Chapter 1

The Economy and Economic Policy

- The Israeli economy grew by 3.3 percent in 2018, in line with the potential growth rate, and slightly lower than growth of the past two years. Per capita GDP increased by 1.3 percent. Total uses increased by a higher rate than GDP, which was reflected in a more rapid expansion of imports than of GDP.
- The economy is in a full employment environment. The convergence to full employment is reflected in a continued decline of the unemployment rate in recent years, alongside high demand for workers and an attendant continued increase in wages.
- Annual inflation increased to within the target range during the year, following four years in which it was lower than the target. The increase in inflation was supported by an increase in the unit labor cost in view of the full employment environment, an increase in the price of oil, and the depreciation of the shekel. At the end of the year, inflation was 0.8 percent—slightly below the lower bound of the price stability target. However, at the beginning of 2019, the annual inflation rate returned to within the target range.
- The Bank of Israel left the interest rate at 0.1 percent for most of the year, in order to return inflation to the target range and entrench it within the range, and to support economic activity. The increase in the inflation environment to within the target range, alongside improved economic activity, led to an increase in the Bank of Israel interest rate to 0.25 percent after almost 4 years in which it had remained at 0.1 percent. The increase in the interest rate at the end of the year joined a trend of reducing monetary accommodation in other countries.
- In 2018, the shekel depreciated in real terms following years in which it was appreciated. The Bank of Israel's foreign exchange purchases in 2018 were (starting in February) only within the program to offset the effect of natural gas production on the exchange rate, and toward the end of the year, the Bank announced that the program would be brought to an end.
- Fiscal policy in 2018 was expansionary, further to previous years, and since there were no unusual one-off revenues this year, the expansionary policy was reflected in a sharp increase in the budget deficit and a halt to the downward trend in the debt to GDP ratio.
- Home prices declined this year, for the first time following a decade of rapid increases. The increase in the supply of dwellings, thanks to accelerated construction in previous years and measures taken by the government on the demand side, acted to halt the price increases, but in the past two years, the number of building starts has declined.
- A number of reforms intended to increase competition in the credit market came to fruition this year.
- Increased employment and wages, particularly among households from the lower income quintiles, contributed to a continued decline in the incidence of poverty and inequality.
- Per capita GDP is low by international comparison, and demographic and other processes are expected to slow the growth rate in the coming decades. In order to support a continued increase in the standard of living and a narrowing of the gap between Israel and other advanced economies, it is necessary to institute policy measures that support an increase in labor productivity, improved infrastructure, an improved business environment, and increased labor force participation among sectors with low participation rates—which will require the adaptation of their human capital to the needs of the labor market.

1. MAIN DEVELOPMENTS

a. Economic activity and the labor market

The Israeli economy grew in 2018 at a rate that is consistent with its potential growth rate.

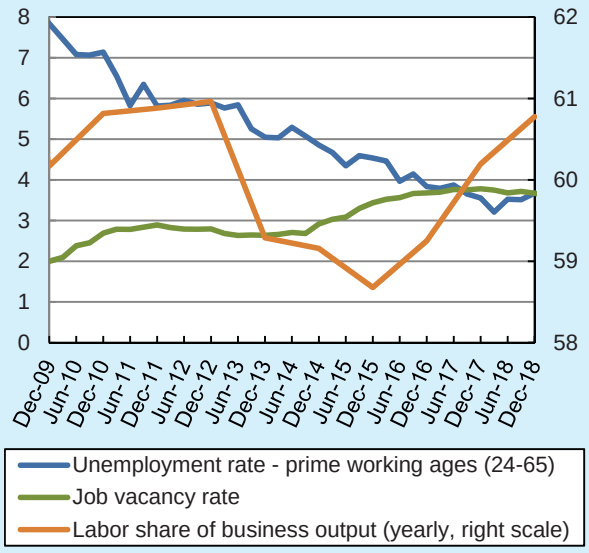
The Israeli economy grew by 3.3 percent in 2018—a rate that is in line with the potential growth rate—and per capita GDP grew by 1.3 percent. The labor market is close to full employment, and as such, wages have increased strongly for a number of years. The rise in real wages, alongside greater employment in recent years, increased households' real income—i.e. their purchasing power. The increase in real wages in recent years reflects an increase in the nominal wage and a more moderate rise in the Consumer Price Index, inter alia due to measures taken by the government to lower the cost of living.

The economy's growth rate in 2018 is consistent with assessments regarding its potential growth rate at this time[1], and a level of activity that is close to potential, as reflected in the tight labor market. The rapid increase of capital investments in the past two years (as well as indications of the utilization of capital in manufacturing, provided by the Companies Survey) hints that in addition to the tight labor market, the utilization of capital is also high.

The full employment environment was reflected in a rapid increase in wages.

The process of drawing close to full employment in recent years has been reflected in a continued decline in the unemployment rate to a historically low level, alongside a high job vacancy rate—evidence of high demand for workers (Figure 1.1). Despite the high demand for workers, the growth rate in the number of employed persons has moderated—a development that is consistent with difficulty in recruiting

Figure 1.1
Unemployment Rate, Job Vacancy Rate, and Labor Share of Business Sector Output, December 2009 to December 2018 (percent)



SOURCE: Based on Central Bureau of Statistics.

[1] The potential growth rate (as per the production function approach) is the growth rate that is consistent with the maximum sustainable utilization of available means of production—the supply of labor and the stock of capital—and the rate of increase in total productivity that is consistent with the multi-year average. The potential growth rate in recent years has been estimated at about 3.3 percent. See Table 2.9 in Chapter 2.

appropriate workers. On the price side, the proximity to full employment has been reflected in a continued increase in wages (nominal and real), led by wages in the business sector.

The growth rate slowed slightly relative to the previous two years.

The growth rate of the economy moderated slightly in 2018 relative to the previous two years.[2] The growth rate in the previous two years was slightly higher than the potential rate, while in 2018 it was consistent with the potential.[3] GDP growth in line with the potential rate in 2018 is consistent with the full employment environment.

From the standpoint of demand, the moderation of the growth rate in 2018 relative to 2016–17 reflected a slowdown in the growth of domestic uses[4]—particularly investment in residential construction, which declined markedly, reflecting the continued decline in the number of building starts in the past two years. The growth rate of private consumption, which was high in the past two years, also moderated slightly. Such a moderation from a rapid growth rate is consistent with the economy drawing close to full employment, accompanied by moderation in the increase of employment. The increase in consumer prices this year also acted to moderate the growth rate of consumption.[5],[6] Still, private consumption increased solidly in 2018, by 3.9 percent—higher than the growth rate of GDP.

In terms of the increase of uses, the distribution between domestic uses and exports was quite balanced in 2018. Domestic uses grew by 3.4 percent, while exports (excluding diamonds and startups) increased by 4.2 percent, similar to the growth rate of world trade. Services exports, particularly business services and tourism services, increased solidly, while goods exports continued to stagnate. This is characteristic of a structural change in the composition of the economy's exports in recent years—transitioning from goods exports to services exports.

The slowdown in the growth rate during the year, particularly in the growth of (current) private consumption, alongside some increase in the unemployment rate from the low rate it had reached, raised the possibility that demand factors were acting to slow economic activity to below the potential growth rate. Developments in the global economy this year—increasing uncertainty, the slowdown in the growth of world trade, and the moderation in the growth rates of some economies (see Section

[2] GDP increased by an average annual rate of 3.7 percent in 2016 and 2017, while business sector product increased by 3.9 percent. The averaging smooths fluctuations that are connected to the significant fluctuations in vehicle imports during those years. In 2018, both increased by 3.3 percent.

[3] See estimates in Table 2.9 in Chapter 2, according to which the output gap, which was negative in 2015, narrowed to near zero. According to OECD estimates, the output gap in Israel in 2015 was near zero, and became positive in the following years.

[4] While the growth rate of exports (excluding diamonds and startups) was high in 2017, it followed weakness in 2016.

[5] See more discussion in Chapter 2. As we will see below, inflation in recent years was low due to "supply factors" (particularly measures taken by the government to lower the cost of living, a sharp decline in oil prices between 2014 and 2016, and the appreciation of the shekel). The price declines increased purchasing power, thereby contributing to increased private consumption.

[6] It is also likely that the moderation in housing market activity (Chapter 9) was associated with a moderation of demand for complementary durable goods. See the discussion on private consumption in Chapter 2.

2 below)—may have contributed to the moderation of the growth rate in the Israeli economy as well during the year. The decline in investment in construction was also a contributing factor. However, higher figures on economic activity in the fourth quarter strengthened the assessment that the economy is growing at a rate close to its potential growth rate.

The growth rate of imports was higher than that of GDP.

The growth rate of imports—as well as total uses—in the past three years (2016–18) was higher than that of GDP. The rapid expansion of imports relative to GDP since 2016 was supported by the continued trend of appreciation of the shekel in the

Table 1.1
Main Developments, 2013–18

	2013	2014	2015	2016	2017	2018
Population (yearly average, million)	8.1	8.2	8.4	8.5	8.7	8.9
Nominal GDP (NIS billion, current prices)	1057.7	1109.2	1167.9	1226.6	1271.6	1327.4
Per capita GDP (NIS thousand, current prices)	131.3	135.1	139.4	143.6	146.0	149.5
Goods and services exports ($ billion, current prices)[a]	89.5	91.1	86.8	88.2	96.6	103.8
Goods and services imports ($ billion, current prices)[a]	85.0	86.2	78.2	83.2	91.7	102.2
Current account of the balance of payments (surplus, $ billion)	8.4	13.7	16.1	12.3	10.1	11.0
Overall government deficit[b]	4.4	2.7	1.6	1.9	1.9	3.8
Public debt[b,c]	67.0	65.8	63.7	62.0	60.5	61.0
Employed persons in Israel (thousands)	3449.5	3555.8	3643.8	3736.8	3824.8	3905.1
Real wage per employee post[d]	0.9	1.1	2.9	2.8	2.8	2.7
Nominal yield on 10-year government bonds[e]	4.0	3.1	2.2	2.0	2.1	2.2
Real yield on 10-year government bonds[e]	1.6	1.0	0.5	0.4	0.6	0.5
GDP[f]	4.3	3.9	2.6	4.0	3.5	3.3
Private consumption[f]	3.7	4.3	4.1	6.4	3.4	3.9
Unemployment rate[e]	6.2	5.9	5.2	4.8	4.2	4.0
Exports (excluding diamonds)[f]	4.4	2.8	-1.4	0.9	7.0	4.8
Inflation[g]	1.8	-0.2	-1.0	-0.2	0.4	0.8
Bank of Israel interest rate[e]	1.4	0.6	0.1	0.1	0.1	0.1
Real one-year interest rate[e]	-0.3	-0.7	-0.5	-0.1	-0.1	-0.8
Real effective exchange rate[d]	-5.7	-1.3	-0.6	-1.9	-4.5	2.1
NIS/$ exchange rate (yearly average)	3.6	3.6	3.9	3.8	3.6	3.6
Tel Aviv 125 index[h]	15.1	6.7	2.0	-2.5	6.4	-2.3
Global trade[f]	3.6	3.8	2.8	2.2	5.3	4.0

[a] Excluding diamonds.
[b] As a percentage of GDP.
[c] Excluding local authorities' debts to the government.
[d] Yearly average, percent rate of change.
[e] Yearly average, percent.
[f] Percent rate of change.
[g] December compared to the previous December, percent.
[h] 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.

past decade, which reflects the decrease of prices of imported products relative to the prices of domestically-produced products. This trend was halted in 2017, and there was even a real depreciation in 2018 (see below). The rapid expansion of imports relative to GDP is consistent with the economy's proximity to full employment, and contributed to the narrowing of the surplus in the goods and service account of the balance of payments. In 2018, the narrowing of this surplus was also a result of a worsening of the terms of trade, particularly an increase in energy prices. (For details, see the discussion and Figure 2.13 in Chapter 2.)

b. Inflation and the exchange rate

Inflation increased to within the price stability target range.

The economy's proximity to full employment supported an increase in inflation. Inflation of the Consumer Price Index has increased gradually since 2016[7], a trend that was typical of both the tradable and nontradable components of the CPI (Figure 1.2). Annual inflation increased from -1 percent at the end of 2015, and entered the price stability target range in June 2018, after having been below the lower bound of the range for four years (and negative for about two years). The annual inflation rate increased from 0.4 percent at the end of 2017 to 1.3 percent in June 2018, and remained stable in the lower portion of the target range between June and November. In December, inflation declined slightly—led by the tradable component, and particularly the sharp decline in oil prices in that month—so that the annual rate for 2018 was 0.8 percent, slightly below the target range. The decline in December turned out to be temporary, as the annual inflation rate was again within the target range in January and February of 2019.

The upward trend of inflation is consistent with the economy's proximity to full employment.

The upward trend of inflation, and particularly of inflation of nontradable goods prices, is consistent with the continued increase of wages in view of the economy's proximity to full employment, which was reflected in an increase in the GDP labor share beginning in 2015 (Figure 1.1). As Figure 1.2 shows, the annual rate of inflation of nontradable goods prices excluding the housing component has been in a moderate upward trend since 2015 (even though it declined during 2017, which was shown in retrospect to be temporary), and stabilized in the lower portion of the target range from June 2018.

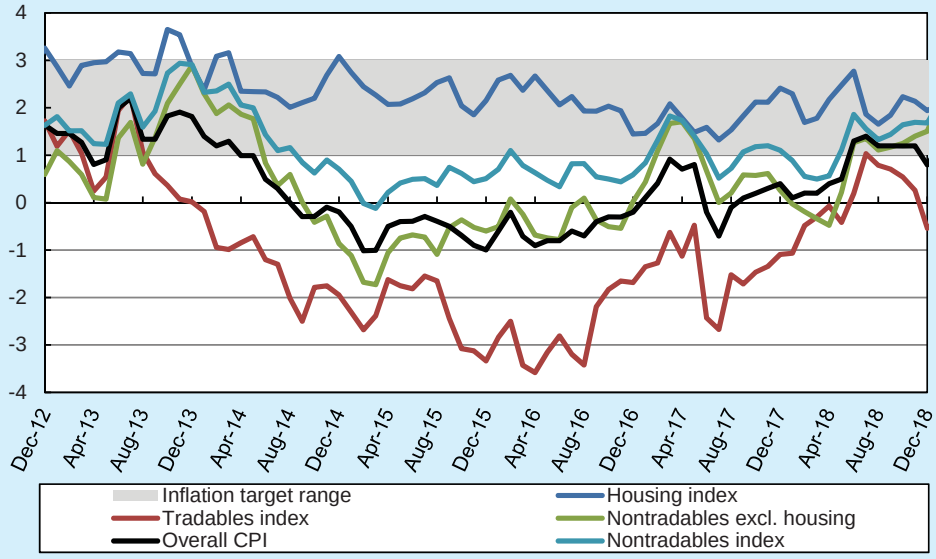
The decline in the prices of tradable goods moderated significantly since 2016, partly due to the increase in oil prices.

Alongside the gradual upward trend of inflation in the prices of nontradable goods and services, the decline in the prices of tradable goods moderated significantly beginning in 2016. This was partly due to a significant increase in oil prices beginning in 2016, after they declined in 2014 and 2015.[8] The inflation rate of "other tradable

[7] While it declined in the first half of 2017, this was shown in retrospect to be a temporary fluctuation.

[8] Oil prices increased sharply from the beginning of 2016 until October 2018, after falling from mid-2014 until the beginning of 2016. From the first quarter of 2016 until the third quarter of 2018, the price of oil more than doubled (from a low of $35 per barrel to $76 in quarterly averages). In the fourth quarter of 2018, oil prices fell by about 10 percent (quarterly average compared with the previous quarter), with the volatility that gripped the financial markets during that quarter, contributing to a moderation of inflation.

Figure 1.2
Inflation in the Overall CPI and in the Tradable and Nontradable Components, December 2012 to December 2018 (12-month rate of change, percent)



SOURCE: Based on Central Bureau of Statistics.

goods" (excluding energy prices) also increased markedly compared with previous years, since there were moderate price declines in 2018 following more significant declines in previous years (Figure 3.6 in Chapter 3). This development was supported by the shekel's depreciation against the US dollar in 2018 and the rise in global inflation.[9] However, inflation in the prices of tradable goods moderated in the second half of the year, partly due to the sharp decline in oil prices during the fourth quarter.

The low inflation in the prices of tradable goods (particularly compared to inflation in the nontradable component—that is, decline in the relative price of tradable goods compared with nontradable goods) has been a global phenomenon in recent years. This can be attributed partly to the globalization process and the lowering of the costs of production with the transition to manufacturing tradable goods in emerging economies, and to technological developments that have made it easier to compare prices and facilitated online shopping.[10] In Israel, the appreciation of the shekel and measures to increase competition—particularly from imports, including the lowering

[9] The shekel depreciated against the dollar by about 7 percent in 2018 (December average compared with the previous December's average), in contrast with an appreciation of about 8.5 percent in 2017. In terms of the nominal effective exchange rate, the differences were less marked—a depreciation of 2.3 percent in 2018 compared with an appreciation of 3.9 percent in 2017. As we have previously shown, in Chapter 3 of the Bank of Israel *Annual Report* for 2017, the dollar's effect on import and export prices is larger than its weight in the effective exchange rate.

[10] See, for instance, Box 1.2 in the April 2018 World Economic Outlook, which shows that in the advanced economies, core inflation for goods has been lower than core inflation for services for years. However, the *decline* in inflation in recent years was actually in services.

of customs fees—also contributed to the decline in tradable goods prices in recent years.

More volatile components were also factors in the increase in inflation in Israel in 2018, particularly energy prices and the prices of fruit and vegetables. However, the increase in inflation and its stabilization around the lower bound of the target range are also clear from the indices of "core inflation" (and particularly inflation of the CPI excluding energy, fruit and vegetables)[11], which is consistent with the interpretation that the increase in inflation reflects fundamental economic forces.

In contrast with the trends and fluctuations in the prices of tradable goods and nontradable goods excluding housing, the housing component of the CPI (rents) increased by a relatively stable annual rate of around 2 percent in recent years, following more significant increases in previous years. This is in contrast with the continued rapid increase of home prices during that time (until the last year).

In recent years, inflation in Israel was lower than in other OECD countries, influenced by supply factors.

In recent years, inflation in Israel has been lower than inflation in other OECD countries (Figure 1.3, and Figures 3.10 and 3.11 in Chapter 3). This is even though the output gap (actual GDP relative to potential GDP) in Israel was relatively high, private consumption increased more rapidly, and wages—hence the unit labor cost—increased by higher rates (Figure 1.3). These findings are consistent with the assessment that the relatively low inflation in Israel reflected the effects of supply factors—including government measures to support the lowering of the cost of living in Israel, particularly in the years following the social protest of 2011.[12] Beyond the impact of specific measures, it seems that consumer awareness and sensitivity to price rises increased during those years, which might have made it difficult for firms to raise prices.

The moderating effect of supply factors on prices can explain the relatively low level of inflation (below the target range or close to its lower bound)—particularly in the nontradable component—despite the rapid increase in wages and in unit labor cost. Figure 1.1 shows the labor share of business sector output, which is the ratio between the unit labor cost (the cost of labor per unit of output) and the price per unit of output. As the figure shows, the labor share has increased since 2015, as the economy drew closer to full employment.[13] As the labor share—the cost of labor relative to output prices—increases, profit (price relative to cost) declines[14], creating upward pressure on prices. However, if the increase in the labor share in recent years reflects

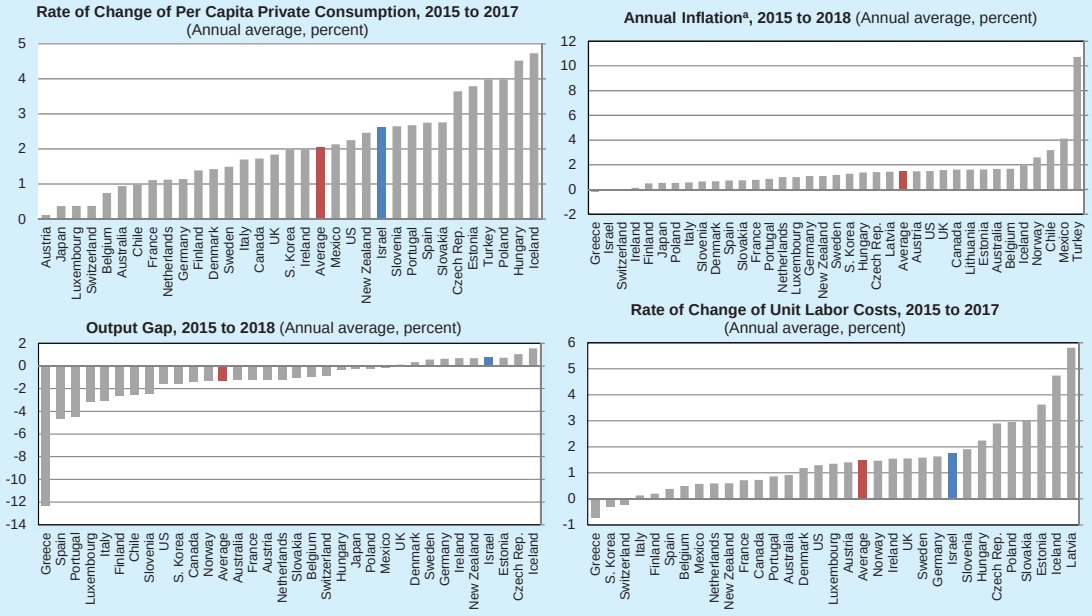
[11] See Figure 3.2 in Chapter 3 of this report ("Core indices").

[12] These include measures to enhance competition in the communications field, the "Open Skies" reform, leniencies on personal imports of consumer goods, the reform on standards approval for imported products, and the lowering of customs duties and purchase taxes. For details of the measures to remove import barriers, see Chapter 7 of this report, and discussions in Chapters 1 and 3 of the Bank of Israel Annual Reports for 2016 and 2017.

[13] In 2018, the GDP labor share returned to its 2009–2012 levels, meaning that it was higher than in 2015, but it remained lower than it was prior to the crisis (2006–07). The development of the GDP labor share over the years is discussed in Chapter 5 of the Bank of Israel *Annual Report* for 2017.

[14] As long as there is no parallel decline of another component of the costs of production that offsets the effect of increased labor costs.

Figure 1.3
Inflation, Economic Activity, and the Cost of Labor, Israel and the Other OECD Countries



[a] Rate of change of the annual average of the monthly indices.
SOURCE: Based on OECD.

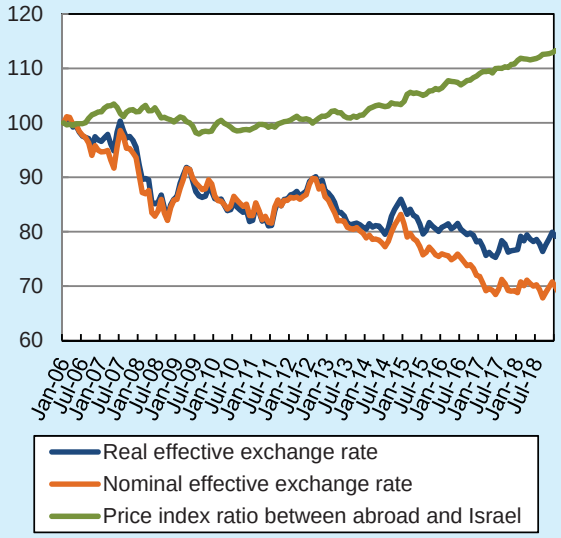
(at least partially) a structural change that acts to lower profitability in sectors where there was insufficient competition, we would not expect that a decline in profitability would lead to price increases to the same extent. This is because such a structural change prevents firms from raising prices in order to correct for declining profits. However, as wage increases persist and profitability declines, it becomes harder for firms to absorb the higher costs of production without raising prices. Therefore, the increasing costs are expected to lead to price increases at some stage. It is therefore likely that the cumulative increase in wages in recent years was a cause of the increase in inflation in 2018.

The increase in competition may explain the concurrence of moderate inflation with a high level of economic activity and a tight labor market.

The process of enhancing competition is acting to lower inflation, and in parallel to increase economic activity and the tightening of the labor market. When there is low competition, manufacturers charge relatively high prices, leading to lower quantity of demand than in a situation of high competition. Enhanced competition reduces markups and leads to increased quantity of demand, and the increase in the quantity produced is reflected in an increase in demand for workers in the labor market. This dynamic may be one of the reasons for the confluence of a high level of economic activity and a tight labor market with relatively low inflation. This process has the character of a supply shock, which is reflected in a negative correlation between activity and prices, in contrast to a demand shock, which causes quantities and prices to move in the same direction. Box 1.1 discusses the ramifications of such a shock on monetary policy.

Inflation in Israel was lower than in other countries in recent years, but the nominal appreciation of the shekel lowered foreign prices in shekel terms. Thus, until 2017,

Figure 1.4
The Real Effective Exchange Rate and its Components, January 2006 to December 2018
(Index: January 2006 = 100)



SOURCE: Bank of Israel calculations based on Central Bureau of Statistics.

prices in Israel continued to rise relative to global prices when denominated in the same currency (real appreciation—Figure 1.4).[15] The real appreciation of the shekel was supported by the relatively rapid growth of per capita GDP in Israel from the mid-2000s (Figure 1.5). The trend of appreciation changed in 2017, since which time the nominal effective exchange rate has remained relatively stable, and there was even some depreciation in terms of the real rate. However, the real exchange rate remained at historically low levels.

The nominal and real appreciation trends were halted in 2017.

c. Credit and the housing market

Private sector debt (households and the business sector) increased by 6.0 percent in 2018, mainly due to increased business sector debt and increased housing debt. The business sector debt to GDP ratio stabilized in recent years, after a significant downward trend since 2008. The ratio declined from 93% in 2008 to about 69% between 2015 and 2018—a relatively low rate by international comparison. The decline in the rate of business sector debt since 2008 is explained by, among other things, the reduction in supply of bank credit to large businesses (in view of regulatory changes among other things), structural changes in the industry composition of the economy (an increase in the weight of trade and services companies and a decline in the weight of manufacturing and agricultural companies), a decline in the expansion of holding companies as per the Concentration Law, and an increase in internal sources of financing.

Business sector debt increased markedly in 2018.

The relatively high growth rate of business sector debt in 2018 (6.8 percent) was partly a result of credit to companies in the construction industry, in view of regulatory leniencies that enabled an increase of bank credit to the industry. On the demand side, the decline in the number of new home sales in recent years increased the need

[15] The appreciation exceeded the difference between the inflation rate in Israel and the higher inflation rate among its trading partners.

of construction companies to obtain external financing, and demand for credit to purchase land increased.

Housing debt continued to increase markedly, while the growth rate of nonhousing debt moderated significantly.

Household debt increased by 4.9 percent in 2018, similar to its pace of growth in 2017, and slightly lower than the high rate in previous years. Household debt grew rapidly in recent years, supported by accommodative monetary policy, but its level as a share of GDP is low by international comparison. The mix of credit taken out by households changed in 2018, as the growth rate of nonhousing credit declined markedly, while the growth rate of housing debt accelerated. In the background of this change, there were regulatory leniencies in housing credit that enabled its growth, alongside measures to moderate the increase of nonhousing credit. (For more information on the credit market, see Chapter 4.)

A number of reforms intended to increase competition in the credit market came to fruition in 2018.

In 2018, a number of reforms and significant measures intended to enhance competition in the household and small business credit market came to fruition. These measures have already begun leading to an increased number of players in the market, and their effects are expected to increase in the coming years. The separation of credit card companies from the banks is expected to lead to new players joining the retail credit market, and a number of entities received merchant acquirer licenses from the Banking Supervision Department in the past year. The central credit register that will be launched in April 2019 will reduce the asymmetry of information, and enable lenders to compete with each other by providing credit offers to households that are adjusted to their risk level, based on common information. Projects being advanced by the Bank of Israel and the Ministry of Finance, such as "open banking", "transitioning from bank to bank", and a "computer services bureau" will further enhance competition in the coming years, and will support the entry of additional players into the market.

The rapid increase of home prices was halted in 2018. However, the number of building starts declined after years of continued increases that acted to moderate prices.

The trend in the housing market changed in 2018. After about 10 years of rapid increases in home prices, prices declined at a moderate rate in 2018. The halt in the increase in home prices is related to both the supply side and the demand side. On the supply side, the government took measures that led to a marked increase in the number of building starts in the past decade. On the demand side, there were measures that led to a decline in home purchases, mainly by investors. However, the number of building starts declined in the past two years. In view of demographic developments expected in the coming years[16], it is necessary to support an increase in the stock of homes in high-demand areas, while also dealing with barriers that restrict demand for residences in additional areas.

The number of home transactions in 2018 was similar to the number in 2017, and lower than in 2015 and 2016. The number of purchases by investors and those upgrading their housing continued to decline, while the number of first-time purchases remained high, some of which were part of the "Buyer's Price" program. The number of new homes sold continued to decline in 2018, and is significantly lower than it was in 2015 and 2016.

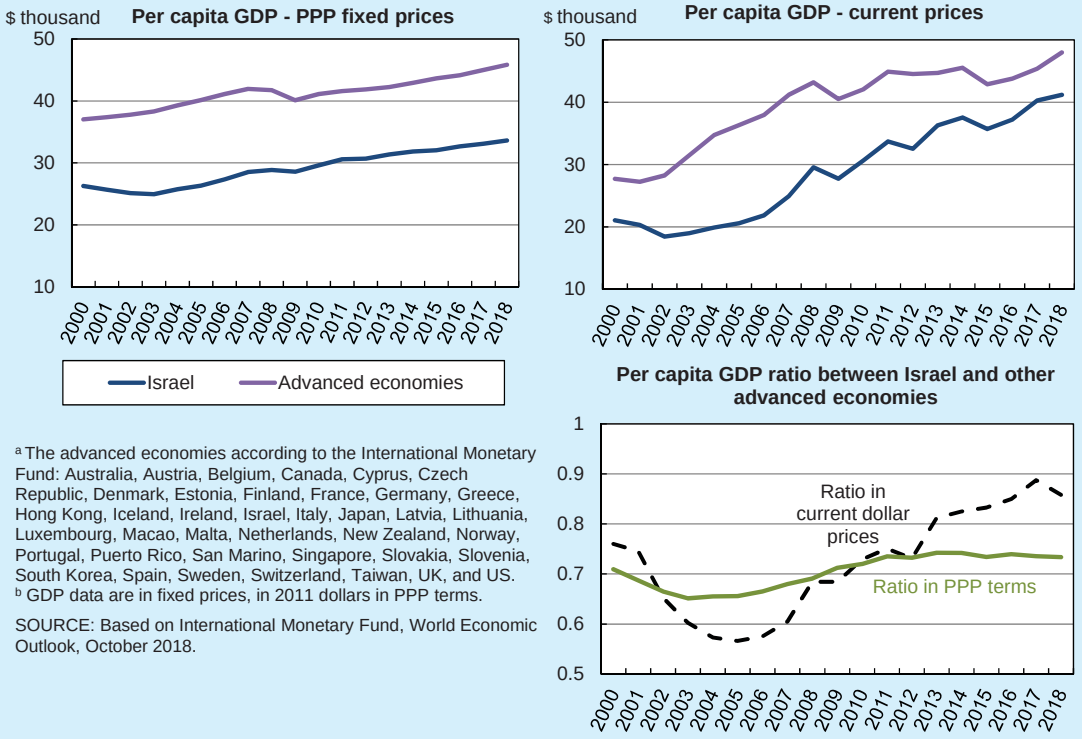
[16] According to assessments within the Strategic Housing Program. See Chapter 9.

d. Per capita GDP, inequality, and long-term growth

Per capita GDP in Israel is lower than in other advanced economies, and the gap did not narrow in recent years.

The standard of living in Israel is steadily increasing, as reflected in the growth of per capita GDP. However, per capita GDP in Israel (in PPP terms) remained low compared to other advanced economies, and the gap has not narrowed in recent years (Figure 1.5). Israel's disadvantage in per capita GDP largely reflects the relatively low level of labor productivity in Israel. Demographic factors, which were reflected in a decline in the working-age population as a share of the total population in Israel (an increase in the dependency ratio), widened the gap in per capita GDP between Israel and the other advanced economies in recent years. In contrast, the relatively rapid growth of the employment rate in Israel served to narrow it.[17]

Figure 1.5
Per Capita GDP in Israel Compared with Other Advanced Economies[a], 2000 to 2018



[a] The advanced economies according to the International Monetary Fund: Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Macao, Malta, Netherlands, New Zealand, Norway, Portugal, Puerto Rico, San Marino, Singapore, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, UK, and US.
[b] GDP data are in fixed prices, in 2011 dollars in PPP terms.

SOURCE: Based on International Monetary Fund, World Economic Outlook, October 2018.

The multi-year growth rate declined in recent years, from 4 percent to 3.3 percent, due to the decline in the growth rate of the prime working-age population, and the decline in the contributions to growth made by the increase in the participation rate and the increase in education.[18] An analysis by means of a model for forecasting

[17] For more discussion of labor productivity by international comparison, see Chapter 5. For more discussion on the dependency ration, see Chapter 2.

[18] The negative effect of the demographic changes on the growth rate was expected, as outlined in Chapter 1 of the Bank of Israel *Annual Report* for 2011 (pp. 34–35).

In order to support a prolonged increase in the standard of living, the government must adopt an active labor integration policy toward population groups with low participation rates, and act to improve the quality of human capital, the level of infrastructure, and the business environment.

the long-term growth of the Israeli economy shows that these factors are expected to lead to a further decline in the growth rate. In order to maintain, and perhaps increase, the growth rate despite these factors, the government must adopt an active policy to integrate population groups with low participation rates in the labor market, mainly Arab women and ultra-Orthodox men. The government must provide them, and the rest of the population, with the basic skills necessary for high-paid work, by encouraging the study of a core curriculum and by improving the quality of instruction, particularly in schools with student populations from weak backgrounds. It is also important to improve the business environment and to raise the level of infrastructure so that it will enhance competition in the economy and assist workers in maximizing their capabilities. An analysis using the growth forecast model shows that these measures are essential for Israel to close the gap in the standard of living between it and the other advanced economies, since implementing them may have a marked impact on growth. Section 4 below provides an analysis, through that model, of the factors that are expected to have an impact on the growth rate, and details the policy required to increase it.

Inequality and the incidence of poverty declined, but remained high by international comparison.

The inequality in net household income, and the incidence of poverty, declined in 2017, but remained high by international comparison. These declines were achieved mainly due to the expansion of employment and to the rapid increase in wages in the low income quintiles. The high income inequality in Israel is joined by marked differences in the quality of education and in skills, which are correlated with socioeconomic level.[19] These have a negative impact on both the future standard of living in the economy, and on the country's social strength.

2. GLOBAL DEVELOPMENTS

Global GDP grew solidly in 2018, but growth in various regions weakened and the expansion of world trade moderated.

Global GDP continued to grow solidly in 2018 (about 3.7 percent, similar to its 2017 growth rate), but the momentum slowed in the second half of the year, and the growth rate of world trade moderated. This moderation was attributed, inter alia, to the effect of the "trade war" and policies of retreat from globalization, particularly on the part of the US vis-à-vis China and its other trading partners.[20] The increasing uncertainty concerning restrictions of trade and their implications apparently contributed to the moderation of the growth rate of firms' investments in 2018. Due to the weakening of growth in various countries (particularly in the eurozone, Japan and the UK), the IMF lowered its global growth forecasts for the current year and the coming year (2018 and 2019) during the year, and again in January 2019.

The developments in 2018 varied between different regions of the world. The US economy continued its solid growth, reaching a full employment environment,

[19] See the discussion on gaps in skills in Chapter 5, and gaps in education in Chapter 6 (Section 7, which deals with the education budget) of this Report.

[20] For more discussion, see Chapter 7 of this Report.

with a low unemployment rate—inter alia due to expansionary fiscal policy. This will require reductions in the deficit and in government debt in the future, which may lead to a subsequent slowdown of growth. In contrast with the US, growth in some European countries slowed considerably in 2018. This was partly a result of uncertainty that encompassed the process of the UK's exit from the union (Brexit) and fiscal policy in Italy. The growth rate in China also slowed in 2018, partly due to the effect of the "trade war" with the US and the tightening of financial regulation on "shadow banking" activity. The emerging markets and developing economies were also affected by the tightening of financial conditions with the process of narrowing monetary accommodation in the advanced economies, and particularly the increase of US interest rates.

Monetary policy in most advanced economies remained accommodative, but a number of countries, led by the US, have already begun reducing the extent of accommodation.

The variance in the position of different countries along the business cycle was reflected in the variance of monetary policy between different regions. Monetary policy in most advanced economies remained accommodative, but a few of them have already begun to narrow the extent of accommodation, in particular raising their interest rates, for the first time since the Global Financial Crisis of 2008, in view of the increase in inflation and the improvement in real economic activity. Prominent among those narrowing their monetary accommodation is the Federal Reserve, which began increasing interest rates at the end of 2015.[21] The Fed raised its rates four times during 2018, by 0.25 percentage points each time, reaching a range of 2.25–2.50 percent at the end of the year. In contrast, the European Central Bank left its interest rate (on deposits) at -0.4 percent, and even announced that it is not expected to raise the rate before the summer of 2019. It did, however, narrow the extent of monetary accommodation by reducing its purchases of long-term bonds, and halted its net purchases at the end of the year.

The capital markets in the advanced economies were turbulent in the fourth quarter of 2018.

The capital markets in the advanced economies were turbulent in the fourth quarter of 2018. Equity prices declined sharply, and credit spreads on corporate bonds increased. Oil prices also declined sharply, following a significant increase in the three previous years. The fluctuation in the markets was also reflected in the Israeli capital market, where equity prices declined sharply and bond spreads increased. The market declines came against the background of concerns regarding a slowdown in global growth and uncertainty regarding the trade wars and their impacts, alongside concern over the effect of the monetary contraction by the Fed. The tightening of financial conditions on its own may have a negative impact on growth. However, at the beginning of 2019, there was increased optimism regarding trade agreements between the US and China, and regarding the expected pace of monetary contraction, particularly in the US. In view of this, the financial markets recovered and equity indices increased. It should be emphasized that at the time of this writing, the uncertainty regarding the trade agreements between the US and China has not yet dissipated.

[21] For a discussion of monetary policy in the US, see Section 3.

Table 1.2
Economic indicators: International comparison[a], 2010–18

	2010–16 average				2017				2018			
	Israel	US	Eurozone	OECD	Israel	US	Eurozone	OECD	Israel	US	Eurozone	OECD
GDP growth rate	4.0	2.3	0.5	2.1	3.5	2.2	2.5	2.5	3.3	2.7	1.9	2.4
Per capita GDP growth	1.7	1.4	0.9	1.5	1.5	1.5	2.1	2.0	1.3	2.2	-	1.8
Per capita GDP ($ thousand, current prices)	34.9	53.2	39.0	37.5	40.5	59.8	43.7	38.2	41.5	62.5	-	-
Population growth rate	1.9	0.8	0.4	0.6	2.0	0.7	0.3	0.6	2.0	1.1	0.3	0.6
Civilian labor force participation rate, ages 25–64	78.8	77.3	-	76.6	80.0	77.4	-	77.7	80.3	-	-	-
Unemployment rate	6.4	7.2	10.9	7.5	4.2	4.4	9.1	5.8	4.0	3.8	8.3	5.3
Inflation rate (during the year)	1.2	1.6	1.3	-	0.2	2.1	1.5	2.2	0.8	2.5	1.8	2.6
Exports (percent of GDP)[b]	30.3	13.0	-	28.2	27.3	12.1	-	29.4	28.1	-	-	-
Gross investment (percent of GDP)[c]	20.1	20.1	20.4	-	20.8	20.6	20.8	22.3	21.2	21.1	21.3	22.9
National savings (percent of GDP)[c]	23.4	18.4	22.8	-	23.7	18.9	24.7	24.2	24.2	18.8	24.9	24.5
Current account (percent of GDP)	3.3	-2.4	1.7	-0.2	2.9	-2.3	3.2	0.4	3.0	-2.4	3.0	0.3
Public expenditure (percent of GDP)[d]	39.5	36.5	-	45.0	39.4	34.8	-	42.6	39.7	35.7	-	42.4
Tax revenue (percent of GDP)[e]	30.6	25.0	-	33.4	32.4	27.1	-	34.5	30.8	24.9	-	-
Gross public debt (percent of GDP)[f]	66.8	102.8	76.5	68.6	60.9	105.2	76.2	68.1	61.5	106.1	75.2	67.1

[a] Figures for the eurozone and OECD countries are weighted averages of the data for the countries in each group, as published in the OECD Economic Outlook.

[b] For Israel—exports excluding diamonds.

[c] OECD data for 2017 and 2018 are the arithmetic averages of data for the OECD countries published in the IMF's World Economic Outlook.

[d] In Israel: excluding the decrease in revenue due to the sale of State-owned land.

[e] Data for the eurozone and OECD countries are the simple averages of the data for the countries in each group. Data for the eurozone do not include Latvia, Malta or Cyprus.

[f] Data on public debt are according to the IMF definition, and taken from the IMF system. The data on OECD and eurozone countries are the arithmetic averages of all countries for which there are data.

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

3. ECONOMIC POLICY

a. Monetary Policy

The Bank of Israel left the interest rate at 0.1 percent for most of the year, raising it to 0.25 percent in November.

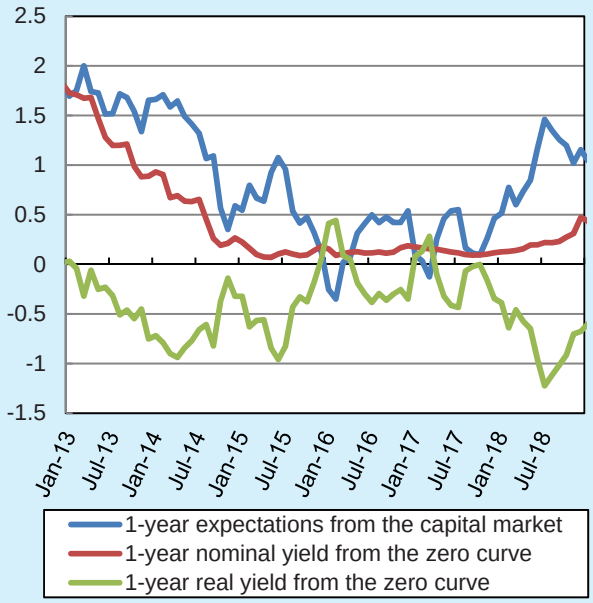
The main tool of the Bank of Israel's monetary policy, which is set by the Monetary Committee, is the short-term interest rate. Between March 2015 and November 2018, the Bank of Israel left the interest rate close to zero—at 0.1 percent—and in November 2018, it raised the rate to 0.25 percent.

For most of 2018, the Bank left the interest rate at its very low level in order to support an increase of inflation to within the target range and its entrenchment within the range, as well as to support employment and growth of economic activity in accordance with the economy's production capacity.

The accommodative monetary policy was reflected in a low real interest rate, which even declined during the year as inflation expectations increased.

The accommodative monetary policy was reflected in a low real interest rate. As Figure 1.6 shows, the one-year real interest rate was negative or near zero in recent years. Beginning in November 2017, one-year inflation expectations derived from the capital market increased steadily, reflected in a decline in the expected real interest rate. The increase in expectations during the first half of 2018 was reflected in an increase in the extent of monetary accommodation, as reflected in the real interest rate, even when the nominal interest rate remained stable.[22] The real one-year yield declined from about zero in October 2017 to -1.2 percent in July 2018, while one-year inflation expectations increased during the same period from about 0.1 percent to 1.5 percent (monthly averages). In the second half of the year, expectations decline

Figure 1.6
Nominal and Real Interest Rates, and Inflation Expectations, 2013 to 2018 (Percent)



SOURCE: Bank of Israel calculations.

[22] More precisely: The extent of accommodation depends on the difference between the real actual interest rate and the "natural interest rate", which is unobserved. Furthermore, agents' decisions are affected by longer-term yields. The real 5-year yield was quite stable during the first half of 2018—between -0.2 and -0.3 percent.

somewhat, offsetting some of their previous increase. Therefore, the real interest rate increased slightly, but remained very low, at about -0.7 percent (December average), below its average in 2016–17. As such, monetary policy remained accommodative.

Until the interest rate increase, the Monetary Committee left the forward guidance clause unchanged.

During the year, until the interest rate increase in the final decision of 2018, the Monetary Committee left its forward guidance clause unchanged, stating that, "The Monetary Committee intends to maintain the accommodative policy as long as necessary in order to entrench the inflation environment within the target range." This sentence, which remained unchanged since the interest rate decision for April 2017[23], was interpreted by market participants as stating that the Committee would increase the interest rate from 0.1 percent only when it assessed a high likelihood that the inflation environment was entrenched within the target range. In the period prior to the increase in the interest rate, the Committee prepared the public for the possibility of an interest rate increase in the near future, by publishing its assessment that inflation was close to being entrenched within the target range, among other things.[24],[25]

Forward guidance is a monetary policy tool that acts through its influence on the public's expectations. Expectations for a relatively low interest rate path in the future moderate long-term yields, allowing the central bank to increase the extent of monetary accommodation when the short-term interest rate is near zero.[26] The Bank of Israel's forward guidance clause indicated that policy would view the entrenchment of the inflation environment within the target range as a condition for starting to narrow the extent of monetary accommodation.[27]

In the months preceding the November 2018 decision, most Committee members were not convinced that the inflation environment was entrenched within the target range, particularly in view of two CPI readings that were lower than expected. The Committee therefore decided to leave the interest rate at 0.1 percent. When the interest rate was raised in November, the annual inflation rate was close to the lower

[23] This text replaced prior texts. See the Bank of Israel Annual Reports for 2016 and 2017.

[24] For instance, in the interest rate decision made at the end of August 2018, the Committee noted that "it appears that the inflation environment is moving toward entrenchment within the price stability target range," and the minutes of the Monetary Committee's discussions prior to the interest rate decision in October 2018 state that, "The Committee's assessment is that in any one of the coming interest rate decisions it will be possible to raise the interest rate in accordance with the data and the manner in which the Committee members analyze them."

[25] Nevertheless, the timing of the interest rate increase seemed to surprise the markets and most professional forecasters, which expected that the first increase of the interest rate would only be at the beginning of 2019. See Chapter 3.

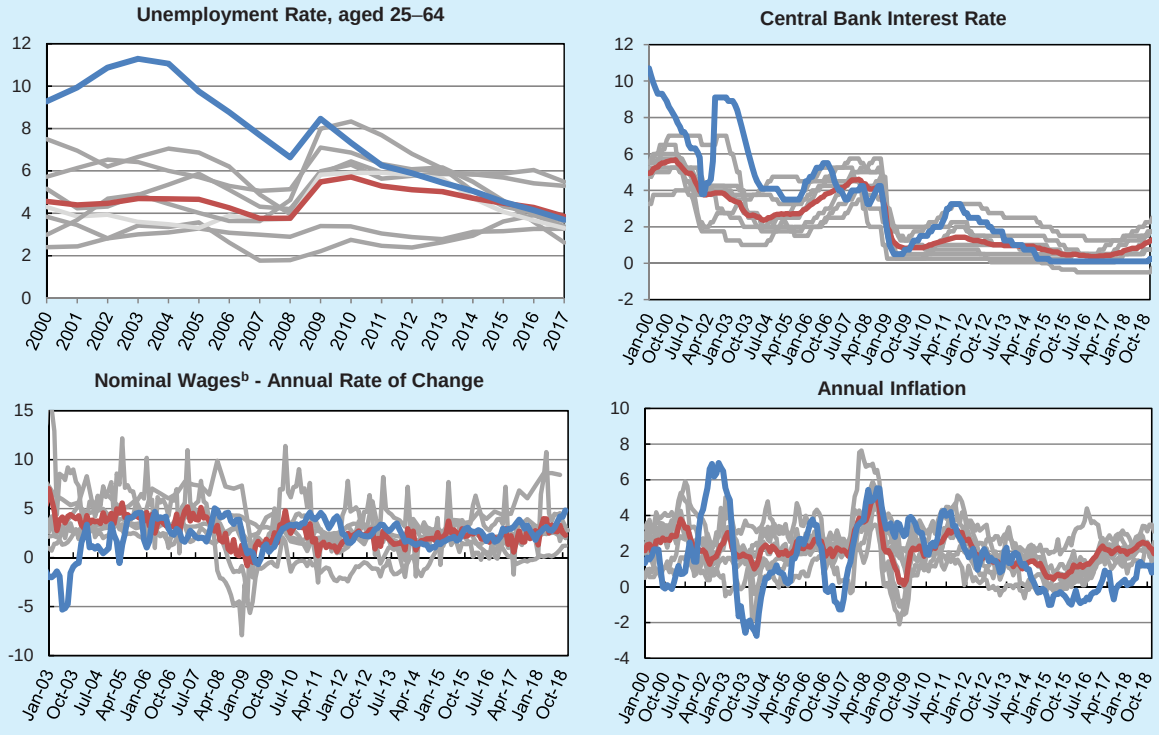
[26] The bank of Israel did not lower the interest rate below 0.1 percent, inter alia in view of the uncertainty concerning the ramifications of negative interest rates. See Chapter 3 of the Bank of Israel Annual Reports for previous years.

[27] A study conducted at the Bank of Israel examined the effect of the Bank's forward guidance on government bond yields. See: A. Kutai (2018), "Measuring the Effect of Forward Guidance in Small Open Economies: The Case of Israel", mimeo, Bank of Israel. In examining the effect of a change to the text of the forward guidance in April 2017 (to the text that remained in place in 2018 as well), there was no statistically significant change found to the yield curve on the date of the change in the text. This result hints that the change in the text did not change the public's assessments that were prevalent at the time regarding the expected path of the interest rate.

bound of the range (1.2 percent), and inflation of the CPI excluding energy and fruit and vegetables and net of government-initiated measures (an index that serves as an indication of "core inflation") was at the lower bound of the target range (1 percent). The Monetary Committee believed that the inflation environment had become entrenched within the target range—in other words, it was convinced that there was a high likelihood that it would remain within the target range. This was in accordance with the assessment that the increase in inflation reflected fundamental, rather than temporary, factors—particularly the tightness of the labor market, which was reflected in a prolonged increase in wages—as well as the weakening of other factors that had moderated inflation in previous periods, such as the strengthening trend of the shekel. Inflation expectations for the coming year, and for the following year, increased during the year, and stabilized within the target range—alongside expectations that the interest rate would be increased at the beginning of 2019. Expectations also therefore supported the assessment that a gradual increase in the interest rate was consistent with inflation remaining within the target range.

In November, the Monetary Committee's assessment was that the inflation environment was entrenched within the target range, and it therefore increased the interest rate to 0.25 percent.

Figure 1.7
Various Indicators in Advanced Economies[a] that Increased their Interest Rates, 2000 to 2018 (Percent)



[a] The advanced economies that increased their interest rates since 2015 are: Israel, Canada, the US, the Czech Republic, Norway, Sweden, the UK and South Korea.
[b] The annual rate of change in Israel, South Korea, Sweden and the UK is based on the moving three-month average. The data for Canada are the annual change that appears in Bloomberg. The rest of the data are annual rates of change in quarterly data.
SOURCE: Based on Bloomberg and OECD.

The inflation rate at the time of the interest rate increase was more moderate than it was in other countries when they increased their interest rates.

Figure 1.7 examines the development of inflation, the interest rate, the unemployment rate, and wages in Israel and in other advanced economies that increased their interest rates (from low levels) since 2015. In Israel, the interest rate was increased after a long period of increasing inflation, alongside a sharp decline in the unemployment rate. At the time of the increase in the interest rate, inflation was still relatively moderate (around the lower bound of the target range)[28], but this was, as stated, alongside strong economic activity, which was reflected in a low unemployment rate and a relatively large increase in wages. It is interesting to note that the first increase in the interest rate in the US, in December 2015, was made when the annual inflation of the CPI (for the 12 months ending in November 2015) was just 0.5 percent, but the low inflation there was to a large extent a result of a sharp decline in oil prices, and the rate of increase of the CPI excluding energy and food (an American "core index") was 2.0 percent at the time.[29] Similar to the explanation that accompanied the first increase in the interest rate in Israel, the Fed explained the increase by citing the significant improvement in the labor market, leading to the Open Market Committee's assessment that inflation would return to a rate of 2 percent in the medium term. The Fed increased the interest rate a second time only a year after the first increase, and at the time of the second increase and those following, the annual inflation rates were higher—above 2 percent on average.

The increase in the interest rate was also due to the recognition that a very low interest rate for an extended period may have negative ramifications in the long term.

The Bank of Israel increased the interest rate—as stated—when the annual inflation rate was close to the lower bound of the target range, and the assessment that an increase in the interest rate would not impair the entrenchment of inflation within the target range was a condition of starting the process of raising the rate, as indicated by the forward guidance clause. It was also the Monetary Committee's assessment that real economic activity would remain strong even if monetary policy would be less accommodative. The motivation to increase the interest rate was also a result of the recognition that a very low interest rate for an extended period of time may have negative implications—including on financial stability and the allocation of sources of financing.[30] At the time the interest rate was raised, the risks from the standpoint of financial stability were to some extent more moderate than they had previously been. The housing market had started to cool, and the risk spreads on corporate bonds increased from the low levels that had previously been prevalent.[31] Even so, spreads remained historically low, and home prices remained high.

[28] The annual inflation rate at the time of the first increase in other countries was about 2 percent on average.

[29] In contrast, the interest rate in Israel was raised following a period of oil price increases, and the increase in the CPI excluding energy and fruit and vegetables and net of government-initiated measures was slightly less than the increase of the overall CPI.

[30] The negative implications that a very low interest rate over time may have in the long term were mentioned as a consideration for monetary policy in the published minutes of the Bank of Israel's monetary policy discussions.

[31] The low level of corporate bond spreads raised concern that it reflected an under-assessment of risk in some bonds. From this standpoint, increased spreads are consistent with a decline in the risks to stability.

Another tool used by the Monetary Committee since 2008 is intervention in the foreign exchange market. Since August 2009, the policy framework concerning foreign exchange purchases has been defined as intervention in the market "in the case of excessive volatility in the exchange rate that is not consistent with the fundamental economic conditions, or when the foreign exchange market is not functioning properly". Since 2013, the Bank of Israel has also purchased foreign exchange as part of a program to offset the effects of natural gas production in Israel on the exchange rate. In 2018, the Bank of Israel's purchases in the foreign exchange market were almost all as part of the "gas program".[32] As stated above, the trend of appreciation of the shekel in recent years was halted in 2018, which attested to the moderation of forces that had acted for appreciation in the past. Therefore, the Bank of Israel saw no need for broad action in the foreign exchange market. The Bank also announced that the gas program would be halted at the end of the year. These conditions in the foreign exchange market, under which the Bank was not required to intervene against the over-appreciation of the shekel, created a convenient environment for starting the process of raising the interest rate.

Beginning in February, the Bank of Israel's foreign exchange purchases were only as part of the program to offset the effects of natural gas production on the exchange rate. In November, the Bank announced that this program would end at the end of the year.

Box 1.1

Monetary policy in view of supply shocks

The relatively low inflation in recent years—particularly compared to other advanced economies—has been attributed in part to measures taken by the government to lower the cost of living and to increase competition, technological advances that have made it easier to compare prices and purchase various goods online, and changes in consumer awareness and behavior.[1] Consumers' sensitivity to price increases was reflected in the social protests that broke out in the summer of 2011, and in the years following, and it is likely that it has influenced companies' decisions in pricing their products. These factors can be referred to as "supply factors" that make it difficult on companies to raise prices. It is easier for consumers to substitute alternatives for the products companies sell (i.e., the elasticity of substitution increases), leading to a decline in companies' markup—the difference between the prices they charge and their marginal costs. This box refers to these factors as "increased competition" or a "decline in profit margins".[2]

[1] See the Bank of Israel Annual Reports for 2016 and 2017.

[2] Chapter 1 of the Bank of Israel Annual Report for 2016 showed a decline in profitability in sectors where competition increased, particularly in the area of clothing, footwear, and personal items, and in the area of computers and communications.

[32] In principle, purchases as part of the gas program can also serve to manage monetary policy, through the selection of the timing of the purchases over the course of the year in accordance with market conditions. However, in practice, the purchases as part of the gas program were for significantly lower amounts than the purchases for policy considerations (at least on the monthly level). See Figure 3.14 in Chapter 3.

The question is, if the source of below-target inflation is a decline in profit margins rather than low demand, how does this affect the desired response of monetary policy, if at all?

Optimal policy strives to maximize the well-being of individuals in the economy. The literature dealing with optimal monetary policy shows that in a basic theoretical (New-Keynesian) model, the well-being of individuals is at its highest when the level of economic activity is close to "efficient" and prices are stable. The efficient level of activity is one that is consistent with the level of activity that would prevail in the economy under conditions of perfect competition. In such a situation, the cost of an additional output unit (which reflects the loss of individuals' utility from additional labor at the expense of leisure) is equal to the utility derived by individuals from an additional output unit. When GDP is lower than this level, increasing it will increase well-being, because the cost associated with the additional production is lower than the utility individuals derive from it. The opposite is true when the level of GDP is too high. According to the New-Keynesian model, the reason why price stability contributes to well-being is that in the absence of perfect price elasticity (for various reasons), price changes by some firms lead to an inefficient allocation of production between firms, and the economy therefore produces less than what could be produced using the employed means of production. More generally, maintaining moderate inflation that is stable and predictable in the medium-to-long term reduces the uncertainty facing the various agents in the economy, thereby supporting economic activity.

Policy will therefore strive to bring the economy as close as possible to price stability and to the efficient GDP level.[3] In cases where it is possible to concurrently achieve these two objectives, monetary policy has no dilemma. For instance, in a case where the starting point of the economy is at long-term equilibrium, where the level of activity is optimal and prices are stable[4]—if there is a negative demand shock that acts to lower demand, resulting in a decline in inflation, policy can stabilize its two target variables. By lowering the interest rate, it will encourage activity so that GDP will return to its "natural" level—the level that is consistent with a situation where prices are flexible—and thereby prevent price declines. In this way, it will achieve both price stability and the desired level of activity.

In contrast, other shocks may create a dilemma for policy. Such shocks (called "cost-push shocks") cause inflation to deviate from the price stability target when GDP is at its efficient level. Therefore, policy cannot achieve both of its objectives simultaneously. An example of such a shock is a "markup" shock. Let's assume again that the starting point is efficient equilibrium, and there is a markup shock that causes firms to increase their margins. In such a case, prices will increase—creating inflation—and activity will decline because the price increase lowers demand. Policy is faced with a tradeoff between the two objectives. If it adopts a restrictive policy by increasing the interest rate in order to return inflation to the target, demand will decline and activity will diverge from its desired level. If it adopts an accommodative policy by lowering the interest rate in order to increase activity, inflation will be too high. In such a situation, the optimal policy will balance the two objectives, such that each will deviate slightly from its desired level: Activity will be a little too low, and inflation will be slightly higher than the target for a

[3] This theoretical result supports (at least in principle, even if practical implementation differs from the theoretical definitions) the setting of the main objectives for many central banks around the world, including those of the Bank of Israel as defined in the Bank of Israel Law—maintaining price stability and supporting economic activity.

[4] A case where we assume an "efficient steady state".

certain period. We can therefore say that supply shocks that increase inflation and lower GDP to below its optimal level justify a less "hawkish" policy than demand shocks, meaning policy that will not strive to rapidly return inflation to its target, in order to avoid a more negative impact to activity.[5]

But what about "increased competition" shocks that lower margins, and therefore prices? In such a case, we assume that prices are too high at the starting point due to monopolistic power (insufficient competition), and the level of activity is therefore lower than the optimal level.[6] From this starting point, a process where profit margins decline, leading to an increase in GDP, is desired, but the deviation of inflation from the price stability target (insofar as price adjustments are not immediate but take time) is not desired. In such a situation, at least at the starting point, policy has no dilemma. As long as GDP is lower than optimal and inflation is below the price stability target, an accommodative policy serves both objectives. It encourages demand, and thereby supports an increase in activity toward the desired level. The increase in demand for goods, and the resulting increase in demand for means of production, act to raise the costs of production, particularly wages. The increased cost acts to lower the spreads between price and marginal cost, thereby achieving a reduction in margins partly through increased wages and to a lesser extent through a prolonged decline in prices.

It is important to note that monetary policy is not intended to deal with long-term structural problems, including a noncompetitive market structure. If GDP at long-term equilibrium is too low (due to monopolistic power) alongside price stability, it may apparently motivate monetary policy to be accommodative in order to reinforce activity. Such motivation may lead to an "inflation bias".[7] However, a regime in which there is an independent central bank committed to an inflation target helps avoid such inflation bias. In contrast, in a process in which margins decline, as described above, where GDP is lower than potential and inflation is below the target, accommodative monetary policy supports both objectives—increasing activity toward the desired level, and converging inflation toward the target.

It is worth noting that the economic environment in which policy operates is not a result of one shock, but of a variety of shocks. The guiding principle is balancing the policy objectives—particularly the level of activity and price stability. As long as both inflation and activity are lower than desired, accommodative policy will, as stated, serve both objectives. In contrast, when inflation is low and GDP is too high (the cost of production is higher than the utility from an additional output unit), policy may be willing to accept inflation that is lower than the price stability target as a temporary situation, in order to converge GDP to its desired level.

Another policy objective (which is not analyzed in the basic New-Keynesian model) is support for financial stability. Here, "GDP that is too high" in the policy dilemma described above can be substituted with concern of the development of risks to financial stability that may have a negative impact on future

[5] Here, the credibility of the inflation target regime is important. The more established that credibility is, the more policy can enable inflation to temporarily deviate from the target in favor of the activity target, without it having a negative impact on achieving the inflation target in the medium-to-long term. Federal Reserve Chairman Jerome Powell discussed this, for instance, in his speech at the Jackson Hole conference in 2018 (see Powell, 2018).

[6] In the literature, such a case is called a "distorted steady state". A theoretical analysis of policy in such a case is presented in Benigno and Woodford (2005), and in Galí (2015).

[7] This result is obtained when we assume that policy cannot act with commitment to the future, and thus acts in each period with discretion. Kydland and Prescott (1977) and Barro and Gordon (1983) provided early analyses of the inflation bias idea. See also Galí (2015).

activity. Such considerations also may cause policy to be less accommodative and enable the slower convergence of inflation to the target.[8]

This box has focused on the objectives of price stability and economic activity, which are the main objectives of monetary policy within basic New-Keynesian models. More complex models include additional rigidities and distortions, and accordingly, additional channels and considerations that may influence the desired policy. These include: different types of goods, rigidities in the labor market, heterogeneity between various agents, considerations related to the exchange rate in an open economy, and, as stated, financial stability. This discussion has also ignored additional implications of increased competition, beyond the decline in profit margins, on the motivation to invest, on productivity, and more.

While this discussion dealt mainly with low inflation as a result of increased competition, there is evidence that margins in the advanced economies increased in the recent decades, particularly due to the development of large international firms ("superstars") and the large market power they gain.[9] Concern therefore prevails in those economies regarding a decline in competition and an increase in margins—in contrast with the process of increased competition discussed here. A structural process of declining competition presents policy with a dilemma between the desire to converge inflation to the target and the desire to support activity.[10]

REFERENCES

Barro, R. J., and D. B. Gordon (1983). "A Positive Theory of Monetary Policy in a Natural Rate Model", *Journal of Political Economy*, 91(4): 589–610.

Benigno, P., and M. Woodford (2005). "Inflation Stabilization and Welfare: The Case of a Distorted Steady State", *Journal of the European Economic Association*, 3(6): 1185–1236.

Borio, C. (2016). "Towards a Financial Stability-Oriented Monetary Policy Framework?", Presentation at "Central Banking in Times of Change," conference on the occasion of the 200th anniversary of the Central Bank of the Republic of Austria, Vienna (pp. 13–14).

De Loecker, J. and J. Eeckhout (2017). "The Rise of Market Power and the Macroeconomic Implications", National Bureau of Economic Research (No. w23687).

De Loecker, J. and F. Warzynski (2012). "Markups and Firm-Level Export Status", *American Economic Review*, 102(6): 2437–2471.

Díez, M. F., M. D. Leigh, and S. Tambunlertchai (2018). "Global Market Power and its Macroeconomic Implications", International Monetary Fund.

Galí, J. (2015). *Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework and its Applications*, Princeton University Press (Ch. 5).

[8] Support for financial stability is achieved mainly through prudential tools, particularly regulation. There is no consensus in the literature (or in central bank practice), regarding the desired place of financial stability considerations in the conduct of monetary policy. See, for instance, Svensson (2017), versus Borio (2016).

[9] See, for instance, Box 1.1 in the October 2018 World Economic Ooutlook and the work of Díez, Leigh and Tambunlertchai (2018), De Loecker and Warzynski (2012), and De Loecker and Eeckhout (2017). Díez et al found evidence of an upward trend in margins in recent decades in Israel as well, similar to other advanced economies.

[10] See the discussion of monetary policy in view of an increase in profit margins in Van Reenen (2018), and the speech by Haldane (2018).

Haldane, A. G. (2018). "Market Power and Monetary Policy", Speech given at the Federal Reserve Bank of Kansas City Economic Policy Symposium, Jackson Hole, Wyoming, 24 August.

International Monetary Fund (2018). *World Economic Outlook*, Washington, DC, October.

Kydland, F. E. and E. C. Prescott (1977). "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, 85(3): 473–491.

Powell, J. H. (2018). "Monetary Policy in a Changing Economy", Speech given at "Changing Market Structure and Implications for Monetary Policy," a symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming.

Svensson, L. E. (2017). "Cost-Benefit Analysis of Leaning Against the Wind", *Journal of Monetary Economics*, 90: 193–213.

Van Reenen, J. (2018). "Increasing Differences between Firms: Market Power and the Macroeconomy", CEP Discussion Papers (CEPDP1576). Centre for Economic Performance, London School of Economics and Political Science, London, UK.

b. Fiscal policy

The government adopted an expansionary policy, which was reflected in increased civilian expenditure and a lowering of tax rates.

Alongside the continuation of very accommodative monetary policy, fiscal policy was also expansionary in 2018. The outgoing government adopted an expansionary policy during its term, which was reflected in an increase of public expenditure—particularly civilian expenditure—as a share of GDP, alongside a reduction in tax rates. The increased expenditure contributed notably to providing for social needs, which have been receiving only a limited response in Israel due to the low level of civilian public expenditure in recent years, and enabled an improvement of some public services, the budgets of which had been reduced in the previous decade. However, financing the expansion of services mainly by increasing the structural deficit may make it difficult to maintain the additions that were provided, and will certainly make it harder to expand those services in line with the multiyear plan approved by the government. This difficulty was evident this year, after the expansionary policy was not reflected in an increase of the actual deficit in 2016 and 2017 due to exceptional one-off revenues. In 2018, in the absence of such revenues, the actual deficit increased markedly, and it has continued to grow in the first months of 2019. The deficit in the government budget increased in 2018 to 2.9 percent of GDP, the revised ceiling set for this year and significantly higher than the 2 percent ceiling set as part of the Deficit Reduction Law when the government began its term in 2015. The deficit of the general government increased to 3.8 percent—the highest level since the institution of the deficit adjustment program in 2013.[33]

The deficit in the government budget increased markedly.

The increase in the deficit when the economy is close to full employment and the growth rate is close to potential was reflected in a significant increase in the cyclically

[33] For an explanation of the various deficit indices, see Chapter 6 of this Report.

adjusted deficit—to 4.2 percent of GDP in 2018. In the past three years, the structural deficit and the cyclically adjusted deficit increased markedly.

The increase in the deficit led to a halt in the trend of the past few years of lowering the public debt to GDP ratio.

The increase in the deficit led this year to a halt in the trend of the past few years of lowering the public debt to GDP ratio. According to Ministry of Finance assessments (in January 2019), the deficit in the government budget is expected to continue increasing in 2019, and to reach 3.6 percent of GDP (if no convergence measures are taken)—higher than the 2.9 percent ceiling set for the year. Over time, deficits of this scale are expected to increase the debt to GDP ratio, whereas the lowering of that ratio until 2018 contributed to an increase in Israel's credit rating and to lower interest expenses on the country's external debt.[34] Increasing the debt in years of full employment and growth in accordance with the potential rate will make it difficult for the government to encourage economic activity during periods of economic slowdown.

Maintaining the deficit ceiling will require fiscal adjustments—moderating the increase of expenditures and/or raising tax rates.

Maintaining the deficit ceiling will apparently require fiscal adjustments, including the moderation of the increase in expenditure—inter alia by significantly streamlining various expenditure items—and/or increasing tax rates, including by reducing exemptions. The Ministry of Finance forecasts of expected expenditures in the coming years, as presented in the updated three-year budget plan for 2020–2022 ("the Numerator"), and other welfare plans—announced but not yet formally budgeted, so they are not included in the analysis of the Numerator—reflect high rates of increase in public expenditure, beyond the expenditure ceiling derived from the expenditure rule.[35] It therefore seems that convergence to the deficit ceiling set by the law by moderating the increase in expenditure will present a challenge for the government, particularly in view of the broad programs to improve infrastructure, which have also not yet been budgeted.

In terms of the composition of government expenditure, which reflects the government's priorities, between 2016 and 2018, the government increased the relative portions of expenditures on economic services and general public services, mainly investment in infrastructure, transportation and housing.[36] Additional expenditure on social and long-term care insurance, education, healthcare, culture and religion, public order, and environmental quality were in line with the weights of these components in 2015, and the addition to defense expenditure was smaller than its share of the budget. (See Figure 6.4 in Chapter 6.)

[34] A box on the effect of raising Israel's credit rating appears in the Financial Stability Report for the second half of 2018.

[35] This is in view of the civilian expenditure as a share of GDP, which is low by international comparison. See Figure 6.1 in Chapter 6.

[36] The local authorities were largely responsible for the increase in investments, similar to the trend in previous local authority election years.

4. LONG-TERM ECONOMIC GROWTH AND INSIGHTS REGARDING SOCIOECONOMIC POLICY[37]

Background

Since the beginning of the decade, the GDP growth rate in Israel has declined by about 0.8 percentage points relative to the previous decade. As we have previously shown[38], this trend reflects fundamental forces, and it raises the questions of whether and to what extent those forces are expected to have a long-term impact on the economy. Why is such a precise assessment of expected economic growth[39] and the factors that influence it so important? First, the assessment is necessary in order to plan fiscal policy, such as tax revenue, and the National Insurance framework. Second, it is required in order to plan structural reforms and government initiatives in the areas of infrastructure, housing, education, healthcare, and manpower training, and to examine how these can be used to improve economic performance over time relative to a baseline scenario. Finally, the forecast may serve as a reference point to examine whether the present growth rate is consistent with the economy's long-term growth rate, and whether monetary or fiscal policy to support short-term growth is required.

In order to answer these questions, the Bank of Israel Research Department has developed a model for forecasting long-term growth in Israel, which makes it possible to assess how it will be affected by developments in background conditions, and by policy measures. The forecast is based on an important assumption—that economic policy makers will act to implement structural reforms at least to the extent that they have in the past. It is also based on the assumption that there will not be outsized external events such as a large wave of immigration or a natural disaster.

[37] Based on two discussion papers by Eyal Argov and Shay Tsur:

Eyal Argov and Shay Tsur (2019). "A Long Run Growth Model for Israel", Bank of Israel Research Department, Discussion Paper.

Shay Tsur and Eyal Argov (2019). "Conditional Convergence and Future TFP Growth", Bank of Israel Research Department, Discussion Paper.

[38] See, for instance, pages 28–29 of Chapter 1 of the Bank of Israel *Annual Report* for 2011.

[39] "Economic growth" relates to a continued increase in the quantity of per capita goods and services produced by a country, and it reflects an increase in the material standard of living.

The Bank of Israel Research Department has developed a model for forecasting long-term growth in Israel, which makes it possible to assess how it will be affected by developments in background conditions, and by policy measures.

The growth model

The model divides the forecast horizon into periods, and forecasts GDP in five year increments (2020, 2025, …, 2065). It is comprised of three main building blocks, each of which separately forecasts the development of means of production: (1) physical capital (machinery, equipment, vehicles, structures, and intangible assets that are part of the production process); (2) human capital (the contribution of workers and of their education); and (3) total productivity (the other factors contributing to growth, such as technology, and the background conditions through which the economy functions, such as infrastructure, the regulatory system, and the openness to trade). The model brings these building blocks together into a single forecast through the "production function", which defines the links between the means of production and how they are translated into the economy's output.

Each of the building blocks uses different methods. The main building block forecasts the development of the contribution of human capital by dividing the population into 84 groups—by gender, age (in five-year increments), and sector (non-ultra-Orthodox Jews, ultra-Orthodox Jews, and Arabs). We base the development of each group on a demographic forecast prepared by the Central Bureau of Statistics.[1] We then calculated the quantity of labor forecast for each group using assumptions about its relevant characteristics—participation rate, unemployment rate, and average number of work hours. In the next stage we add to the estimated quantity of labor by estimating each group's contribution to production, using assumptions regarding the average amount of schooling and experience in each group. Finally, we sum the human capital of all 84 groups to reach the effective human capital of the economy.

The second building block forecasts the development of physical capital. This development is determined first and foremost through capital accumulation, a process in which obsolete capital stock is replaced by investment such as the purchase of new machinery or computers. The investment in the new period is equal to a certain percentage of what is produced in that period. In the model, this rate is similar to the rate in the preceding period, but it also takes into account the rate of investment that is typical in the economy given its average rate in the past and the demographic qualities of the individuals (life expectancy, birth rate, and the ratio of adults to workers in the prime working ages). In addition, the model makes it possible to examine how various changes in the economy's background conditions affect investment through the long-term

[1] S. Faran and A. Klinger (2018). "Israel Population Forecast, 2015–2065", Central Bureau of Statistics.

component of the equilibrium model that was developed by the Bank of Israel Research Department.[2]

The third building block forecasts overall productivity of the economy. Through a regression of cross-sectional data, we estimate GDP per worker in an equation where the explanatory variables are foundational variables such as geography and culture, and variables influenced by policy—such as the quality of human capital (results on international tests and inequality in the number of years of schooling), the level of infrastructure (quality of the roads and the extent of use of landline and mobile telephones), and the quality of institutions (the World Bank's "Doing Business" index and the index of economic freedom).[3] We then calculate the gap for each country between actual GDP per worker and the forecast figure based on the values of the explanatory variables in 2010 and the regression coefficients. This gap reflects the extent to which overall productivity in Israel has the potential to grow more rapidly than the global average. When the gap is positive, as in the baseline scenario in Israel, a small portion of the potential is added to each period until the entire gap is closed in the long term.

[2] E. Argov, A. Barnea, A. Binyamini, E. Borenstein, D. Elkayam, and I. Rozenshtrom (2012). "MOISE: A DSGE Model for the Israeli Economy", Bank of Israel Research Department, Discussion Paper 2012.06.

[3] More information about the various indices is found in Tsur and Argov (2019). That article also examines and confirms the robustness of the coefficients in the estimation using a panel estimation that includes the policy variables for which we have available data for a sufficiently long period.

The forecast

Table 1 presents the main points of the forecast. The economy's growth rate is expected to drop in the baseline scenario from an average of 3.3 percent between 2000 and 2016 to an average of 2.7 percent between 2017 and 2035, and to an average of 2.4 percent over the entire forecast. The main reason for this has to do with the composition of human capital. The decline in the growth rate of the population is expected on its own to reduce the growth rate of the prime working age population (25–64), leading to a decline in the growth rate of the volume of labor in the economy. There was an even greater decline in the growth rate of the population aged 25–64 in recent years, and it is expected to decline by an average of 0.5 percentage points all told over the range of the forecast, compared to the average between 2000 and 2015.[40]

In the baseline scenario, the economy's growth rate is expected to drop from an average of 3.3 percent between 2000 and 2016 to an average of 2.7 percent between 2017 and 2035. The main reason for this has to do with the composition of human capital.

[40] Individuals aged 25–64 by the year 2044 have already been born, so we can estimate the likelihood of this scenario with a great extent of certainty, excluding the potential effect of migration to and from Israel.

Table 1.3
Hi7torical growth and forecast: main components

	Historical		Forecast		Difference between historical and forceast
	1980-2015	2000-2015	2015-2035	2015-2065	Difference between 2000-2015 and 2015-2065
GDP	4.1	3.3	2.7	2.4	-0.9
Per capita GDP	1.8	1.4	0.9	0.7	-0.7
Population	2.2	1.9	1.8	1.7	-0.2
Working-age population	2.5	2	1.5	1.5	-0.5
Total human capital	3.5	2.8	1.8	1.8	
Total employed (including foreign workers)	2.9	2.5	1.6	1.6	-0.8
Hours per worker	0	-0.2	0	0	0.2
Physical capital	3.7	3	2.8	2.2	-0.8
Total productivity	0.45	0.45	0.45	0.45	0

SOURCE: Based on Central Bureau of Statistics and the Bank of Israel growth model.

The decline in the growth rate of workers' education (years of schooling) and of the labor force participation rate is expected to lower the growth rate of the human capital component by a further 0.5 percentage points. These two components contributed a lot to the growth rate in recent decades, but they will contribute less in the future, both because the increase in the participation rate of non-ultra-Orthodox Jewish women has been maximized, and due to two contradictory forces among ultra-Orthodox men and Arab women: In the baseline scenario we assume that these groups would continue to increase their participation rate and their years of school, but since these characteristics have low values in these groups—currently, and throughout the forecast horizon—an increase in their share of the population is expected to lower the level of these characteristics among the entire population. The growth rate of the human capital component is therefore expected to decline by one percentage point, and its contribution to growth is expected to decline by 0.55 percentage points.[41]

The contribution of physical capital is also expected to decline, mainly because the decline in the contribution of human capital lowers the growth rate of physical capital

[41] This takes into account the GDP labor share (about 0.55). We assumed that the GDP labor share declined from 0.55 at the starting point to 0.52 at the end of the forecast horizon, somewhat continuing the sharper downward trend observed since the beginning of the 1990s—from 0.68 to 0.55. While this trend has halted in the meantime, and the GDP labor share actually increased in the past three years, partly due to the effect of the full employment environment, it does not necessarily attest to a long-term trend, which is also affected by other fundamental factors. More discussion on the development of the GDP labor share appears in Chapter 5 of the Bank of Israel *Annual Report* for 2017.

(since investment is determined relative to GDP). The expected aging (the increase of the elderly share) of the population is expected to further reduce the rate of investment through its effect on the rate of savings. Physical capital is expected to decline by 0.8 percentage points between the 2000–2016 average and the 2015–2065 average, and is expected to lead to a decline in growth estimated at about 0.3 percentage points.

Finally, overall productivity in the forecast range is expected to contribute only slightly less than it did between 2000 and 2010 (the gap is less than 0.1 percentage point). This result was obtained based on three main results produced by the empirical analysis that was part of the work on the model. The first is that the baseline growth rate of overall global productivity is expected to be 0.4 percent, assuming that it is similar to the average rate between 1990 and 2010. Since that period included both years of rapid global growth and years of crisis (for instance 2008–2010), this is a balanced assumption. The overall productivity component involves the highest level of uncertainty, since there is no agreement regarding the expected pace of global technological improvements or their effect on labor productivity. Second, the level of actual productivity per worker in Israel is just slightly lower (about 8 percent) than the level forecast for the economy given its characteristics and given the quality of education, infrastructure, and institutions. Finally, the gap between productivity per worker and its forecast level is narrowed by about 1 percent every year. Therefore, overall productivity of the Israeli economy is expected to grow in the baseline forecast only slightly more rapidly than global productivity, to 0.44 percent.

The level of actual productivity per worker is just slightly lower than the level forecast for the economy given its characteristics and given the quality of education, infrastructure, and institutions.

Forecasting growth for periods of up to 50 years is a very ambitious task, and quantifying the uncertainty involved in such a forecast carries tremendous importance on its own, and because it may help its consumers in their decision-making. As detailed in the article describing the forecast model, the uncertainty involved in each of the components was quantified using a different method, and the analysis raised three main insights. The first is that when we take all of the components of uncertainty into account, the forecast ranges between 1.8 and 3 percent (compared with 2.4 percent in the baseline forecast). The second is that the uncertainty is not biased in a particular direction, since the baseline forecast is close to the median of the forecast range. The third insight is that the assumptions regarding the characteristics of the labor force make the largest contributions to the uncertainty. The following section discusses the question of how socioeconomic policy affects these characteristics and the overall productivity of the economy.

Socioeconomic policy and the growth forecast

Our forecast is based, among other things, on the assumption that future economic policy measures will at least make the same achievements as the policy adopted since the mid-1980s.

As mentioned, our forecast is based, among other things, on the assumption that future economic policy measures will at least make the same achievements as the policy adopted since the mid-1980s.[42] This is a considerable target. Since the establishment of the State, and even more so since the Economic Stability Plan of 1985, the Israeli government has taken many policy measures to deal with challenges in the economy—a high level of investment in roads, exposure to imports, processes to increase the labor force participation rate, educational reforms, and more. These measures apparently contributed to the growth rate of the economy. We now examine the possible contribution to economic growth of additional recommended measures, while discussing the main challenges facing the economy in the areas of employment, institutions, education, and infrastructure.

Employment: One of the main challenges facing the Israeli economy is the low participation rate of Arab women and ultra-Orthodox men relative to the rest of the population. Their participation rates very much depend on socioeconomic policy. For instance, Mazar and Reingewirtz (2018) found that reducing the child allowance at the beginning of the 2000s increased the labor supply of Arab women and ultra-Orthodox men to some extent. Employment rates in these groups remains lower than the rate among the rest of the population, and the employment rate of ultra-Orthodox men is very far from the target the government set in 2010.[43]

If the policy intended to integrate ultra-Orthodox men and Arab women in employment is weak, it could lead to a significant decline (about 6 percent) in the forecast level of per capita GDP. However, if policy manages to accelerate the increase in the employment rate beyond the existing increase, it could contribute a further 3 percent to per capita GDP at the end of the forecast period.

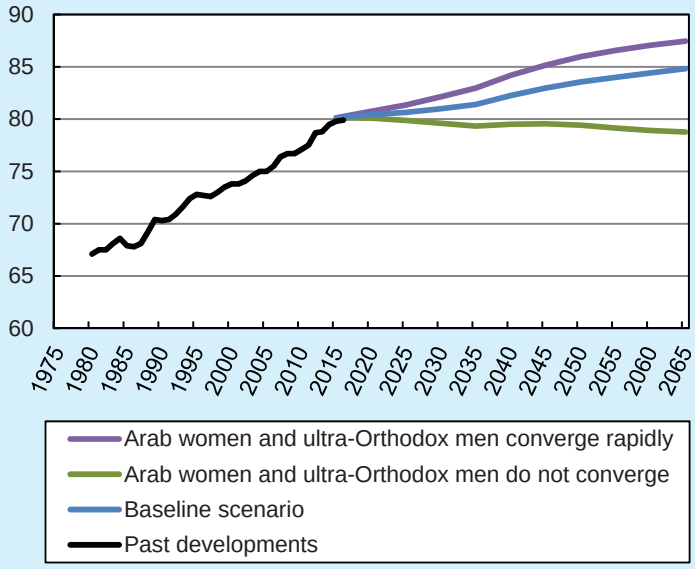
In the baseline forecast, we assumed that the government would implement employment measures that would result in an increase in the participation rates in these groups at a rate similar to the average in the past 20 years.[44] If a more pessimistic scenario plays out, for instance due to weakness in employment integration policy, the employment characteristics of these groups will remain unchanged. In such a case, the overall participation rate at the end of the forecast horizon will decline by 6 percentage points (Figure 1.8), and per capita GDP will be 6 percent lower. If a more optimistic scenario plays out, for instance due to an exceptional increase in active

[42] The assumption is reflected in the fact that we forecasted many components in the model on the basis of past trends. For instance, we forecasted that the characteristics of the labor force would increase at a much higher rate based on the past pace; investment as a share of GDP takes into account the average past investment rate; and the growth rate of overall productivity is influenced by past global trends.

[43] In 2010, the government set employment targets for 2020: 63 percent among ultra-Orthodox men and 41 percent among Arab women. In 2018, the rates were 47.1 percent among ultra-Orthodox men and 38.2 percent among Arab women.

[44] The characteristics of the various groups at the end of the forecast horizon will not necessarily be identical to the characteristics of the reference group—non-ultra-Orthodox Jewish men—and the extent of proximity to them depends on the birthrate characteristics of the various sectors and the rate of convergence to the characteristics of the reference group. In the model, we assumed that the birthrate characteristics affect the labor force characteristics in two ways. The first is that men and women have fewer years of schools as birthrates increase in the sector to which they belong in their childhood, assuming that as the number of children per family increases, the number of years of schooling in adulthood decreases, on average. The second is that women tend to participate less in the labor force and/or work fewer hours the more preschool-age children they have.

Figure 1.8
Labor Force Participation Rate Scenarios, 1975 to 2065
(Percent)



SOURCE: Based on Central Bureau of Statistics and the Bank of Israel's growth model.

labor market policy and/or due to changes in the ultra-Orthodox and Arab education systems, the employment characteristics of Arab women and of ultra-Orthodox men who are just starting out in the labor market will match the participation rates of non-ultra-Orthodox Jewish men at the end of the forecast period. In such a case, the participation rate of the prime working age population will increase by another 3 percentage points relative to the baseline scenario, the stock of physical capital will increase accordingly, and per capita GDP will increase by an additional 3 percentage points.

In order to bring the economy close to the optimistic scenario, the government must act to successfully integrate all population groups in the labor market consistently—from the education system through to welfare and employment policy. In terms of the education system, ultra-Orthodox men have lower levels of basic cognitive skills (numeracy, literacy, and problem solving in a technology-rich environment) than non-ultra-Orthodox Jews, and the gap is particularly large regarding young ultra-Orthodox men. This may be a result of the fact that over the years, these subjects have been removed from the curricula of the ultra-Orthodox school systems, particularly among

boys.[45] Since the gap is a barrier to the integration of ultra-Orthodox men in the labor market, and it is difficult to overcome it at older ages, they must be encouraged to study areas of knowledge that are relevant to the labor market. The need for such a policy increases in view of the fact that ultra-Orthodox men are expected to grow as a proportion of the population from 3.6 percent in 2015 to 11.5 percent in 2065, and the ultra-Orthodox population is expected to increase to about 25 percent of the prime working age population by 2065. It is also important to expand access to academic education that is relevant to the labor market for all population groups, including the ultra-Orthodox and the Arabs.

In addition to actions in the education system, policy must consistently support employment among individuals with low earning capability, and minimize the use of benefits that lower the incentive to work. While the government operates many programs to expand participation in the labor market, most of them are budgeted with only a few million shekels, and encompass dozens to a few thousand participants per year. The Israeli government spends relatively little on active labor market policy (0.2 percent of GDP, while the average expenditure in the OECD is 0.6 percent of GDP). It is recommended to increase this budget in order to achieve two objectives. The first is to expand the integration of population groups that participate little in the labor market, including Arab women and ultra-Orthodox men. The second is to support the acquisition of basic cognitive skills and professional training throughout life.

Similar to the analysis of the ramifications of changes in the employment characteristics on the growth rate, the model makes it possible to analyze the effects of changes in the areas of education, infrastructure and institutions on growth. These have a large effect on the level of productivity in the economy, and are very sensitive to government policy. We found that if a change of the same scale (in terms of standard deviation) is made in each of these areas, we will obtain the largest effect in the area of infrastructure, and a smaller effect in the areas of education and institutions. However, since the largest gap to Israel's detriment compared with what is common in many advanced countries is to be found in the fields of education and institutions, achieving a given improvement in those areas may require a lower cost, which would make the return on investment in those areas greater. Here we present what various measures in these areas can contribute, and how growth can increase due to the maximum improvement in each area. "Maximum improvement" relates to the indices in the field reaching the average in the 95th percentile of the distribution of indices in the sample countries.

Institutions: Israel is ranked 30th among the 34 OECD member countries in terms of ease of doing business (the World Bank's Doing Business index). The model shows that if there is a maximum improvement in this area, GDP growth

[45] More information and detailed data appear in Bank of Israel (2016). "Survey of Adult Skills: General Background", Fiscal Survey and Selected Research Analyses, https://www.boi.org.il/en/NewsAndPublications/
RegularPublications/Research%20Department%20Publications/RecentEconomicDevelopments/red141e.pdf

will increase by close to 0.12 percentage points, such that the per capita GDP level will be 6 percent higher. Israel is ranked particularly low in three subindices: the ease of registering assets (30), the simplicity of paying taxes (32), and the extent of contract enforcement (28). Efficiency in registering assets and paying taxes, as well as similar bureaucratic processes, requires manpower of appropriate quantity and quality, advanced technology, and simplification of the relevant laws and regulations. In order to achieve this, it is recommended to act, as part of formulating public sector wage agreements, to set qualitative and quantitative goals for government ministry work, and to create maximum flexibility in adopting technologies. In terms of the text of contract enforcement, a focused empirical examination found that improvement in this area is particularly important for achieving improvement in the level of worker productivity. This finding is consistent with research findings around the world, which emphasize the importance of enforcing economic laws and strictly enforcing intellectual property rights.[46] Steps were taken in the right direction in 2018, when the Haifa District Court established an Economic Affairs Division, and the number of judges in the Economic Affairs Division in Tel Aviv was increased. It is recommended to take additional actions in this direction. It is also recommended to act toward improving additional aspects of the business environment, such as improving regulation concerning competition in the goods market. In this context, it is important to expand the standards reform that is intended to lower the restrictions on competing imports.

It is recommended to act, as part of formulating public sector wage agreements, to set qualitative and quantitative goals for government ministry work, and to create maximum flexibility in adopting technologies.

Education: While Israel is ranked high in the OECD in terms of people with degrees, it is at the low end of the distribution in international tests for students and graduates. The Bank of Israel Annual Report for 2017 showed that the low achievement level is in line with the forecast according to the per student expenditure volume—which is also low compared to the expenditure volume in other countries (see also the discussion on the development of the education budget in Chapter 6). The report also showed that inequality in achievements in Israel is particularly high, both due to inequality between Arabic speakers and Hebrew speakers, and due to inequality within the Hebrew-speaking group.

If the per-student education budget in Israel is increased to the average level in the OECD, it would increase by about 1 percent of GDP. The model shows that such an investment is expected to benefit the economy if it is efficiently channeled and leads to a situation where achievements also reach the average level in the OECD. In such a case, the GDP growth rate in 2065 will exceed the baseline forecast by 3 percent of GDP. A maximum improvement in the quality of education will increase growth by 0.13 percent of GDP, which will increase the level of per capita GDP in 2065 by 6.5 percent compared to the baseline scenario. However, we must remember

[46] See, for instance, Daron Acemoglu, Simon Johnson, and James A. Robinson (2001). "The Colonial Origins of Comparative Development: An Empirical Investigation", *American Economic Review*, 91(5): 1369–1401.

that improvement in education does not happen rapidly, and time is required until it matures into a contribution to the cognitive skills of workers and to growth.[47]

In order to support the efficient acquisition of basic cognitive skills, a policy is required to improve education at young ages, particularly the ages of 0–3, since the educational environment at these ages has a critical effect on the ability to obtain knowledge and skills at a later age. For instance, Heckman and Masterov (2007)[48] examined preschool education programs around the world and showed that they affect success indices in adult life (employment and wages), and that the main beneficiaries are children from less well-off families. It is therefore recommended to increase access to daycare centers for children from weak socioeconomic backgrounds, and to improve the quality of their staffs—by increasing benchmark requirements, earlier training, and adjusting employment and wage conditions—knowing that their job is not just to supervise, but also to educate, the children. It is important to emphasize that the skills learned at this age are not necessarily theoretical, but are life skills that provide an important basis for the ability to learn and obtain skills throughout life.[49]

It is recommended to take actions to attract high-quality teachers to weaker schools in order to attain continued improvement in the quality of teachers and to lower the inequality in scholastic achievements.

Additional studies show that improvement in the quality of teachers is the most efficient way to improve scholastic achievements even at later ages, particularly regarding students from the lower levels of the achievement distribution.[50] Chapter 6 of this report shows that the quality of teachers improved until 2014, but has since then begun to decline. It is recommended to take actions to attract high-quality teachers to weaker schools in order to attain continued improvement in the quality of teachers and to lower the inequality in scholastic achievements. For that purpose, the remuneration of teachers—particularly in the initial stages—should be improved at those schools. If a process is adopted whereby the inequality in achievement is lowered to the average level in the OECD without harming the achievements of students in the upper quantiles of the distribution, it will bring the average scholastic achievement in Israel to the center of the OECD distribution. Such a process will require both additional resources and organizational and planning effort that will ensure that those resources are utilized efficiently, particularly when more of them are being diverted to parts of the system where current output is low. Despite the challenges, this is a necessary effort, the success of which can have a dramatic impact on economic growth.

Infrastructure: Public investment in Israel is similar to the OECD average, but it is insufficient to close the gap in infrastructure quality between Israel and more advanced countries, particularly in view of the fact that the Israeli population is growing faster. Examinations made by the Accountant General's Office showed that

[47] Chapter 5 of this Report further expands the discussion of the connection between cognitive skills, labor productivity, and wages.

[48] James J. Heckman and Dimitriy V. Masterov (2007). "The Productivity Argument for Investing in Young Children",*Applied Economic Perspectives and Policy*, 29(3): 446–493.

[49] For more discussion regarding soft skills required in our time and in the future, see, for instance, information on the World Economic Forum website at https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution

[50] Chapter 1 of the Bank of Israel *Annual Report* for 2017 surveys these studies and presents a cost-benefit analysis based on them.

infrastructure investments of another NIS 15 billion per year are required in order to maintain Israel's position in the international ranking, and that to bring it close to the upper portion of the ranking, a further NIS 15 billion per year is required. Our model shows that the maximum improvement in the infrastructure area will increase the level of GDP in Israel by 6 percent, and as of 2018, that translates to about NIS 80 billion. It is too early to precisely assess the benefit that would be derived from increased investment in specific infrastructure projects, and the cost depends on the nature of financing and the efficiency of execution. However, a simple cost-benefit comparison supports the inclination to increase investment in infrastructure in the coming years, and to examine the benefit of each project on an individual basis.

It is recommended to complete and implement plans to establish a mass transit system in Gush Dan. When there is convenient access to train services, use of those services increases even among individuals who own a vehicle.

The lag in quality of infrastructure is particularly prominent with regard to public transit in metropolitan areas. While the rate of those traveling to work by public transit in the large cities in Israel is similar to the average in large and medium cities in Europe, if we take into account the qualities of the cities (such as climate, the student share of the population, and socioeconomic characteristics of the residents), we find that the rate in the Tel Aviv district (including Petah Tikva and Rishon LeZion) is significantly lower than expected. In order to deal with this, the government is planning to invest in the construction of an underground railway that will join the light rail lines already being planned and built, to create a modern mass transit system in Gush Dan. It is recommended that these plans be completed and implemented. Suhoy and Sofer (2019) found that when there is convenient access to train services (both in residential proximity and in proximity to places of employment), use of those services increases even among high income individuals who own a vehicle.

However, the lag in the level of infrastructure is not confined to public transit. In the area of communications there is a lag in fast Internet infrastructure, and it is recommended that the regulatory barriers causing this be identified in order to increase the incentive for companies to improve service by improving the infrastructure. In the energy market, it is recommended to build a master plan that includes a detailed treatment of the electricity infrastructure—mainly the transmission network, since it already constitutes a barrier to expanded use of renewable energy. Finally it is recommended that decisions be made regarding natural gas infrastructure and the construction of an additional international airport.

* * *

The implementation of significant reforms is not a trivial matter, but the greater implementation will increase the chances of accelerating growth and significantly narrowing the gap in living standards between Israel and wealthier countries.

The existing gap in the standard of living between Israel and more advanced economies has remained stable since the early 1970s, even though many reforms have been enacted in the intervening years. The implementation of further reforms is not a trivial matter, but special effort is required, since a decline in the pace of implementation may have a negative impact on the growth rate. Assuming that the growth rate is maintained, the Israeli economy is expected to narrow the per capita output gap between it and the OECD average by about 5 percentage points (about 13 percent; Chapter 5 provides more discussion of this gap) over the forecast period, but the gap between it and the

average among similar economies (small and open) is expected to remain in place (about 30 percent).[51] Greater implementation of significant structural reforms will increase the chances of accelerated growth and a significant reduction in the gap in the standard of living between Israel and wealthier countries.

Table 1.4
Comparing scenarios for improving total productivity to the baseline forecast

	Baseline forecast	Total productivity alternatives from improvements in:			
		Institutions	Infrastructure	Education	All changes
	Average annual growth rates				
GDP	2.4	2.5	2.5	2.6	2.8
Per capita GDP	0.7	0.9	0.9	0.9	1.1
Physical capital	2.2	2.3	2.3	2.3	2.5
Total productivity	0.4	0.5	0.5	0.5	0.7
GDP (2065, percent standard deviation from the level in the baseline model)		5.9	6	6.5	19.4

SOURCE: Based on Central Bureau of Statistics and the Bank of Israel growth model.

[51] This is the gap compared to Finland, Denmark, Austria, Sweden, the Netherlands, and Belgium.