedman, and T. Ramot-Nyska (2022). "Assessing the Implications of the Declines in the Capital Market for the Stability of the Israeli High-Tech Sector", Bank of Israel.

Figure 1.6
Capital Raised by Israeli Startups, 2015–2022 (quarterly amounts, US$ billion)



SOURCE: Based on IVC Analytics.

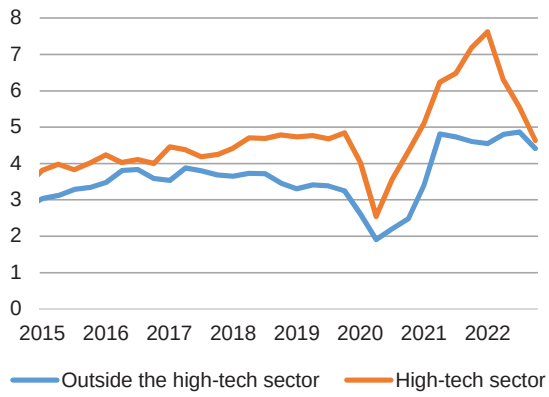
Israel.[20] There were additional concerns of a potential slowdown in real economic activity, which would reduce the global demand for technology goods and services. In view of this, the trend of growth in the job vacancy rate in the high-tech sector reversed at the beginning of 2022. The decline continued throughout the year, and was in line with the negative sentiment in the financial markets toward the technology sector. At the end of the year, the job vacancy rate in high-tech companies was similar to the rate before the COVID-19 pandemic, and to the rate among companies that are not in the high-tech field, which was still higher than in the past (Figure 1.7). However, compared with 2019, total demand for high-tech workers (the number of employees plus the number of job vacancies) increased more rapidly than the rest of the business sector (Figure 1.8).

Job vacancy and capital raising data for 2022 show that throughout the year, the Israeli high-tech sector cooled relative to 2021. However, activity remained at a high level that was similar to the period before 2021—a year that was exceptional. High-tech services exports remained a dominant component in services exports, which have been growing rapidly in Israel in recent years, and high-tech output great by almost 9 percent in real terms. Startup companies' capital raising, which dropped sharply throughout the year, was significantly lower than its high level of 2021, but was similar to its volume prior to the pandemic, while demand for workers remained high and continued to climb rapidly relative to the rest of the business sector's companies (Figure 1.7). The average wage in the high-tech sector also increased, by 5.2 percent (yearly average in current prices), which was much more rapid than in the rest of

[20] A decline in the availability of capital may affect both startup companies' ability to raise capital and companies' ability to make exits. Startup companies hold financing rounds once every two years on average. Therefore, if the need to raise capital is not immediate, some companies may prepare in advance for potential difficulties through streamlining, with the expectation that the difficulties in raising capital will persist.

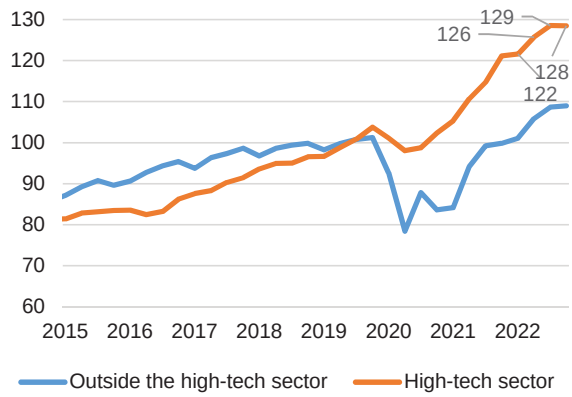
the business sector (1.7 percent). The slowdown in the expansion of employment in the sector may reflect caution, due to uncertainty regarding a potential slowdown of demand for the industry's products and a decline in financial sources in the industry.

Figure 1.7
Job Vacancy Rate in the High-Tech Sector and the Rest of the Business Sector, 2015–2022 (as a share of total vacant and filled positions, percent)



Shown as quarterly averages of original data.
SOURCE: Based on Central Bureau of Statistics Job Vacancy Survey.

Figure 1.8
Demand for Workers in the High-Tech Sector and the Rest of the Business Sector, 2015–2022
(index: 2019 average=100)



Shown as quarterly averages of original data. Demand for workers equals the total of filled and vacant positions.
SOURCE: Based on Central Bureau of Statistics Job Vacancy Survey.

e. Fiscal policy

Following two years in the shadow of the COVID-19 crisis, which featured fiscal expansion to an exceptional scale, 2022 was a year of tightening fiscal policy. The total deficit of the general government declined sharply, to just 1.6 percent of GDP, following two years of high deficits due to the pandemic (Table 1.1). There was a government budget surplus of 0.6 percent of GDP.[21] The decline of the deficit was mainly a result of a reduction in public expenditures as a share of GDP, due to the end of the assistance programs operated during the COVID-19 crisis, but it also reflected an increase in public revenue as a share of GDP. Accordingly, and with the rapid growth of GDP, public debt declined in 2022, to 60.7 percent of GDP at the end of the year (Table 1.1). This was close to the median level among advanced economies,

Following two years in the shadow of the COVID-19 crisis, which featured fiscal expansion to an exceptional scale, 2022 was a year of tightening fiscal policy.

[21] The general government is comprised of the government itself, the National Insurance Institute, the local authorities, and nonprofit institutions (the health funds, the universities, Yeshivot, etc.), the income of which comes mostly from the government and the national institutions (the Jewish Agency, the Jewish National Fund, and the World Zionist Organization). The general government's activity is measured in accordance with national accounting definitions, which differ from those used in the State Budget. The difference between the general government's deficit and that of the central government mostly reflects different accounting definiitions and not deficits of the other entities in the general government.

and around the level of the debt prior to the outbreak of the pandemic. The decline in the debt to GDP ratio was also due to the acceleration of inflation, which eroded the unindexed part of debt (which is about half of the government's debt) relative to nominal GDP.

As in the rest of the world, the general government's expenditures relative to GDP were exceptionally high by historic comparison during the pandemic, due to transfer payments to support businesses and workers, and due to additional expenditures related to dealing with the pandemic. In 2022, these payments were stopped, and government expenditures relative to GDP declined to a level slightly lower than they were prior to the pandemic. The end of the pandemic also saved the government expenditures that were allocated in designated budgets ("COVID-19 baskets") particularly for this purpose. Another reason for the moderation of the growth in current expenditures relative to GDP ion the past two years is the moderate growth of wage expenditures due to the lack of an updated framework agreement for public sector wages (Chapter 6).[22]

General government revenues relative to GDP increased to a level higher than the level prior to the pandemic. This growth reflected an increase in the weight of taxes, which was mainly due to an increase in direct tax revenues relative to GDP. Thanks to the recovery of activity, payroll taxes and corporate tax revenues increased. However, the high revenue was also affected by factors that do not necessarily go together with economic growth, such as capital gains taxes from the high level of activity in the high-tech sector. Exceptional revenue from real estate taxes this year are another example of this. These increased greatly, since home prices increased sharply and the average number of transactions during the year was high (even with the sharp decline relative to 2021). The decline in the number of real estate transactions in 2022 and the moderation of capital raising in the high-tech field are expected to moderate tax revenues in the coming years.

f. Israeli demography and its implications

The rapid population growth is eroding the per capita stock of all physical infrastructure in Israel.

The growth rate of the Israeli population, about 2 percent per year, is among the highest in the OECD. Average population growth in the OECD countries is only about 0.6 percent per year.[23] According to the Central Bureau of Statistics demographic forecast, the Israeli population, which is currently about 9.7 million (Table 1.1), will be more than 15 million in 25 years.[24] The rapid population growth is eroding the per capita stock of all physical infrastructure in Israel, including in the areas of transportation, housing, energy, and communications. It therefore requires high levels of investment just to answer the increase in population. But that is insufficient to catch up with the

[22] In 2021, the fact that the government operated for about half a year without an approved budget also contributed to this.

[23] SOURCE: OECD.stats

[24] Central Bureau of Statistics (2017), "Israeli Population Forecast to 2065".

international figures, taking into account the current low level of the per capital stock of capital by international comparison.

The demographic trends in Israel run contrary to those in many of the other advanced economies. The birth rate in Israel is much higher than in other countries, and the composition of the population is therefore younger than in many other countries (Figure 1.9).[25] Therefore, the rapid growth rate of the population also contributes to unique housing challenges. For demographic reasons only, an addition of more than 55,000 housing units is required each year[26] (a number that is equivalent in size to a city such as Ashkelon or Bat Yam). This puts into sharper focus the need to invest more than other economies in the development of physical infrastructure. In addition, the high rate of children in the population, and the importance of human capital as a factor that generates long-term growth, necessitate a high level of investment in high-quality education infrastructure, and providing quality education to all children.[27]

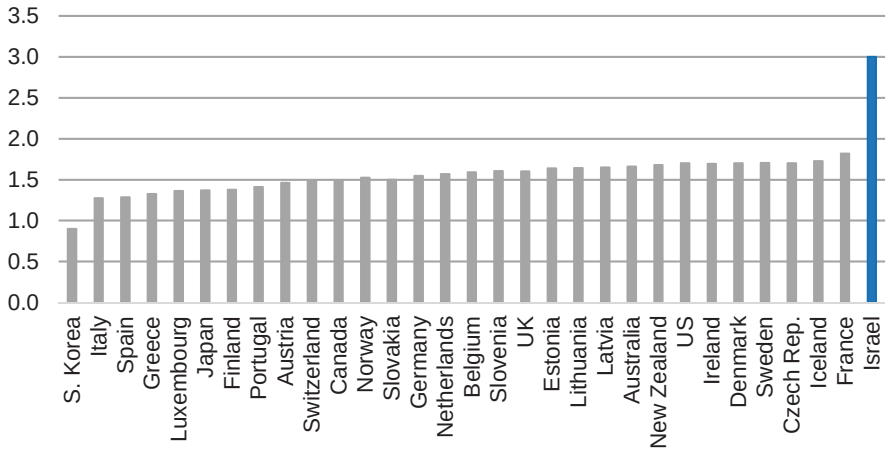
Chapter 7 of this Report shows that the main reasons for the differences in per capita income between Arabs, *Haredim* (ultra-Orthodox Jews) and non-*Haredi* Jews are low labor income in Arab and *Haredi* households, and the fact that those households are larger. Differences in education play a major role in the differences in earning capacity, since they influence both the scope and the quality of employment. In the Arab sector, and among non-*Haredi* Jews, changes have taken place that, over time, have increased the rate of those with academic degrees (particularly among women). Those changes are contributing to an increase in labor productivity and to processes socioeconomic mobility. At the same time, there is a reverse process taking place among *Haredi* men, which has led to a widening of the education gaps. Among *Haredi* women, the rate of those with academic degrees has risen, but only slightly, and much less than the increase among non-*Haredi* Jewish women. Taking Israel's demographic trends into account, the *Haredi* population's share is expected to increased, from about 13 percent currently, to about a quarter in 25 years (and to almost one-third by 2065). This illustrates the tremendous importance of learning subjects that are essential for integration into high-quality employment in education frameworks in Israel. Raising the quality of all parts of the education system will help adjust the abilities of future workers to the skills necessary in the labor market, and will thus contribute to narrowing wage gaps in all parts of Israeli society.

[25] In order to maintain a fixed population size, the birthriate must be slightly greater than 2 children per woman. In some countries with a birth rate of less than 2 children per woman, the population increased in any case, due to net positive migration to them. In Israel, the average number of children per woman is much higher than 2.

[26] A monitoring report (June 2021) on the National Economic Council's strategic housing program for 2017–2040 estimates that the economy's demographic needs in 2021–2025 are about 60,000 housing units per year.

[27] Bank of Israel (2019). "Research Department Special Report: Raising the Standard of Living in Israel by Increasing Labor Productivity"; Bank of Israel (2023). "Recommended Strategic Pillars of Action for the Government".

Figure 1.9
Average Number of Children per Woman (Total Fertility Rate), 2018–2020 average



The total fertility rate is the number of children a woman is expected to have during her lifetime. For details on the assumptions underlying the calculation, see Central Bureau of Statistics (2022), "Childbirth and Fertility in Israel, 2022".

SOURCE: OECD.stats.

The wage agreement signed with the teachers in 2022 reflects the implementation of a number of important measures to improve the quality of the education system. It improves the terms of employment, mainly for beginning teachers, increases incentives for excellence, and increasing administrative flexibility for school principals. However, a number of important issues were dealt with only partially in the agreement. These include reinforcing the compensation system for teachers of subjects where there are marked shortages and for teachers employed at weak schools or those in the periphery. Another important issue that the agreement touched on but did not provide any significant progress is synchronizing school vacations with those of working parents.

3. MONETARY AND FINANCIAL DEVELOPMENTS IN ISRAEL

a. The outbreak of inflation

In view of the increase in inflation, the Bank of Israel raised its interest rate during the year, following a number of years when the rate was kept near zero.

Inflation in Israel totaled 5.3 percent in 2022. The increase of inflation beyond the upper bound of the Bank of Israel target range (1–3 percent), for the first time in a decade, was a continuation of the process that began in 2021—when inflation climbed to 2.8 percent (Figure 1.1 and Table 1.1). In view of this, and after the cancelation in 2021 of the special expansionary measures taken during the COVID-19 period, the Bank of Israel raised its interest rate during the year, following a number of years when the rate was kept near zero (Figure 1.2 and Table 1.1). The interest rate increases began with the April 2022 decision. Before that, the interest rate was 0.1 percent, and

by the end of the year it reached 3.25 percent, its highest level since the beginning of the previous decade. The interest rate increases continued into 2023. The outbreak of inflation and the turnaround in monetary policy were global phenomena this year, and were even more pronounced in the US and in Europe (Figure 1.1). Accordingly, and after many years of monetary accommodation through near-zero interest rates and other tools, interest rates in the US and Europe began climbing sharply (Figure 1.2).

Until the beginning of 2022, the causes of the price increases were considered short-term.

Price increases encompassed both domestic services, which were influenced by domestic conditions, and tradable goods, which were influenced by supply disruptions in the global market as well as by the shekel's depreciation against the US dollar. The various difficulties in global supply were reflected in price increases already in 2021. Accordingly, accommodative measures and special monetary tools used in Israel during the COVID-19 lockdowns were tapered in 2021. Many central banks, including the Bank of Israel, viewed the causes of the price increases as temporary until the beginning of 2022, and therefore did not find it proper to act against them through aggressive monetary tightening.[28] At the beginning of 2022, inflation was influenced by a new development that had a marked impact on global economic activity and prices—the war between Russia and Ukraine, which led to a global energy and food crisis. Against this background, inflation in Israel reached higher rates in 2022 than was expected during 2021.

The structure of the Israeli energy market contributed to the relatively moderate increase of inflation in Israel.

An important part of the explanation for the relatively moderate increase in inflation in Israel is attributed to the nature of the impact of higher energy prices. Section 4 of this Chapter deals partly with the effect of the structure of Israel's energy market on how the country dealt with the global developments in 2022. The discussion there helps provide an understanding of why Israel's exposure to the sharp increases of global energy prices, particularly natural gas prices, was limited during the energy crisis that developed in early 2022. Israel generates its own natural gas, mainly from the Tamar and Leviathan gas fields. Domestic natural gas prices, as well as supply quantities, are fixed in long-term contracts between the natural gas partners and consumers, chiefly the Israel Electric Company.

The increase in inflation encompassed all CPI components.

With regard to the domestic conditions, the dwindling economic effects of the COVID-19 pandemic in Israel, as in other countries, was reflected in growing demand already in 2021, and that growth continued in 2022. Chapter 3 discusses its contribution to the increase in inflation. The growth in demand was reflected in an exceptional increase in demand for workers in Israel, as well as in many other OECD countries. Despite this, and further to with the discussion presented above regarding the moderate development of wages in 2022, a formal analysis of the contributions to inflation (Chapter 3) actually shows that wages are not included in the category of inflationary factors this year.

Many years of low inflation have turned it into an insignificant consideration in decision-making by firms and households—a phenomenon that is usually referred

[28] Chapter 3 shows the sharp jump in the supply chain stress index for Israel in 2021, and its decline in the second half of 2022, which was later than expected.

to as "rational inattention". However, a rapid and marked increase in the inflation environment may shift our attention to it as well. That attention induces feedback mechanisms that affect the dynamics of inflation itself. Box 1.2 explains how an increase in the level of inflation changes its nature as well. Such a change may have been one of the factors that intensified the increase in inflation in some economies, and due to it, inflation may have become more general and broadly reflected in rapid price increases in many components of the Consumer Price Index.

The government took a number of policy measures with the aim of reducing the burden of price increases on the public. These included reducing the excise on fuel and coal, reducing import taxes, and increasing support measures (increasing the earned income tax credit and providing additional income tax credit points). The cost of these measures totaled about 0.5 percent of GDP (Chapter 6). The measures may have reduced the burden for households during the year, particularly as price increases encompassed many consumption items (Chapter 3). However, the measures taken do not get to the bottom of the cost of living problem that affects price levels in Israel, which is a separate issue from inflation. In order to lower the cost of living, the government must continue implementing the reforms that have been started, for instance by increasing competition in the import of goods, and expand them to additional areas. In the longer term, labor productivity in the economy and the earning capacity of employees must be increased through investment in human and physical capital.

The pace of rent increases accelerated this year. Home prices increased rapidly, but the pace of increase was halted in the fourth quarter of the year.

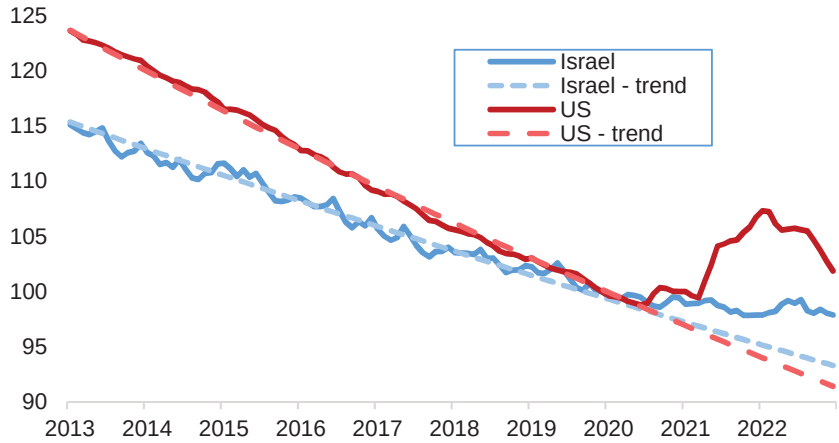
The pace of increase in rents accelerated steadily since the beginning of 2021, and in 2022 the increase totaled 6.3 percent. This followed a number of years before the COVID-19 pandemic in which the annual increase in rents was about 2 percent. While real estate prices are not included in the Consumer Price Index, they have a macrofinancial impact with implications for the inflation environment and monetary policy. Despite the increase in the interest rates and the decline in the number of housing transactions, and despite the marked growth in supply throughout the chain (permits, building starts, marketing), home prices increased sharply in the first three quarters of the year, with the increases coming to a halt only in the fourth quarter of the year. Over the year as a whole, home prices increased by about 14.6 percent. There were also significant increases in home prices in other economies during part of this period. In Israel, the increase in home prices is also influenced by supply considerations and by the rapid growth of the population, which is discussed in Section 2

The exchange rate was volatile, with a tendency toward depreciation of the shekel.

The nominal effective exchange rate was volatile during 2022, with a tendency toward depreciation of the shekel, following a trend of appreciation of the shekel that lasted about a decade. As Table 1.1 shows, the shekel-dollar exchange rate averaged NIS 3.4/$1 in 2022 (similar to its level in 2020, and after declining to NIS 3.2/$1 in 2021). Chapter 3 discusses this development and its contribution to inflation. Compared to 2021, the real exchange rate declined by just 0.9 percent (reflecting real appreciation), which was smaller than the sharp declines of previous years (Table

1.1). The real appreciation over the past few years reflects, in part, the growth of labor productivity in Israel which, in recent years, was more rapid than the OECD average (Chapter 5).

Figure 1.10
Ratio Between the CPI of Tradables and Nontradables, US and Israel (index: Dec. 2019 = 100)



All index readings, for Israel and the US, both tradable and nontradable, are excluding energy and food. For the US, the nontradables index is the index of services prices.
SOURCE: Based on BLS and Central Bureau of Statistics.

The COVID-19 crisis and the Russia-Ukraine war created bottlenecks in international shipping and a shortage of commodities, which affected different countries in different ways. Many tradable goods and services therefore became less tradable. Thus, in addition to the increases in their prices relative to those of nontradable goods and services—and contrary to the long-term trend in Israel and abroad (Figure 1.10)[29]—the prices of tradable goods and services developed differently in different countries. The variance between economies in the development of tradable goods prices was another, short-term, factor in the development of the real exchange rates this year.[30]

[29] The relative reduction in prices of tradable goods in the years prior to the COVID-19 crisis was more rapid in the US. This is consistent with more rapid growth of labor productivity there than in Israel during those years (since growth of labor productivity leads to a relative reduction in the prices of tradable goods). This is in contrast to the average growth of labor productivity in all OECD member countries, which was slower than the growth in Israel (Chapter 5).

[30] In general, differences between countries in the development of prices of nontradable goods and services have a dominant effect on the development of the real exchange rate. But in a period in which the development of prices of tradable goods also differs greatly between economies, this difference may be another important factor in the development of the real exchange rate.

BOX 1.2: HOW DOES PUBLIC ATTENTION TO INFLATION AFFECT ITS NATURE?

The term "inflation" refers to increasing prices of all goods, services, and assets. However, the change in the price level reflects, at any point in time, a mixture of two types of prices changes that differ in their underlying drivers and impacts: a contemporaneous change in all prices in the economy, which is reflected in erosion of the value of the currency, and changes in the relative prices of sector-specific goods and services (which may also have an impact on aggregate inflation).

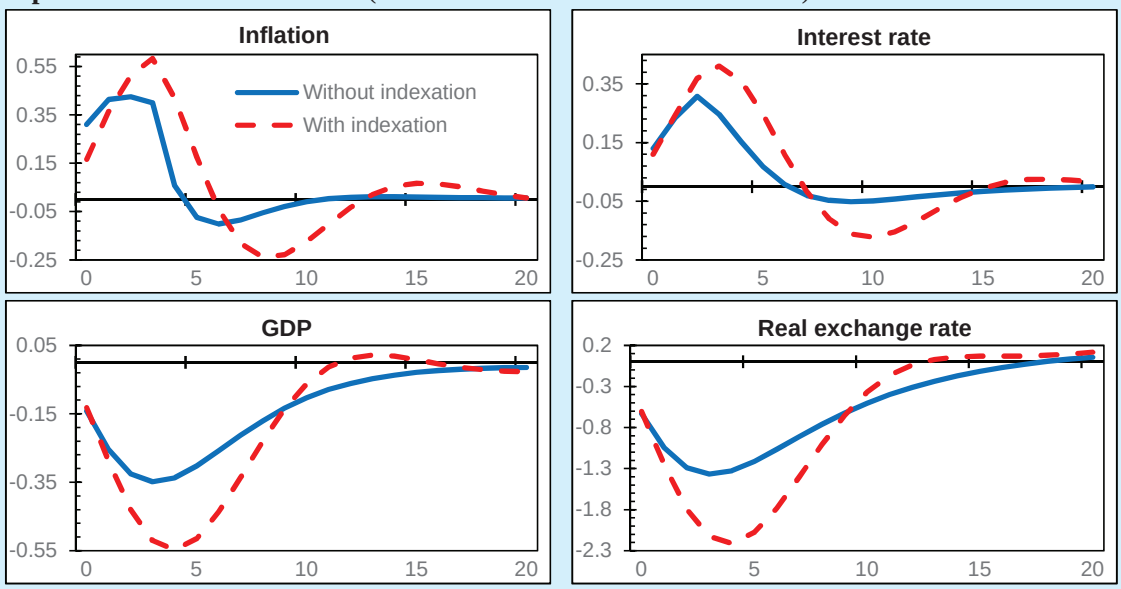
There are two main drivers of changes in relative prices, and they are also relevant for a low inflation environment. One driver is an industry-specific development that affects supply or demand in that industry—an "idiosyncratic shock" that generates a change in relative prices in response to real events (such as an increase in the price of oil due to a global shortage). The other driver is short-term price rigidity, which means that various prices are updated at different timings.

Inflation in which the dominant component is a broad change in prices tends to be more difficult to stabilize, since such inflation tends to be considered comprehensive and prolonged and is therefore reinforced by constant price revisions aimed at preventing their erosion. In contrast, inflation that mainly features relative price changes reflects industry-specific changes. In such a case, if expected inflation remains low, due to a proper monetary policy, relative prices will be stabilized once demand and supply converge to a new equilibrium. This will also stabilize inflation itself, after various prices adjust to economic developments.

When the change in the relative price takes place regarding a broad input such as oil, it will affect the prices of a variety of goods and services. However, the broad impact of such price increases will be accompanied by a restraint on activity, and will therefore not necessarily lead to widespread prolonged price increases. However, if inflation that begins as a reflection of a change in relative prices is accompanied by some impact to trust regarding the central bank's resolve to stabilize it, it may become prolonged.

The Bank of International Settlements (BIS) Annual Report (2022, Chapter II) distinguishes between the two types of inflation. In making this distinction, it discusses the behavioral differences that explain the difficulty in stabilizing inflation that reflects broad price changes: An increase in the inflation environment incentivizes the public and firms to use indexation mechanisms to hedge against it. The indexation mechanisms are means to update the prices of goods and services according to known inflation, meaning inflation from the previous period. The aim of the indexation is to prevent inflation from eroding the real value of goods, services, and assets. However, the use of such mechanisms also involves externalities that modify the inflation dynamics and may make it worse. Indexation amplifies the effects of a given shock on inflation, such that inflation that began as a technical reflection of a sector-specific change in relative prices may generate a chain reaction of changes to all prices in the economy. This leads to a feedback reaction that will be reflected in higher and more prolonged inflation. The indexation mechanisms, by their nature, will also be reflected in a relatively high synchronization of price changes. In view of this, Chapter 3 discusses the broad nature of the inflation increase in 2022.

Figure 1
Response to an Inflation Shock (with and without indexation mechanisms)



The Figure is based on the impulse response to an inflationary shock according to the Bank of Israel Research Department's DSGE model (Argov et al (2012)). The horizontal axis shows the number of quarters following the shock. The blue line shows the impulse response in a model without indexations. The broken red line shows the impulse response to an identical shock (in terms of duration and intensity) in a model that includes an automatic update of goods prices and wages to the inflation that took place in the previous quarter. Inflation is the rate of inflation during the past four quarters, in terms of deviation in percentage points from the midpoint of the Bank of Israel's inflation target range (2 percent). Interest rate is the deviation of the Bank of Israel interest rate, in percentage points, from the long-term interest rate. GDP is the GDP gap, in percent, from its long-term trend. Real exchange rate is the deviation of the real effective exchange rate, in percent, from its long-term trend.

Figure 1 illustrates the theoretical distinction between two extreme situations—one in which indexation mechanisms do not operate, and one in which all prices are fully indexed to inflation that has taken place (in addition to price updates from time to time in response to various events). Following an inflationary shock, the central bank raises its interest rate. As a result, activity slows, which restrains inflation. It also results in a real appreciation—both as a result of the increase in inflation and as a result of the nominal appreciation driven by the interest rate. Under indexation mechanisms, a shock of the exact same nature and intensity leads to more prolonged and stronger responses and greater volatility on the part of all of the described variables. Therefore, in an economy that features inflation hedging mechanisms, a greater loss of output ("sacrifice ratio") is necessary to stabilize inflation.

Following a long period with a low inflation environment, attention to aggregate price changes may subside ("rational inattention"). This is essentially one of the most important achievements of an inflation targeting regime, and has been a feature of the Israeli economy for many years. In contrast, when the inflation environment rises, attention to its existence and to its effects also increases. The increase in attention may lead, in turn, to frequent price and wage revisions that compensate for their real erosion. Such revisions, whether systematic or sporadic, weaken the inflation target's function as a nominal anchor, which makes the effects of various shocks more prolonged and stronger.

Such a dynamic of reinforced inflation was a characteristic of the Israeli economy during and after the high inflation environment in the mid-1980s. Indexation to past inflation was common in the credit market (mortgages and CPI-indexed bonds), and in housing and other services (the value of which was often denominated in dollars). Even after inflation stabilized around the target, these mechanisms were abandoned only gradually and partially (they are still common in the credit market today), and continued to affect the macroeconomic dynamic for many years even in the low inflation environment.

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Bank of International Settlements (BIS) (2022). "Inflation: A Look Under the Hood", Annual Economic Report, June 2022, Chapter II.

b. Transition from monetary accommodation to monetary tightening

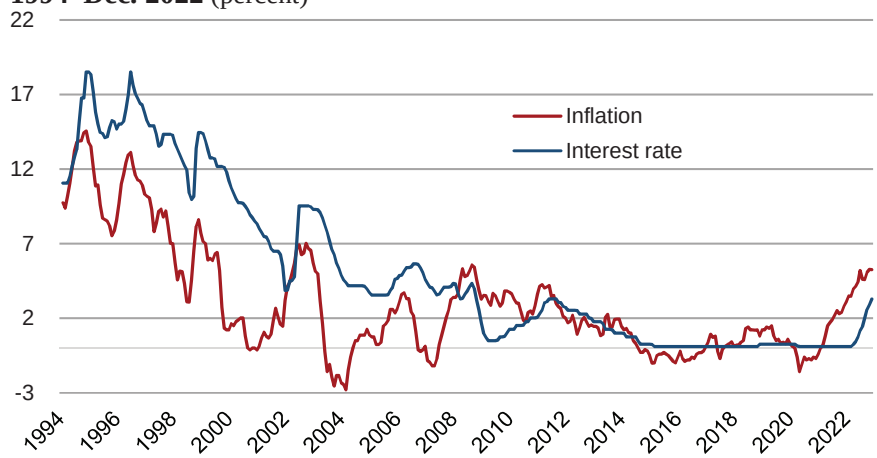
The increases in the Bank of Israel interest rate began once it became clear that inflation had started to exceed the upper bound of the target range.

In the summer of 2021, the Bank of Israel was among the first in the world to halt the use of the nonroutine accommodation tools that were used during the COVID-19 period. The February 2022 interest rate decision was made during the Omicron wave of morbidity and before the outbreak of the Russia-Ukraine war, but it already included an assessment that the process of raising the interest rate would begin soon. The interest rate began rising in the following decision—in April 2022. That decision was made after the wave of morbidity had subsided, and after inflation data were published showing that it was exceeding the upper bound of the target range (Figure 1.11 and Chapter 3). At that time, inflation in other economies was already much higher than their targets, and in most, the process of raising the interest rate had just begun (Figures 1.1 and 1.2). The deviation of inflation from the targets at that time, and the implications of the war in Ukraine, led central banks to increase interest rates rapidly.

The timing of the interest rate increases was also affected by the uncertainty that was prevalent at the beginning of the year.

The timing of the transition from monetary accommodation to monetary tightening reflects the caution that is necessary since monetary policy decisions are made under conditions of uncertainty. Since the effect of monetary policy is not immediate but delayed, it is necessary to make decisions when some of the relevant data are still unknown. Therefore, the response to an increase in inflation may turn out to be too early or too strong. Figure 1.11 indicates two periods in recent decades, during which the interest rate was significantly lower than the inflation rate. Both were periods of very large global crises. The first is the period of the Global Financial Crisis of 2008–2009, and the second is the period reviewed in this Report. The beginning of 2022

Figure 1.11
Inflation in the Past 12 Months and the Monetary Interest Rate, Jan. 1994–Dec. 2022 (percent)



SOURCE: Based on Central Bureau of Statistics data.

featured a high level of morbidity and mortality due to the Omicron wave (Figure 1.3), while the war in Ukraine was still not a factor (since it only broke out at the end of February). Although there was a high level of uncertainty regarding the continued development of the pandemic, the assessment was that the global supply chain disruptions would be solved within a short time. In order to avoid over-tightening, the Monetary Committee chose at the beginning of the year to hold off on increasing the interest rate. That enabled an examination of the development of inflation in view of the gradual cancellation of the use of the nonroutine accommodative policy tools that were used during the COVID-19 crisis—both in the monetary field (repo transactions with institutional investors, loan program to banks, and bond and foreign exchange purchases) and in the fiscal field (transfer payments and additional support payments due to COVID-19, which reached about 5.7 percent of GDP in 2020 and 3.7 percent of GDP in 2021).[31]

The timing of the transition from monetary accommodation to tightening—globally and also in Israel—was also partly due to the widespread approach to managing monetary policy: a flexible inflation targeting regime. In such a regime, alongside the commitment to the inflation target, central banks have additional policy goals—economic activity, employment, and financial stability. When this is the case, it is necessary to distinguish between inflation that reflects expanding demand and inflation that reflects restrained supply. Inflation due to expanding demand will be accompanied by growth in economic activity, while inflation that is due to restrained supply will be accompanied by a contraction of economic activity. Therefore, in

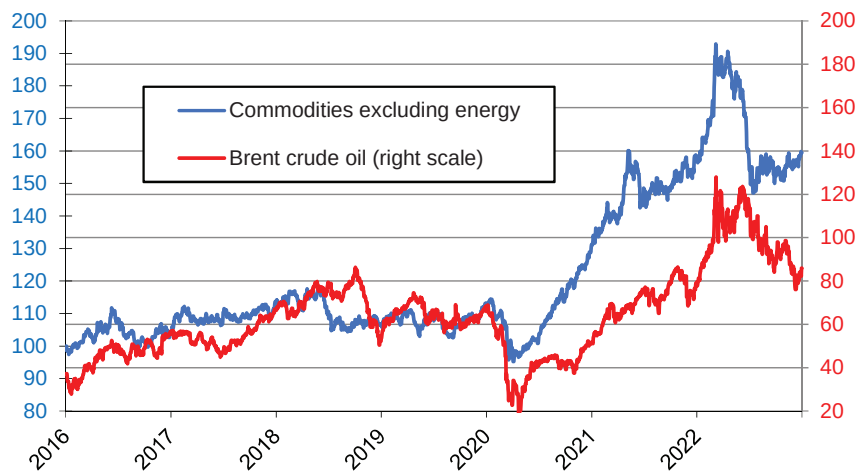
The timing of the interest rate increases was influenced by the Bank of Israel's other policy objectives, alongside the main objective of the maintaining the inflation target.

[31] According to the Bank of Israel Annual Report for 2021, Chapter 6: The General Government and its Financing.

a case where inflation reflects restrained supply, a slow and measured response is justified, relative to a response when inflation reflects expanding demand, since monetary tightening in response to supply shocks may have a negative impact on economic activity and employment targets.[32] At the beginning of 2022, inflation was attributed to global supply shortages, and there was therefore room to expect that it would have a restraining effect on real and financial activity. This was expected to contribute in turn to a restraint on inflation itself.

As stated, due to the nature of the causes underpinning the outbreak of inflation, these causes were at first perceived as not justifying rapid monetary tightening, since such tightening may turn out to be too early, particularly in view of the uncertainty regarding the robustness of real economic activity during the exit from COVID-19 (in Israel and even more so abroad). Figure 1.12 illustrates the sharp increases in global energy and commodity prices during 2021. These prices were expected to moderate after a short time (which would have a negative effect on inflation; this turned out not to be the case). But the increase in energy and commodity prices actually became more intense in the first half of 2022, following the outbreak of the war between Russia and Ukraine. These prices declined only in the second half of the year, and only after additional increases. The increase in the supply chain stress index (an index presented in Chapter 3) was also longer than initially assessed, and it began to subside only in the second half of the year.

Figure 1.12
Price of Brent Crude Oil (US$ per barrel) and Global Commodities Price Index Excluding Energy (Jan. 1/16=100), Jan. 2016–Dec. 2022



SOURCE: Based on Bloomberg.

[32] For more information on this topic, albeit in the context of inflation-restraining shocks, see the Bank of Israel Annual Report for 2018 (Chapter 1, Box 1.1: Monetary Policy in View of Supply Shocks).

During the year, inflation began to reflect an expansion of demand.

For a large part of the year, real yields on government bonds, in Israel and abroad, were negative. This was partly the result of the effects of the special accommodation measures adopted in response to the COVID-19 crisis—both fiscal and monetary—some of which had a prolonged effect on household income. Therefore, when the process of raising the interest rates began, some of the accommodative measures from the COVID-19 period were still having an effect. In addition, the effect of the tapering itself is gradual. Therefore, the increase in real yields, due to the transition to monetary tightening, was also gradual. Even though the change in policy in Israel already began back in the summer of 2021, the real yield on Israeli government bonds became positive, for all terms to maturity, only in the fourth quarter of 2022. While low real yields supported demand, the expansion of supply was slower because the nature of supply differs from that of demand. Supply involves the rehiring and reintegration of workers who were furloughed, the hiring and training of new employees, and the purchase of machines, equipment, and raw materials, as well as other adjustments. As these processes advanced throughout the year, the contribution of increased demand to inflation became more evident.

Once the process of raising the interest rate began, it was rapid.

Inflation in Israel increased later and more slowly than in other countries (Figure 1.1), and only after the nature and extent of the global phenomenon had become clearly evident and the conditions were already ripe for an increase in the interest rate. The process of raising the interest rate, once it began, was rapid—in Israel and in other economies alike. This was termed as "front-loading". The use of this term helped to communicate the circumstances that justified a rapid pace of interest rate increases.

The pass-through from the Bank of Israel interest rate decision to market interest rates works through a number of channels. In order to adjust the supply of *Makam* to demand for it, the Bank of Israel increased the pace of issuances in the fourth quarter of the year. The increase in the pace of issuances provided a response to the increasing demand for *Makam* in view of the interest rate increases, and is one of the transmission mechanisms to market interest rates. Increasing issuances made money market funds more attractive, and thereby contributed to a variety of alternatives available to the saving public. It also encouraged higher interest rates on deposits.

The various market interest rates responded to the increase in the Bank of Israel rate, but sometimes with a lag.

The increase in the Bank of Israel interest rate was reflected in a broad increase of interest rates on bank credit. However, as in most advanced economies, it translated only gradually to an increase in the interest rates on deposits at commercial banks. Box 4.2 in Chapter 4 explains why the pass-through to the interest rates on deposits tends to be weaker in an environment of low interest rates and excess liquidity, and strengthens only after a certain increase in the interest rate environment. The Box also shows that the pass-through in Israel was faster and stronger than in other countries.

The Bank of Israel's efforts to encourage an increase in the interest rate on deposits included the regular publication of the various banks' interest rates on loans and on deposits on the Bank of Israel's website. This was one of a collection of measures taken by the Bank of Israel in recent years as part of an over-all strategy to increase transparency and competition between the commercial banks. Among other things, that

strategy included the "one-click mobility" reform in 2021, the mortgage transparency reform in 2022, and the issuing of licenses to two digital banks, in 2019 and 2022.

The increase in the interest rate provides an incentive to minimize activity and to reduce the volume of cash and deposits held in current accounts. Chapter 3 points to a trend of reducing liquidity on the part of the public—reducing the volume of holdings in current accounts alongside a significant expansion of interest-bearing deposits (the volume of which almost doubled in 2022).

The increase in interest rates, in Israel and abroad, also had an impact on the costs of financing from nonbank sources. Equity prices declined and bond yields increased. Chapter 4 discusses these developments and their impact. Among other effects, the interest rate increases were reflected in truncating the wave of IPOs of 2020–2021, and in a turnaround in the development of credit. While the sharp growth of credit that began in 2021 continued in the first half of 2022, the expansion of credit from all sources (bank and nonbank) and to all segments (businesses and households) slowed in the second half of the year.

The increase in the interest rate influenced activity in the credit market.

The increase in the interest rates also raised the burden of loan repayments for businesses and households, including mortgage payments. This probably contributed to a downward trend in the number of home purchases in 2022 (Chapter 8).

Restraining inflation involves increasing the burden on the public—both due to the direct effect of raising interest rates that makes loans more expensive, and due to the indirect effect of restraining demand that may lead to harm to economic activity and to employment. However, such restraint is necessary, since without it, inflation may increase even more and make the harm even worse, particularly for the weaker population segments.[33]

4. THE ENERGY CRISIS IN EUROPE AND THE ISRAELI ENERGY MARKET'S ROBUSTNESS

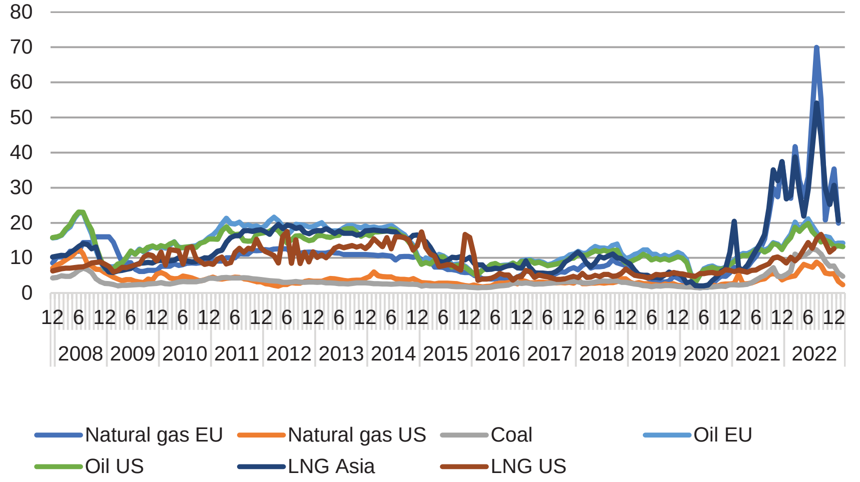
At the beginning of 2022, a global crisis broke out that was reflected in an increase in the prices of energy, chiefly natural gas.

Half a century after the global energy crisis of 1973, a new energy crisis broke out on a global scale in the first quarter of 2022. Global natural gas prices in general, and in Europe in particular, increased sharply to a level 11 times higher than the level prior to the COVID-19 crisis, reaching $70 per MMBTU in Europe (Figure 1.13). In contrast,

[33] One of the publications showing that inflation harms mainly the weaker population groups is S. Albanesi (2007), "Inflation and Inequality", Journal of Monetary Economics, 54: 1088–1114. This paper discusses empirical findings that show a positive correlation between inflation and inequality. The paper also presents a theoretical model that explains the correlation as reflecting a causality that runs from inflation to inequality. The model is based on three main assumptions, under which low-income households are particularly vulnerable to inflation. The first is that the entire population is characterized by "exogenous" inequality in labor productivity, which is driven by the socioeconomic and institutional characteristics of the economy, such as access to public primary education. The second is that low-income households tend to manage their liquidity less efficiently than higher-income ones. The third is that political decisions regarding the mix of government revenues are made in a way that is biased toward debt financing, implying higher inflation than a mix that is more weighted toward taxes.

the weighted recognized cost per MMBTU produced by natural gas in Israel, which was $4.63 in 2021, remained virtually unchanged.[34] The increase in energy prices also encompassed oil and coal, but at lower rates than that of natural gas. Even though it seems that the acute stage has passed in Europe and fuel prices haves returned to their long-term levels, the impact of the crisis on the global energy markets may continue for a long time. The increase in energy prices was also reflected in general inflation in many countries (Figure 1.14). In Israel, the energy component increased more moderately, mainly due to the structure of the electricity market and the policy measures adopted, as described below.

Figure 1.13
Prices of the Main Fuels Used in Energy Production in Various Regions of the World, 2007–2022 (US$ per mmbtu monthly average)



SOURCE: FRED and EIA data.

The price increases encompassed all types of fossil fuels (oil, coal, and natural gas), and spread from Europe to the rest of the world.[35,36] There were disruptions in the supply of energy mainly in Europe, and particularly in the supply of natural gas, which is considered relatively nontradable because trade in natural gas is conducted mainly through pipelines, which leads to a separation of its international markets. This leads to price differences between various regions. In contrast, with regard to

[34] SOURCE: Electricity Authority Report for 2021. The details of natural gas contracts are protected by trade secrecy considerations, and the recognized cost is presented to the public only by gap and average.

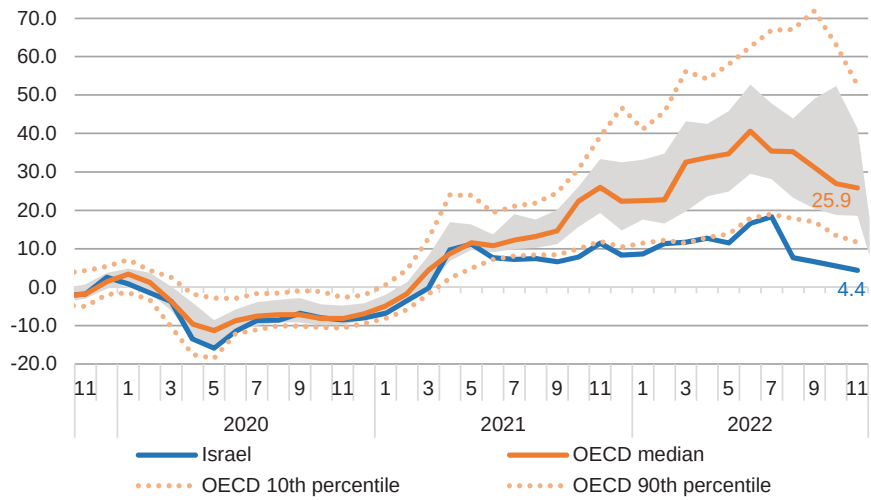
[35] The sharp increase in natural gas prices in Europe also affected the prices of renewable energy, which is an alternative energy source for electricity production, and the prices of solar and wind energy in Europe also increased sharply.

[36] The demand for natural gas in Europe and the price increase that it brought with it generated energy crises in many poor countries as well, including Thailand, Mexico, Pakistan, India, and Bangladesh.

The disruptions in the supply of energy were mainly in European countries, which receive natural gas through pipelines.

the prices of oil and coal, the shipping of which is not restricted only to neighboring countries, the differences between the various markets are mainly due to the quality of the fuel.[37] While the limited tradability of natural gas can be overcome by liquefying it (to LNG), this leads to higher prices due to the liquefying, shipping and gasifying process, and due to the high costs of the infrastructure necessary for the process. Since the planning and construction of this infrastructure also takes a long time, the capacity of the available infrastructure in the short term is rigid. As such, an increase in demand for natural gas may lead to a significant increase in its (regional) price. In the medium term, there is greater ability to increase the volume of this infrastructure. For instance, the energy crisis in Europe led to an acceleration of the construction of liquefying and gasifying facilities around the world, such as the facilities in Saudi Arabia and Qatar (liquefying) and in Germany (gasifying), which are expected to come on line this coming winter. However, even those possibilities are limited. In recent years, natural gas has accounted for about 15 percent of global consumption (about 500–600 BCM[38]) per year.[39]

Figure 1.14
Change in Energy Prices Based on Consumer Price Index, 2019–2022
(percent change relative to the same period in the previous year)



SOURCE: OECD.

Natural gas prices began increasing globally even in 2021, and after the war in Ukraine began, they jumped.

The increase in global natural gas prices began in 2021, before the Russia-Ukraine war, after disruptions in the supply of natural gas from Russia to Europe spiked the price in the EU to six times the average price from prior to the COVID-19 crisis.[40] In

[37] Before the crisis, the price of oil per energy unit was higher than that of natural gas or coal.
[38] Billion cubic meters.
[39] IEA, Gas market Report, 2022.
[40] The calculations here focus on the ratio between the price of an energy source at the end of 2021 and its average monthly price between 2017 and 2019.

the US, the price of natural gas increased by about 30 percent in 2021, and the global price of coal increased by about 90 percent, mainly since it is a tradable alternative to natural gas for producing electricity. The price of oil, which is less of an alternative to natural gas, increased by an average of just 20 percent globally relative to its 2017–2019 average.

Alongside disruptions in the supply of natural gas in Europe, there were also other significant supply and demand factors that contributed to the increase in global energy prices. These included the global economic recovery from the effects of the COVID-19 pandemic, which increased demand; disruptions in the production and shipping chains that led to increases in the global prices of coal and oil, similar to those of other commodities; low investment in the development of fossil fuel sources, out of feasibility concerns in view of international demands to transition to a carbon-free economy; and investors' demands for higher yields on their investments due to the wave of fossil fuel energy company bankruptcies during the COVID-19 period.[41] Following the Russian invasion of Ukraine in February 2022 and the sanctions that western countries imposed on Russia, the disruptions in the supply of natural gas from there worsened. At the peak of the crisis, in August 2022, natural gas prices climbed to a level 11 times higher than the average price in the years preceding COVID-19, which raised concerns over a deep economic crisis in Europe. In comparison, natural gas prices in the US increased by about 200 percent, and oil prices in the US increased by about 100 percent. The global price of coal increased fourfold. The increase in natural gas prices in Europe led to a transition to the use of other energy materials and to a diversion of LNG from global markets to Europe. This development, combined with a warmer-than-expected winter in Europe and energy-saving measures adopted there, moderated the increase in the price of natural gas and of energy in Europe and globally.[42]

Other than the disruptions in the supply of natural gas due to the war in Ukraine, there were other factors contributing to the increase in energy prices.

Israel and the crisis

In contrast with the sharp increase in global energy prices, and particularly those of natural gas in Europe, the higher global fuel prices had a relatively small impact on Israel. Since 2013, the government has adopted a series of policies to structure the domestic energy market. These have helped the economy contain the global shocks to natural gas prices, while maintaining orderly supply at low, and mainly stable, prices. Among the government's actions in the energy market, it is worth mentioning the formulation and implementation of the natural gas outline plan that ensures Israel a supply of natural gas from a number of separate fields. These fields today are responsible for more than two-thirds of Israel's electricity production. Moreover, the natural gas contracts signed between the domestic fields and the Israel Electric

A series of government actions to design the energy market since 2013 contributed to the fact that the energy crisis had a low impact on the Israeli economy.

[41] There were many other reasons for the increase in prices in 2021, including longer-than-expected maintenance disruptions at natural gas facilities in Norway, a colder-than-expected winter, and more.

[42] The fact that China, as a leading LNG consumer, was under broad lockdowns for most of the year due to COVID-19, helped this since it lowered Chinese demand for energy.

Company and private electricity suppliers are long-term contracts that are based on a fixed price formula that does not depend on global natural gas prices.[43] In addition, government decisions regarding natural gas exports from Israel ensured the supply of the necessary quantity of natural gas to the Israeli economy. That supply has also been further stabilized by advancement in the transition to zero-emission energy sources, which today account for about 8 percent of the country's electricity supply. However, it is important to note that price stability, which has helped the economy during the current crisis when global energy prices jumped, may lead to situations in which global natural gas prices are lower than prices in Israel. This has happened in the past.

Israel is currently connected to a number of natural gas reserves, which increases its competitive potential and its energy security.

In 2009, two large natural gas reserves were discovered in Israel. Today, they are known as the Tamar and Leviathan reserves. Later on, there were several additional smaller discoveries. According to commonly accepted assessments, Israel's natural gas reserves contain about 950 BCM. There are those who believe that Israel's territorial waters contain the potential for additional large gas discoveries. Production from the Tamar reserve began in 2013, and production from the Leviathan reserve began in 2020, some of which is for export to neighboring countries. At the end of 2022, production began from the smaller Karish and Tanin reserves, and Israel is now connected to a number of gas reserves. This increases the country's competitive potential and its energy security.[44] Natural gas production from these reserves totaled about 21 BCM in 2022, and according to assessments, production is expected to increase to about 45 BCM by 2030. For details on the tightening of economic ties between Israel and other middle eastern economies in general, and the energy agreements in particular, see the Box in Chapter 2.

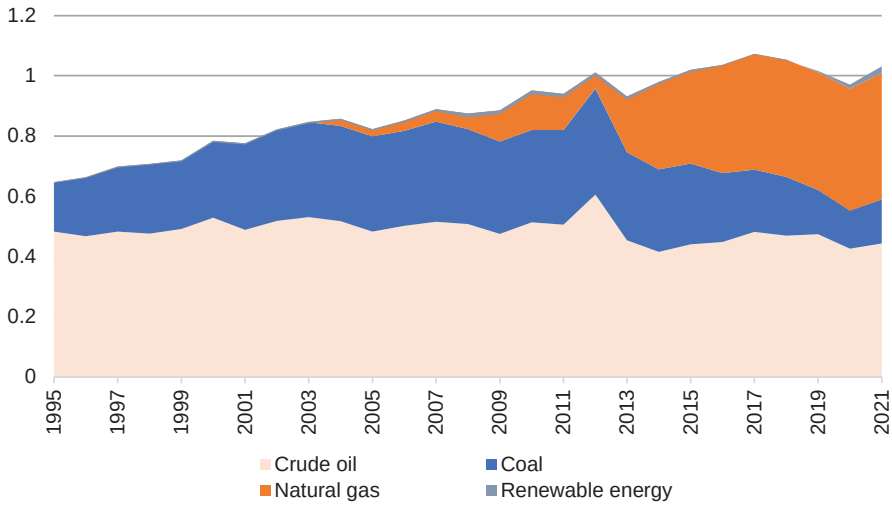
The main Israeli exposure to the energy crisis was due to the import of fuel for transportation and of coal for electricity.

Alongside the development of exports, Israel is still a net importer of fuels. Israeli exposure to the global energy crisis was due to fuel imports for use in transportation, and to the import of coal, which still accounts for about 23 percent of the mix of energy sources used to produce electricity (Figure 1.15). Coal is considered a highly polluting fuel per unit of energy produced. Reducing its use therefore has the potential to contribute significantly to reducing greenhouse gas emissions in Israel, and thereby to meeting Israel's commitments under international agreements on the matter. The natural gas discoveries in Israel, together with the government target of transitioning to a carbon-free economy, have led to a change in the mix of energy sources, and to a reduction in Israel's dependency on imported energy. The weight of coal in the mix of fuels used to produce electricity declined from a high of 60 percent before the discoveries, to about 23 percent in 2021, and according to the roadmap published by the Ministry of Energy, its use is expected to be eliminated completely by the end

[43] Some contracts do somewhat depend indirectly on global natural gas prices. These contracts include a component of indexation to the US Consumer Price Index. This index is influenced by energy prices, including natural gas prices in the US. The price of constructing facilities is also affected by global prices.

[44] There is also the possibility of a gasification boat which, although not necessary at this stage, will be able to add to Israel's energy security.

Figure 1.15
Consumption of Energy Products in Israel, 1995–2021 (billions of mmbtu)



SOURCE: EIA.

of 2025.[45] In parallel, the weight of natural gas in the production of electricity has increased from about 25 percent before the discoveries to about 70 percent, while renewable energy, which is also produced in Israel, and the production of which is also based on long-term contracts, currently accounts for about 8 percent of the mix.[46]

Gasoline prices in Israel increased by about 30 percent in 2022, similar to the rate in Europe and less than the rate in the US. This was due to taxes, which comprise a significant portion of the price in Israel and Europe, and which was reduced in Israel during the year as part of the government's response to price increases, as detailed below.

The excise on gasoline was reduced during the year, as part of the government's response to the increase in global fuel prices.

As stated, the energy crisis in Europe led to a sharp increase in global coal prices. The Israeli government's response to the increase in global energy prices helped reduce the increases in Israel. The cost of producing one kilowatt of electricity in Israel using coal reached 42 agorot in 2022, compared to 10 agorot in 2020 and 14 agorot when using natural gas. The latter remained constant thanks to long-term contracts on this energy source.[47] The Electricity Authority estimated that the higher cost of inputs justified an increase of more than 20 percent in electricity prices.[48] However, in order to moderate the impact to consumers, it decided not to roll over the entire price increase immediately, but to spread it out over a longer period of time. As Figure

[45] SOURCE: https://www.gov.il/he/Departments/publications/reports/energy_121021 (in Hebrew)

[46] However, the inputs for constructing facilities to produce renewable energy—wind turbines, solar panels, and energy storage batteries—are imported. When there is surplus demand globally for renewable energy, there may be difficulty in attaining them, and/or an increase in their price.

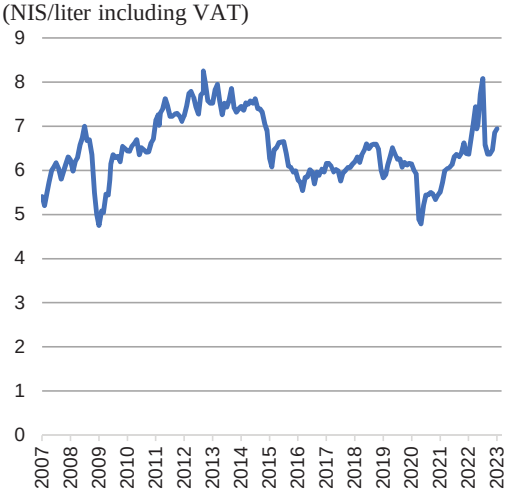
[47] See Noam Botosh, Review of the Electricity Market and the Factors Affecting Electricity Prices, 2023, Knesset Research and Information Center (in Hebrew).

[48] https://www.gov.il/he/departments/publications/Call_for_bids/shimshnati (in Hebrew)

In order to moderate the impact to electricity consumers, the Electricity Authority decided not to immediately roll the entire price increase over to consumers.

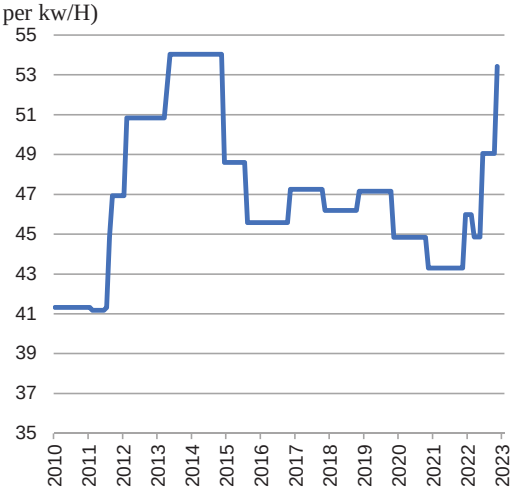
1.17 shows, the first increase in the price of electricity, 6.2 percent, was in February, and was partly offset by 2.4 percent in May due to a reduction in the excise on coal to near zero. The continued increase of global coal prices led to a further increase of 9.4 percent in August, bringing electricity prices close to their 2012 level, when they increased due to disruptions in the supply of natural gas from Egypt. The government recently extended the reduction in the excise, which moderated the increase in the price of electricity. Stopping the shock of the increase in electricity prices (an increase that later turned out to be temporary[49]) helped moderate inflationary pressures while taking a calculated risk on the basis of an assessment that the price increase in 2022 was largely due to temporary factors (See Chapter 3).

Figure 1.16
Price of 95-Octane Gasoline, 2002–2023
(NIS/liter including VAT)



SOURCE: Ministry of Energy.

Figure 1.17
Household Electricity Rates, 2010–2023 (agorot per kw/H)



SOURCE: Electricity Authority.

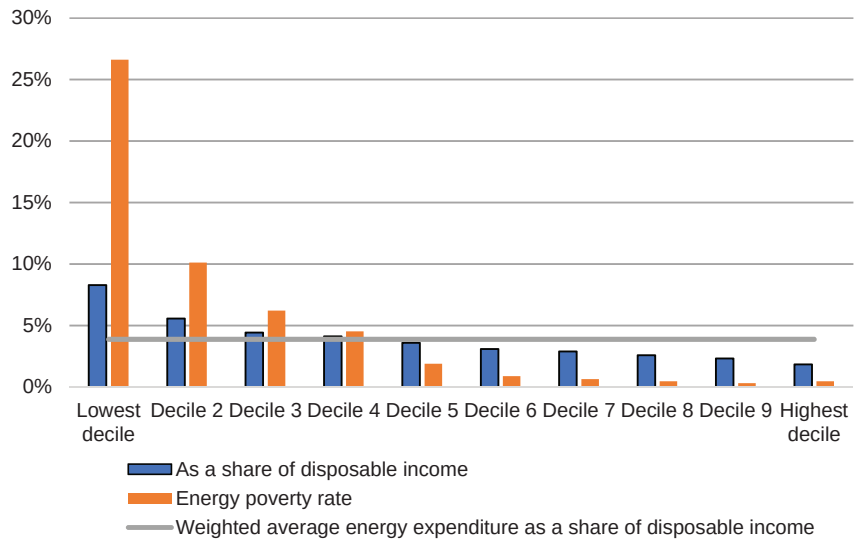
An increase of 20 percent in all energy prices could have increased household expenditures by almost one percent.

The direct effect of the increase in electricity prices in particular, and of energy prices in general, on households is relatively limited. Electricity prices in Israel are lower than in other countries, even though they include components that have to do with the reform in the Israel Electric Company, the financing of which is expected to end only in another three years. The weight of the entire energy market in Israeli GDP is about 3 percent. Expenditures on electricity as a share of disposable household income is about 4 percent. Of that, electricity accounts for about 2.5 percent of disposable income, which is similar to its weight in the Consumer Price Index. As such, an increase of about 20 percent in all energy prices, which is consistent with the Electricity Authority's assessments, would have directly contributed slightly less

[49] The average price of coal increased in 2022 to more than four times the average price from 2017 to 2019 and more than twice the price at the end of 2021. The price then declined sharply at the beginning of 2023. At the end of 2022, the price was similar to its level at the end of 2021, although it remained significantly higher than the 2017–2019 average.

than 1 percent to household expenditures and to the Consumer Price Index. By way of comparison, in Europe, the crisis led to an average increase of about 7 percent in household expenditures, and in some cases the increase reached about 20 percent.[50] Even though its average level is low, it should be emphasized that energy expenditures as a share of households' disposable income varies between income deciles—it is higher among the lower income deciles. Figure 1.18 shows these data, as well as an index of energy poverty. We classify a household as suffering from energy poverty if its expenditure on electricity exceeds 10 percent of its total expenditures.[51] The Figure shows that in the lowest decile, more than one-quarter of households suffer from energy poverty[52], so the price's impact on their expenditure decisions may be greater than in other households.

Figure 1.18
Energy Expenditures as a Share of Disposable Income, and Energy Poverty, by Income Decile, 2019



SOURCE: Based on Expenditure Survey.

Alongside the benefits of cancelling the excise for mitigating the shock from the crisis, the process does not come without damage, since the tax is intended to price in externalities that have to do with congestion and emissions of poisonous gasses

[50] https://www.imf.org/en/Publications/fandd/issues/2022/12

[51] We define energy poverty here according to the Ministry of Welfare's definition. The definition of energy poverty in the literature is not uniform. For instance, Hanin, Teshler, and Shapira (2022) use this term to describe households' consumption characteristics, such as direct connection to the national electricity grid, generators, and the use of more traditional energy sources. The term also refers to subjective assessments regarding a lack of security in the supply of energy, particularly electricity.

[52] Meaning about 2.5 percent of all households in Israel.

Cancelling the excise on fossil fuels is not without harm.

and greenhouse gases, and to incentivize the transition to a zero-emission economy. Moreover, the total excise constitutes about 11 percent of total indirect taxes in Israel. The cost of reducing the excise on coal in 2022 is estimated at about NIS 470 million. The cost of lowering it on gasoline is estimated about NIS 1.8 billion, and lowering it on diesel is estimated to cost about NIS 560 million.[53] The total amounts to about 0.2 percent of GDP. In addition, the government adopted a number of policy measures to help households, which were attributed to dealing with higher prices in the economy as a whole, including energy price increases. These totaled about 0.5 percent of GDP. (See Chapter 6 in this Report.)

Governments in Europe also worked to moderate the impact of higher energy prices on households and on the economy as a whole, but expenses there averaged almost four percent of GDP, and in some countries reached as high as 9.3 percent of GDP.[54]

The policy measures taken in recent years form the basis of the Israeli energy market's robustness, which was revealed during the recent energy crisis. Thanks to these measures, Israel now enjoys a functioning and competitive natural gas market and a robust energy market. Alongside this, the need to diversify and expand our energy sources, mainly the need to increase the share of renewable energy in the mix of energy sources in Israel, remains. The crisis this year clarified that advancing the transition to domestic natural gas in electricity production, while also gradually advancing renewable energy, contributed to Israel's energy independence and to the domestic energy market's robustness in the face of global price shocks. Europe's desire to disconnect from dependence on Russian gas and to divert European demand for energy to other sources raises the need to rethink the possibility of expanding the search for other energy sources. It also raises the need to examine the economic feasibility of establishing the Eastmed pipeline to transport gas to Europe and/or building natural gas liquefying facilities in Israel, while also keeping natural gas for the domestic market to ensure Israel's energy security.

The import of oil for transportation needs currently remains the main source of the energy market's exposure to external shocks. Further reducing Israel's exposure to imported energy sources and to fluctuations in the global energy market must be based mainly on transitioning from vehicles with internal combustion engines, which require imported oil, to electric vehicles, which consume energy from the mix of sources that are used to produce electricity. While this stage is still in its infancy, it is clearly gaining momentum, and its continued development will require a supportive government policy.[55]

[53] SOURCE: Calculations by the Ministry of Finance Chief Economist.
[54] For more details, see Chapter 6 of this Report.
[55] For details on the Bank of Israel's policy recommendations regarding the environment and energy, see: https://www.boi.org.il/en/communication-and-publications/press-releases/the-bank-of-israel-s-program-to-accelerate-economic-growth-recommended-strategic-pillars-of-action-for-the-government/