Chapter 1
The Economy and Economic Policy

- In 2015, GDP grew by 2.5 percent, a moderate rate similar to the average rate of the three previous years (net of the effect of the start of natural gas production). In the years following the Global Financial Crisis of 2008, fiscal policy, alongside the increase in investment in residential construction, contributed to increased domestic demand and substituted to some extent the demand for exports. However, in the past two to three years, these effects dissipated and growth gradually came to be based almost exclusively on private consumption that was supported by accommodative monetary policy.
- Inflation turned negative at the end of 2014, and the downward trend continued in 2015. The downward trend is common to most advanced economies, and mainly reflects the sharp decline in energy and commodity prices. Monetary policy remained accommodative in 2015, and the Monetary Committee reduced the interest rate to its lowest level ever—0.1 percent—and increased foreign exchange purchases. The Committee decided not to increase monetary expansion because the economy is at full employment and because it assessed that the low inflation rate is driven mainly by supply factors and price reductions initiated by the government, and because the interest rate is near zero and home prices continued to increase.
- Fiscal policy was conducted for most of the year without an approved budget. The government's structural deficit declined slightly in 2015, further to its decline in the previous two years. Tax revenues increased in 2015 as a result of an increase in real estate transactions, expanded private consumption, and an increase in wages in the economy.
- The labor market continued to show robustness in 2015, despite the moderate growth rate. The participation and employment rates increased, and the unemployment rate continued to decline. Vigorous demand in the labor market was reflected in an increase in the ratio of job vacancies to the number of unemployed.
- The real exchange rate remained stable on average during 2015. The low interest rate and foreign exchange purchases helped this, as well as the closure of the gap between the growth of per capita GDP in Israel and that of other OECD countries, a gap that previously created pressure for continued real appreciation of the shekel.
- Home prices continued to increase in 2015, with an increase in the volume of transactions and a significant increase in mortgages. The level of activity in the industry remained high, as building starts totaled about 48,000 residential units, and building completions totaled about 43,000 residential units. The government launched a new format of the "Buyer's Price" program in 2015, as a key component of its efforts to lower the cost of housing for young couples. However, since the program makes only a small contribution to the supply of dwellings, it is unclear how it will affect prices in the market as a whole.

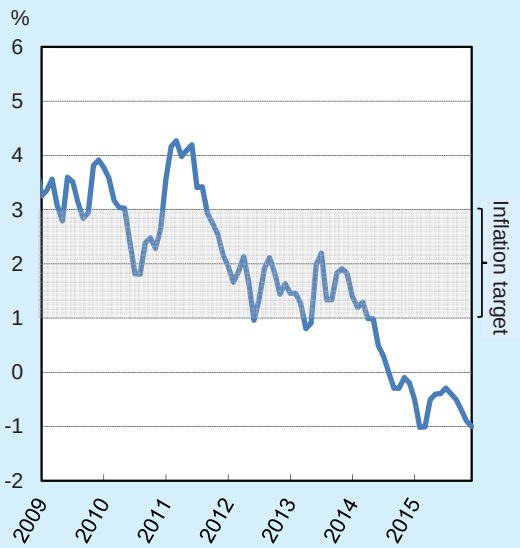
1. MAIN DEVELOPMENTS

This year, GDP grew by 2.5 percent, a moderate rate that was similar to the average rate of the three previous years.

In 2015, gross domestic product grew by 2.5 percent, a moderate rate that was similar to the average rate of the three previous years (net of the effect of the start of natural gas production). The slowdown in the economy is mainly the result of lower demand for exports, but while fiscal policy and the increase in investment in residential construction increased domestic demand in the 4–5 years following the Global Financial Crisis of 2008, these effects have dissipated in the past 2–3 years. Growth gradually came to be based almost exclusively on private consumption supported by accommodative monetary policy. The labor market continued to show robustness in 2015, despite the moderate growth rate. The participation and employment rates increased, and the unemployment rate continued to decline. The increase in the ratio between the number of job vacancies and the number of unemployed reflects a tight labor market. The economy therefore transitioned from growth based on the tradable sector to growth based on private consumption and on the nontradable—labor intensive—sector. The transition to growth based on a sector with low labor productivity is one of the reasons for the gap between the development of GDP and developments in the labor market—a moderate increase in labor productivity and in GDP compared to a stronger increase in the number of employed and in the real wage. This transition was made possible due to accommodative monetary policy and to an increase in the value of financial and real assets held by the public. In 2015, these were joined by the sharp decline in energy and other commodity prices, which contributed to an increase in real disposable income.

In parallel to the slowdown in the growth rate, the downward trend in inflation continued in 2015—a trend common to most advanced economies—after inflation became negative in September 2014 (Figure 1.1). This trend mainly reflects the sharp decline in energy and other commodity prices. In addition, government actions to lower the cost of living, as well as the nominal appreciation of the shekel and the decline in inflation expectations also contributed to low inflation in 2015.

Figure 1.1
Inflation in the Past 12 Months, 2009–15



SOURCE: Based on Central Bureau of Statistics.

The GDP components that reduced growth include exports and investments.

The GDP components that reduced growth include exports and investments (Table 1.1). Exports did not increase in 2015 despite some—slow—growth in world trade, indicating the possibility

Table 1.1
The contribution of GDP components to growth, 1997–2015[a]

	GDP	Private consumption	Public consumption	Investment in principle industries	Investment in residential construction	Export surplus[b] (excluding diamonds)
Share of GDP (percent, 2015 prices)	100	55	22	12	6	3
1997 – 2008	3.9	2.3	0.5	0.3	-0.1	0.5
	(3.9)	(4.3)	(2.0)	(2.0)	(-0.9)	
2009 – 2011	3.7	1.5	0.6	0.8	0.5	0.4
	(3.9)	(3.1)	(2.6)	(5.8)	(10.5)	
2014 – 2012	2.9[3]	1.8	0.8[c]	0.1	0.3	0.0[d]
	(2.9)	(3.3)	(3.7)	(0.4)	(4.6)	
2015	2.6	2.6	0.7	-0.4	0.1	-0.7
	(2.6)	(4.7)	(3.0)	(-3.3)	(2.4)	

[a] The contribution to growth in percentage points, yearly average. The number in brackets is the quantitative growth rate, yearly average. The total contribution does not equal the GDP growth rate due to the deletion of the contributions of investment in inventory. The contributions are based on an accounting calculation, and represent direct contribution only. By way of illustration, when export growth contributes to an increase in GDP through an increase in private consumption, the calculation separates it into the contribution of export surplus and the contribution of private consumption, and does not present it as a contribution of exports only.

[b] Quantitative exports (excluding diamonds) minus quantitative imports (excluding diamonds).

[c] This figure does not reflect the tax increase in 2013–14 made to redue the government's strucural deficit. The tax increase had a negative effect on private consumption, and appears in the table as part of the contribution of private consumption to growth.

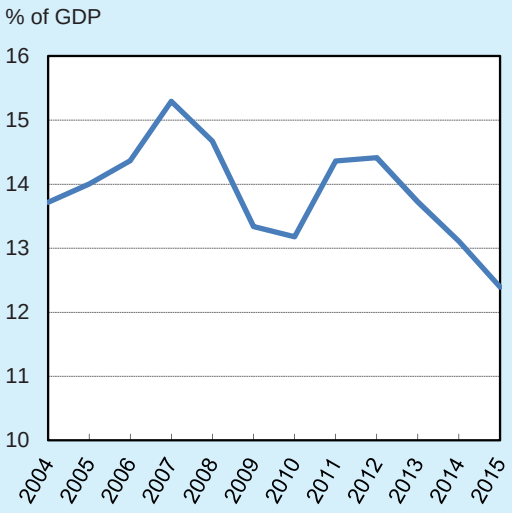
[d] Excluding the effect of the start of natural gas production, GDP growth in 2012–14 was about 0.4 percentage points lower per year on average, as was the contribution of the export surplus to growth.

SOURCE: Based on Central Bureau of Statistics data.

that domestic—and not just global—factors contributed to the weakness. The most notable change in export data is the slowdown in the growth of services exports—a component comprised partly of the export of information technology services. This slowdown followed a number of years in which the industry grew rapidly and pulled the entire export sector upward.[1] This suggests that the rapid growth in services exports may have reached its full potential, after many large international information technology companies have already opened research and development centers in Israel, and because there are supply limitations in the industry—as reflected in the wage level

[1] Volatility in services exports, as a result of volatility in the sale of startup companies, makes it difficult to identify the precise timing of the slowdown in services exports.

Figure 1.2
Investment in the Principal Industries, 2004–2015



SOURCE: Based on Central Bureau of Statistics.

in the industry (in foreign currency terms). Other export industries, including manufacturing exports and tourism services exports (due to the security situation), continued to stagnate in 2015.

The slowdown in investments is a result of a combination of growth in investment in the construction industry reaching its full potential and of the slowdown in investment in other industries. The slowdown in investment is significant in many advanced economies, and is a result of declines in capital utilization in recent years, and of expectations of slow growth in coming years. The rapid increase in investment in residential construction between 2008 and 2013, alongside investment in a number of large infrastructure projects, made it possible to maintain positive growth in fixed capital formation (excluding inventory) through 2014 (except for 2009). In the past two years, after investment in residential construction reached a high level and the investment in energy infrastructure was completed, the flow of investment in the economy has not grown, and as a percentage of GDP it has even declined. In these terms, the level of investment in the principal industries[2] was 1.5 percentage points lower in 2015 than the average between 2004 and 2013. Since the business sector did not encounter difficulty raising credit[3], it can be assessed that the weakness in investment is not a result of limited sources, but rather is a result of weakness in the demand for investment.

Private consumption grew rapidly in 2015, and remains the main contributor to growth.

Private consumption grew rapidly in 2015, and remains the main contributor to growth (Table 1.1). Private consumption excluding durables increased by close to 5 percent in 2015, an exceptionally high rate considering that GDP growth was stable in recent years. The exceptional increase may be mainly the result of the decline in energy and other commodity prices, and the result of the contribution of these declines to the increase in real disposable income. An additional contribution to the increase in consumption comes from the increase in the employment rate and in wages—

[2] Which does not include investment in residential construction.

[3] Bank credit to small and medium businesses continued to increase in 2015, and the Companies Survey indicates a decline in the share of small and medium companies reporting financing difficulties. While bank credit to large corporations declined, large corporations have a greater variety of potential sources (see Chapter 4).

particularly at low wage levels—as well as continued monetary accommodation, the decline in bond yields, and the increase in the value of financial and real assets held by the public, but these factors are not unique to 2015.

The increase in private consumption was supported by increased credit to the household sector, and particularly the rapid growth of consumer credit. The low interest rate encouraged the public to borrow, and even though most of it was directed to purchasing homes, the public also directed part of it to finance consumption. Consumption of durable goods was stable in 2015, but the reason for this is technical—due to changes in taxation on vehicle imports that were advanced to the end of 2014. Taking 2014 and 2015 together, consumption of durable goods increased by an average of about 5 percent per year.

The decline in energy and other commodity prices was a contributing factor in the growth of the economy and in lowering of prices. However, since the decline partly reflects the weakness of demand from abroad, some of its positive contribution only offset the negative effects of this weakness on the economy. According to Bank of Israel estimates, the improvement over the past two years in the terms of trade (an increase in the ratio of export prices to import prices) saved the economy about $5 billion per year. This saving benefited the business sector, through a decline in input prices; households, through lower prices of the basket of consumer goods and an increase in wages; and the government, through the macroeconomic effects of the decline in energy prices on tax revenues.

The decline in prices of energy and other commodities was a contributing factor to growth and to lowering of prices.

On the supply side, per capita growth in recent years was based mainly on an increase in the employment rate and in the stock of capital, while total productivity declined. The increase in the employment rate was made possible due to an increase in the participation rate and a decline in the unemployment rate. However, as the participation rate increases and the unemployment rate declines, the potential for growth based on an increase in the employment rate declines. In addition, a prolonged change in the age composition of the economy contributes to a slowdown in the increase of potential employees, meaning individuals in the prime working ages (25–64). Since the number of job vacancies increased in 2015, and unemployment continued to decline, it is possible that the decline in the potential increase in the number of employees also contributed to a moderation of growth.

The nominal wage per employee post increased by an average of 2.3 percent in 2015. An observation of its development over the course of the year (the fourth quarter of 2015 compared with the fourth quarter of 2014) indicates a higher increase—2.8 percent. Due to the low inflation environment, the real wage per employee post increased by a yearly average over yearly average of about 3 percent, and by 3.7 percent during the course of 2015, an increase consistent with the low unemployment level.

Real wages per employee post increased in 2015 by about 3 percent in terms of yearly average, and by 3.7 percent for the full year.

Some of the increase in wages is a result of the agreement between employers and the Histadrut (General Federation of Labor in Israel) to increase the minimum wage

In view of the developments of GDP, inflation and the global environment, monetary policy makers continued accommodative policy in 2015.

by 8 percent starting in April of 2015.[4] In retrospect, it can be said that the employers absorbed the increase in the real wage with relative ease. In particular, a gap of more than 3 percent opened between the GDP deflator and the Consumer Price Index in 2015. Employers indirectly relate to the GDP deflator, and the decline in input prices and in financing costs lowered to some extent the unit cost of labor, and contributed to an increase in their profitability. In contrast, employees relate to the Consumer Price index, and since that declined in 2015, they saw an increase in real wages.

In view of the developments of GDP, inflation and the global environment, monetary policy makers continued accommodative policy in 2015. At the end of February, after the Monetary Committee lowered the interest rate to 0.1 percent, the interest rate neared the "zero lower bound". Additional accommodation beyond what was already done would have required policy makers to use unconventional monetary tools, such as a reduction of the interest rate to zero or to negative levels and quantitative easing. However, the use of these tools entails risks, worldwide experience is not long enough to determine how beneficial they are, and the Monetary Committee's assessment was that the state of the economy did not warrant their use. Moreover, the Monetary Committee's assessment was that the negative inflation is temporary and is mostly the result of lower commodity prices and of price reductions initiated by the government. In addition, during the entire year, the Federal Reserve was expected to increase the interest rate in the US. For these reasons, the Monetary Committee decided not to use unconventional tools. Instead, it increased the use of intervention in the foreign exchange market to a certain extent. The Monetary Committee also used the forward guidance tool, announcing that the interest rate would remain low for a considerable time, and thereby signaling that it would not immediately increase the interest rate following a possible increase by the Federal Reserve.

Fiscal policy was conducted for most of the year without an approved budget. At first, this was due to the government's inability to pass a budget on time, and after the government was formed, there were relatively positive assessments of the state of the economy that contributed to the decision to delay passing the budget until November. At the end of the summer, when it became clear that government revenue was higher than forecast and growth was lower than forecast, the government decided to immediately reduce VAT and to reduce corporate tax from the beginning of 2016. The increase in government revenue during the year contributed to a reduction of the deficit to 2.1 percent of GDP.

[4] The employers and the Histadrut agreed to increase the minimum wage in three stages: in April 2015, in July 2016, and in January 2017. The agreement was expanded to the entire economy by law. A discussion of the changes in the minimum wage appears in the Bank of Israel Annual Report for 2014, Chapter 5.

2. ISSUES IN CURRENT DEVELOPMENTS

a. Low inflation and moderation in wage increases

The decline in commodity prices, particularly energy prices, led to a moderation of inflation in most of the advanced economies, and in some of them—including Israel—inflation became negative. In Israel, a number of administrative decisions also contributed to the decline in inflation, including the decisions to reduce VAT and to cancel the television levy. In addition, there are indications of increased competition in the retail market, which also contributed to a decline in prices. These are positive reasons for the decline in prices. The extent to which the public views low inflation as a reflection of a decline in future inflation has an impact on setting prices and wages. Since the interest rate is near-zero, such a dynamic makes it difficult for monetary policy makers to reduce the real interest rate with the aim of supporting activity and returning inflation to the target range.

It can be assumed that after two years (2012–2013) in which inflation ranged in the lower portion of the target range (between 1 percent and 2 percent) and two years (2014–2015) in which it ranged below the target range, the assessment of employers, workers (salaried and self-employed), and households is that there is a high likelihood of low inflation persisting in the economy in the coming year. The main indicator of this is the decline in inflation expectations. This decline occurred in parallel with the moderation of the increase in prices of many items in the Consumer Price Index in the past two years, and not just those directly related to energy prices or prices of imported goods. Table 1.2 shows the change in the prices of various nontradable aggregates in the CPI, and shows that the increase in the prices of some services moderated in the past two years. For instance, the price of health services (dental and medical services) increased by less than 1 percent per year in the past two years, as did the prices of various other services.[5] These moderate increases took place specifically in years in which real disposable income increased rapidly, and they may be explained by moderation in the inflation environment, as it is conceived by the public and by firms.

Another example that suggests that the public is internalizing the decline in the short-term inflation environment is the development of wages in the economy and the framework public sector wage agreement recently signed between the government and the Histadrut. Nominal wages per employee post increased by 2.3 percent in 2015, and by 2 percent on average in the past two years. While the increase in the past year is similar to the pace of increases in the past decade—2.5 percent—when taking into account that in the past two years the unemployment rate has been low and the growth of the participation rate has moderated, a more rapid increase of wages could have been expected. The relatively moderate nominal increase in wages is consistent with the assumption that the public assumes that inflation is currently lower than in the past

[5] The "various services" aggregate in Table 1.2 includes household assistance services, tutoring, lectures and professional development, and arranging parties and events, among other things.

Table 1.2
The development of the Consumer Price Index and of its nontradable components[a]

	Consumer Price Index, total	Nontradables index, excluding energy and food[b]	Housing	Various services[c]	Health	Education[d]	Communications	Meals away from home	Municipal taxes
Share of CPI (percentage, 2015)	100	53	25	10	4	4	3	3	2
2003–2013	2.1	2.1	2.4	1.8	3.0	1.7	-0.6	3.1	1.9
2009–2011	2.9	3.7	5.2	1.3	3.7	2.5	2.6	3.1	2.3
2012–2013	1.7	2.0	3.1	1.8	3.0	0.3	-6.8	2.6	2.6
2014	-0.2	1.8	3.1	0.9	0.8	2.1	-5.4	1.5	1.7
2015	-1.0	1.1	2.2	0.7	0.7	2.5	-6.8	1.3	5.0

[a] Annual rate of change, percent. The aggregates were calculated according to the 2015 weights. The rate of increase may therefore be slightly different than the official measurement.

[b] The nontradable products price index according to a distribution made by the Bank of Israel, excluding electricity, gas, water, food, and vegetables and fruit, and including meals away from home.

[c] The main items included are: household help; maintenance and home improvement; tutoring, lectures and professional advancement; catering parties and other events; recreation, holidays and trips; performances and concerts; legal and other services; fees; and so forth.

[d] Including kindergarten, elementary, seccondary, professional, and higher education.

SOURCE: Based on Central Bureau of Statistics data.

and a nominal increase of 2.3 percent in wages seems more significant in 2015 than a similar increase would have in the past.[6] However, the relatively slow increase in productivity does not support a rapid increase in wages in the economy as well.

Agreement to slow the pace of increase of nominal wages can also be identified in the framework agreements signed in the public services. While the collective agreements set an average increase of about 2 percent per year between 2010 and 2013 (in addition to the salary crawl associated with tenure or industry-specific agreements), the government and the Histadrut agreed to "skip" the wage increase in 2014, and made do with an increase of just 1 percent in 2015.[7] The new framework agreement delays the increase for 2016 to July, and this also amounts to just 1 percent. The increase for 2017 will only be given in March, and will be 1.75 percent, and the increase given in January 2018 for that year will be 1.5 percent—again lower than the

[6] The average data on wages per employee post do not describe the increase in wages in a position with specific characteristics, and are affected by workers joining or leaving the labor force, as well as by the volume of part-time employees. They may therefore be biased.

[7] The wage increase given to employees in 2015 was basically pushed off from the previous year. In June 2013, the government and the Histadrut agreed to delay the 1 percent wage increase that was supposed to have been given in July 2013 to January 2015. According to the logic behind an annual salary increase in a collective agreement, workers are owed an additional increase for 2015. The new collective agreement sets out that this addition will be given to workers as a one-off payment in two stages, and will not be included in the salary base.

2 percent received until recently. Toward the end of the new framework agreement, in June 2018, workers are expected to receive an additional 1.75 percent, thereby receiving compensation for the slowdown in the price increase up to that year. The agreement therefore enables a wage increase of roughly 7.5 percent over four years, leading to the conclusion that under the influence of the current low inflation, public service employees assume that apparently inflation during the period of the agreement will remain below the midpoint of the inflation target range. As such, the public service wage agreement, and to the extent that it affects wage agreements in the private sector, supports a return of inflation to the lower bound of the inflation target.

Expectations derived from the capital market for terms longer than two years show that the public's assessment is that inflation will gradually return to the midpoint of the target range. It is common to view five-year, five-year forward inflation expectations as an indicator of the credibility of the inflation targeting monetary regime. These expectations in Israel are anchored around the midpoint of the target range, at 2 percent. International experience shows that, in contrast with the past, commodity prices, and particularly oil prices, have a marked effect on inflation expectations, and that inflation expectations react relatively strongly to them. External shocks may, therefore, act to return inflation to within the target range and reverse the trend reflected in current short-term expectations.

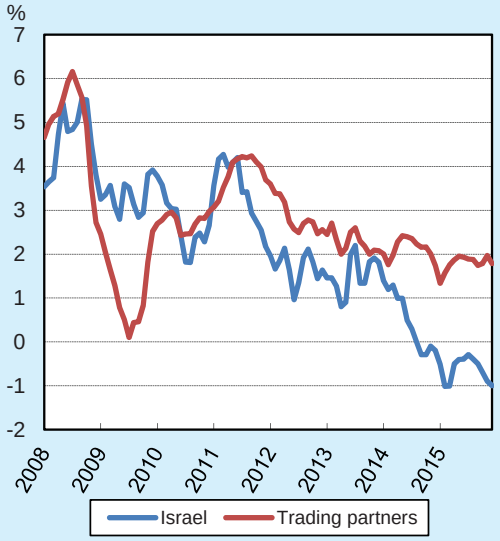
b. Negative inflation and the real exchange rate

The Consumer Price Index declined by 1.0 percent during the year, after declining by 0.2 percent in 2014. The moderation of inflation and its decline to negative levels are not only the result of a decline in the prices of imported inputs and end products, but are also the result of domestic factors, as hinted to by the fact that the CPI declined in Israel more than in other advanced economies or in Israel's major trading partners in 2015. In the past two years, the CPI has declined by a cumulative 1.2 percent, while in the other advanced economies, the median change in the CPI was 0.4 percent and the average change was 1.4 percent—both positive values.[8] In other words, in the past two years, the cumulative difference between inflation in Israel and inflation in the other advanced economies ranged between 1.6 percent and 2.6 percent. The difference between inflation in Israel and the weighted inflation of Israel's trading partners[9] during the same period is greater—close to 5 percent (Figure 1.3 and 1.4). Some of the difference is a result of price decreases initiated by the government in Israel. (For instance, VAT was not reduced in any country in the OECD during the past year.) This difference is mainly the result of large depreciations that led to an increase

[8] The question of whether we are interested in the median or the average depends on the objective. If we ask whether the situation in Israel is similar to the situation abroad, the median figure is of greater interest. If we are discussing the link between inflation, the nominal exchange rate and the real exchange rate, the average figure is of greater interest. Inflation in Turkey ranged around 8 percent, and in Chile it was around 4 percent. Therefore, the average in the OECD countries is higher than the median.

[9] Inflation weighted according to the trade weights.

Figure 1.3
Inflation in the Past 12 Months, Israel and its Main Trading Partners[a], 2008–2015



[a] The weighted average of inflation among the trading partners. The calculation is based on the weight of the currencies in the nominal effective exchange rate.
SOURCE: Based on Central Bureau of Statistics.

Figure 1.4
Inflation in the Past 12 Months, Israel and the OECD Median, 2008–2015

[a] Relates to the years 2014 and 2015.
SOURCE: Based on Central Bureau of Statistics.

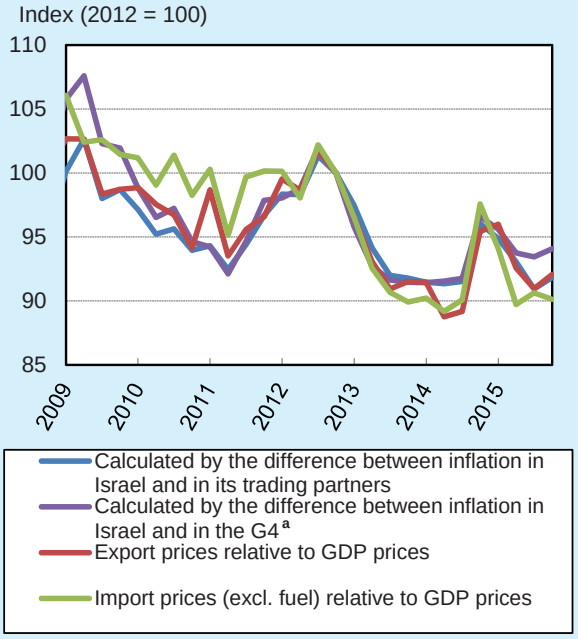
in inflation in some of the countries with which Israel trades, including Turkey, Russia and Ukraine.

During the past two years, there was no significant appreciation of the real exchange rate of the shekel as calculated according to various indices (Figure 1.5), particularly in the rate as calculated according to the index based on changes in the nominal exchange rate and based on inflation differentials. This is a new development, since for a number of years, there was a real appreciation resulting from a reduction in the gap between per capita GDP in Israel and that in its trading partners. In the past two years, growth in per capita GDP in Israel has been slower than the median pace in the OECD, and the gap in the level of per capita GDP between Israel and the other advanced economies again widened (Figure 1.6). As a result, the forces for real appreciation weakened, and may even no longer exist.

A number of administrative decisions, including the decisions to reduce VAT and to cancel the television levy, contributed to a decline in inflation in Israel relative to inflation in its trading partners.[10] An increase in competition in Israel apparently also

[10] The decisions to reduce VAT and eliminate the television levy were made in 2015, and contributed to the gap that was created in the past two years between inflation abroad and inflation in Israel. In addition, the decision to lower electricity prices in February 2015 also contributed to the gap. This decision was made after completing the arrangement concerning the compensation given to the electricity company as a result of the crisis in the supply of natural gas in 2012. The three decisions contributed to an inflation gap of about 0.7 percent. The decision to lower the price of water contributed another 0.1 percent.

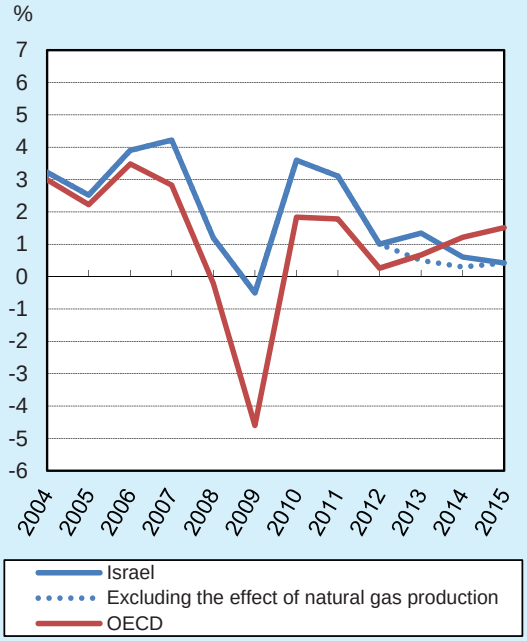
Figure 1.5
Indices of the Real Exchange Rate, 2009–15
(quarterly data)



[a] The G4 countries: US—49%; Eurozone—32%; UK—13%; China—6%.

SOURCE: Based on Central Bureau of Statistics.

Figure 1.6
Per Capita Growth Rate, Israel and the OECD Median, 2004–2015



SOURCE: Based on Central Bureau of Statistics.

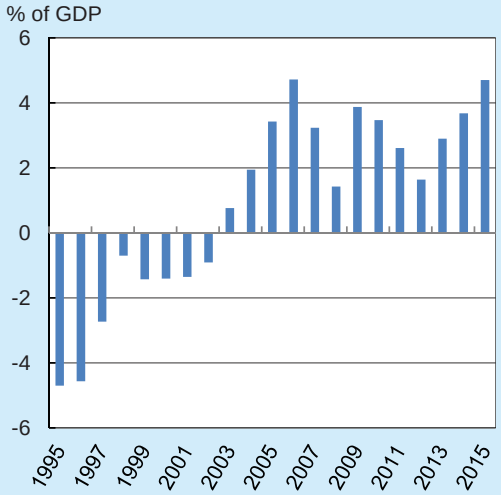
contributed to low inflation, since it creates pressure for price declines. It is possible that these price decreases created pressure for nominal appreciation in the economy, but that was not reflected in a real appreciation. If this is the case, it represents a positive development, even though at the low level of inflation it creates a difficulty for monetary policy makers to support activity.

c. The terms of trade, the current account, and national savings

The terms of trade are equal to the ratio between export prices and import prices, and showed an exceptional improvement of close to 8 percent in 2015. This is a reflection of the decline in energy and other commodity prices and an increase in export prices. This development follows a negative trend in the terms of trade between 2002 and 2008. The improvement in the terms of trade means an improvement in consumer welfare. With the same basket of exports and imports, the surplus in the current account increases, and individuals can purchase more and save more.

The surplus in the current account reached 4.7 percent of GDP in 2015 (Figure 1.7)—high by international comparison—and it is partially explained by the high rate of savings in the economy. Israel has had a current account surplus for more than a decade, and in the past three years, that surplus has again expanded greatly. In 2013 and 2014, it expanded as a result of the start of natural gas production from the Tamar

Figure 1.7
The Current Account of the Balance of Payments, 1995–2015



SOURCE: Based on Central Bureau of Statistics.

Figure 1.8
Gross National Savings, 2008–2015

SOURCE: Based on Central Bureau of Statistics.

natural gas reserve and the reduced need to import energy products, while in 2015, it expanded further due to improved terms of trade.

The gross national savings rate in the economy has been climbing slowly in recent years—reflecting an increase in both private savings and public savings—and is currently high from both a historical perspective (Figure 1.8) and from an international perspective. In 2015, the savings rate increased sharply—about 0.7 percentage points of GDP—to close to 24 percent of GDP, as a result of an increase in both private and public savings. Some of the increase reflects the savings from lower expenditure on the import of energy products. This phenomenon is not unique to Israel, and it may be the result of an assessment that the decline in energy prices is at least partly temporarily.

It is possible that the changes made in the Israeli pension system in the previous decade, and the uncertainty they created for individuals, may have contributed significantly to the high level of savings. The transition to savings through defined contribution pension plans alongside the increase in life expectancy and tax incentives have encouraged individuals to increase their pension savings. Until the transition, many of the risks inherent in pension savings—mainly the yield and the life expectancy risks—were imposed on the pension funds (or on the employers), and individuals were guaranteed a pension regardless of

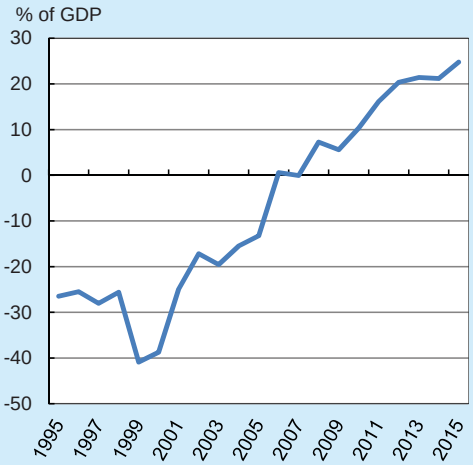
the developments of these variables. Following the transition, these risks are imposed on individuals, and since they are realized to a great extent—expected yields on savings have declined, and individuals are absorbing the ramifications of an increase in life expectancy on pensions—they are serving as an incentive for savings. Another factor in the increase of individuals' uncertainty regarding their income at retirement age, which also incentivizes savings, is the rapid increase made in the middle of the last decade to the age of eligibility for an old age pension and the possibility that the age will again be raised in the coming years.

Two changes to the pension system are contributing to an increase in direct savings as well. First, the fact that the public service has moved from a defined benefit pension to a defined contribution pension: both the government and employees are now allocating money into the employees' pension funds as part of their current expenses, and this deduction increases savings. Second, the Compulsory Pension Law, a measure that took effect in 2008, requires all salaried employees in the economy to save toward pensions, while parts of the population—mainly the weaker segments—had previously saved only a little.

The high rate of savings is, as mentioned above, one of the explanations for the surplus in the current account. The International Monetary Fund found—based on an international comparison—that the surplus in the current account that is in line with the characteristics of the economy is about 2 percent of GDP. This calculation takes into account the demographic characteristics of the economy, potential growth, public savings, the balance of energy, and the structural changes unique to the economy.[11]

The high and constant surplus in the current account leads to a constant increase in the surplus of assets over liabilities in the economy, and particularly in the surplus of debt assets vis-à-vis abroad (Figure 1.9). In 2015, the surplus of assets vis-à-vis abroad totaled $68 billion—about 23 percent of GDP—and the surplus of debt

Figure 1.9
International Investment Position (net assets), 1995–2015

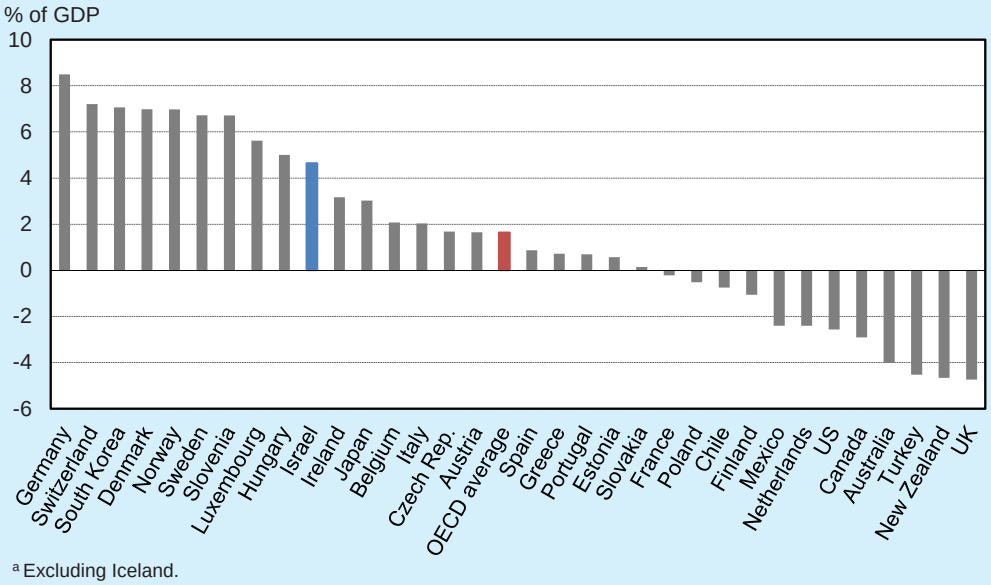


SOURCE: Based on Central Bureau of Statistics.

[11] There are many methods to estimate the current account surplus in equilibrium. The advantage of this method is in the fact that it is based on an international comparison and takes into account the structural parameters of the economy. See: IMF Country Report 15/262, Israel Selected Issues, International Monetary Fund, July 2015. The calculation is based on Lee J., G. M. Milesi-Ferretti, J. Ostry, A. Prati, and L.A. Ricci (2008), "Exchange Rate Assessments: CGER Methodologies", International Monetary Fund, Occasional Paper 216.

assets vis-à-vis abroad totaled $118 billion—about 40 percent of GDP. This surplus reflects the strength of the economy and its ability to absorb shocks, and it lowers the country's risk premium. Past experience shows that countries in similar situations—with a current account surplus and a surplus of debt assets vis-à-vis abroad—are less exposed to crises.[12] However, it is possible that the current account surplus (which exceeds what is expected according to the economy's characteristics) also reflects excess savings and/or underinvestment in the economy. It is possible that these are affected by excess incentives for long-term savings and by caution—a motivating factor that acts on its own in view of the shocks that have hit the global economy in recent years. When there is a high current account surplus and a constant increase in assets abroad, it means that individual savings are much higher than investment in the economy, and it could be possible to reduce the high surplus by higher consumption (private and/or public), or higher investment in infrastructure, and thus to increase the standard of living.

Figure 1.10
The Current Account Surplus in the OECD Countries[a], 2015



[a] Excluding Iceland.
SOURCE: Based on World Economic Outlook, IMF (2015).

12 Many studies show that a high deficit in the current account increases the likelihood of a crisis. It seems that the net balance of debt assets also affects the likelihood of a crisis. See L. Catao and G.M. Milesi-Feretti (2014), "External Liabilities and Crisis", *Journal of International Economics*, 94, pp. 18–32.

d. The housing market

Home prices increased by 8 percent in 2015, with an increase in the volume of mortgages—a combination that indicates the dominance of demand. On the supply side, building starts also reached a high volume in 2015—about 48,000 residential units—but were not sufficient to supply the demand without price increases. Demand for dwellings remains high because there has not been a significant change in the background factors: the real interest rate, the unemployment rate, the rate of increase in wages, and the rate of increase in the population.

In addition to these factors, demand is impacted by the public's expectation regarding price changes, inter alia as a result of government programs: After the volume of transactions declined during 2014, it again increased from the end of that year, since with the bringing forward of elections, the legislative process for the "Zero VAT" and "Target Price" programs was halted. While the government did undertake to lower housing prices, it seems that the increase in purchase tax imposed on investors and the "New Format Buyer's Price" program have not generated expectations for lower prices. The increase in purchase tax is acting in parallel on demand for owned dwellings and on the supply of rental dwellings. It is distancing investors from the market, thereby making it easier to purchase a single home, while at the same time reducing the supply of rental homes.

The "New Format Buyer's Price" program is an additional program that is intended to lower home prices for first home buyers. As part of the program, the government will grant a discount on the price of land and will lower the price of dwellings built on it. The program will not significantly increase the supply of homes, since it will come mainly in lieu of marketing land to contractors on the open market. In other words, the government will subsidize home prices without significantly increasing the supply. It is not clear how the program will affect demand. While families that had not planned on purchasing a home may choose to participate in a Buyer's Price lottery in order to win the government subsidy included in the program, families that had planned to purchase a home may participate in the lotteries and wait to win one of them instead of purchasing a home on the open market. The overall effect of the program on the average price in the market or on the price of a home purchased by a family that did not win a lottery is thus unclear. If the program reaches a significant volume, it will also lower government revenues from the sale of land.

e. Poverty and inequality

Inequality and poverty in Israel are very high by international standards. This is partly the result of relatively minor government intervention in the redistribution of income through transfer payments. The phenomenon can also be attributed to the wide differences in household size between sectors in Israel.

The low government contribution to the reduction of inequality reflects a policy intended to reduce transfer payments and to expand employment rates in all population groups, but mainly among those that receive government support. The reduction of

transfer payments at the beginning of the previous decade—due to a budget crisis—expanded poverty and inequality, and even though an increase in the participation rate led to a moderate decline in these indices starting in 2006, they are still slightly higher than they were at the end of the 1990s and the beginning of the 2000s.

In the past decade, the participation rate of low income groups increased. The percentage of households without a breadwinner and headed by a person of the working age declined from about 10 percent in 2003 to about 7 percent in 2014. There was a parallel increase in the rate of households with two breadwinners. In contrast to transfer payments, participation in the labor force increases the income potential. That is the advantage from the standpoint of the individual. From a societal point of view, this process reduces the tax burden imposed on the rest of the population.

Poverty is exceptionally high among ultra-Orthodox and Arab households, at more than 50 percent. In most ultra-Orthodox households, equivalized disposable income is particularly low. This is mainly due to the average number of people per ultra-Orthodox household, which explains half of the poverty gap between the ultra-Orthodox and other groups. This difference presents a challenge to policy makers: They are interested in reducing poverty, but it is very difficult to reduce it in large families without significantly expanding transfer payments. However, such an expansion could negatively impact the incentive to work. Another part of the income gap between the ultra-Orthodox and others is due to their relatively low labor income partly explained by a lack of skills that could increase their earning power. (The box in Chapter 8 deals with the income of ultra-Orthodox households and how policy changes affect it.) Poverty is high among Arab households (relative to the rest of the population) due to the low of number of households with two breadwinners, the high number of households without any breadwinners, and low wages. In order to reduce poverty among this population group, it is recommended to invest more in education and in affirmative action in the labor market, and to expand the supply of subsidized childcare.

3. GLOBAL DEVELOPMENTS

The growth rate of the global economy slowed slightly in 2015, due to the slowdown in many of the developing economies and stability in the advanced economies. A decline in demand led to a further slowdown in the growth of world trade—a main characteristic of the global economy since the outbreak of the Global Financial Crisis in 2008. A sharp decline in energy and other commodity prices occurred in 2015—oil prices declined by close to 50 percent, while other commodity prices declined by about 20 percent. The sharp declines are explained by changes in the supply side—the use of new technologies to produce oil and natural gas, a change in the conduct of OPEC countries, and the expectations that sanctions on Iran will come to an end—and the slowdown in demand. According to assessments by IMF economists, the sharp decline in energy and commodity prices did not contribute to an acceleration in total global demand in 2015. In their analysis, the decline in the revenue of energy and

commodity exporters reduced demand in those countries to the same extent that it expanded demand in countries that import these inputs, since importers directed the decline in the price mainly to savings.

The US economy—the destination for about one-third of Israel's exports—grew by 2.5 percent in 2015, similar to the rate for 2014, but lower than the rate projected at the beginning of the year. Labor market conditions continued to improve, leading to expectations since the end of 2014 that the Federal Reserve would begin raising interest rates in the first half of 2015. These expectations, together with US economic conditions, led to a stronger dollar around the world. The interest rate increase was delayed to the end of December, when the Fed increased it by 0.25 percentage points. The delay served as an indication that the previous assessments regarding US economic performance were overly optimistic.

The economy of the eurozone—the destination for about one-quarter of Israel's exports—grew by 1.5 percent, higher than the rate of the previous year, and similar to the rate projected at the beginning of the year. However, the unemployment level in the eurozone remained high—above 10 percent—and the output gap derived from the high unemployment level and the low utilization of capital remained high. In response to this and to the low inflation rate, the European Central Bank decided at the end of 2014 to lower the interest rate on deposits by commercial banks to negative values, and also began quantitative easing. These measures sharpen the difference between economic developments in the US and in the eurozone.

The small advanced economies with strong links to the eurozone—Switzerland, Denmark and Sweden—were affected by the situation in the eurozone, and were forced to respond to the policy adopted by the ECB. As a result of the upward pressure on the Swiss franc, the central bank there decided to reduce the interest rate to negative values, and in January 2015 it abandoned the policy that set an exchange rate floor. The interest rate reduction to -0.75 percent did not prevent an exceptional real appreciation of more than 7 percent in 2015. The Swedish Riksbank is conducting an inflation targeting policy, and it also lowered the monetary interest rate to negative values. The Danish and Swedish economies grew by relatively high rates in 2015, as they managed to benefit from accelerated growth in the eurozone and from a relatively depreciated exchange rate. In contrast, the Swiss economy recorded negative per capita growth in 2015, for the first time since 2009.

The slowdown in global growth was a result, as mentioned, of the slowdown in the developing economies. Energy and commodity exporters among them, including large economies such as Brazil and Russia, were significantly impacted by the decline in revenue and the lower demand. In addition, China encountered a slowdown as a result of the necessary transition from an economy with export-based growth to one with growth based on domestic demand. Disappointing economic data from China and doubts about its growth led to a drop in share prices there. These in turn led to sharp declines and increased volatility in the global financial markets. These declines resumed, and grew even stronger, in January 2016, again raising concerns of a delay in the timing of the advanced economies' return to stronger, sustainable growth rates.

Table 1.3
Main developments, 2010–15

	2010	2011	2012	2013	2014	2015
Mean population (million)	7.6	7.8	7.9	8.1	8.2	8.4
Nominal GDP (NIS billion, current prices)	876	937	1,001	1,056	1,094	1,150
Per capita GDP (NIS thousand, current prices)	115	121	127	131	133	137
Goods and services exports ($ billion, current prices)[a]	73	83	87	88	89	85
Goods and services imports ($ billion, current prices)[a]	69	83	85	84	85	77
Current account of the balance of payments (surplus, $ billion)	8.1	6.8	4.3	8.5	11.2	13.8
Overall government deficit (as a percentage of GDP)	3.5	2.6	4.2	3.6	2.8	2.4
Public debt (as a percentage of GDP)	70.5	68.7	67.8	67.2	66.7	64.8
Employed persons in Israel (thousands)	3,159	3,252	3,359	3,450	3,556	3,644
Real wage per employee post (yearly average, percent change)	0.7	0.4	0.5	0.9	1.1	3.0
Nominal yield on 10-year government bonds	4.9	5.1	4.6	4.0	3.1	2.2
Real yield on 10-year government bonds	2.2	2.5	2.1	1.6	1.0	0.5
GDP	5.5	5.0	2.9	3.3	2.6	2.5
Private consumption	4.8	3.4	2.2	3.9	3.7	4.9
Unemployment rate	8.4	7.1	6.9	6.2	5.9	5.3
Exports (excluding diamonds)	12.6	8.0	5.0	-0.6	2.6	-1.2
Inflation	2.7	2.2	1.6	1.8	-0.2	-1.0
Bank of Israel interest rate	1.6	2.9	2.3	1.4	0.6	0.1
Real one-year interest rate	-0.4	0.6	0.2	-0.3	-0.7	-0.5
Real effective exchange rate	-4.4	-1.1	5.3	-5.7	-1.3	-0.1
NIS/$ exchange rate (yearly average)	3.73	3.58	3.86	3.61	3.58	3.89
Tel Aviv 100 index[b]	14.9	-20.1	7.2	15.1	6.7	2.0
Global trade	12.5	6.7	2.9	3.3	3.4	2.6

[a] Excluding diamonds.

[b] 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.

4. ECONOMIC POLICY

a. Monetary policy

The main macro data upon which monetary policy decisions were based—moderate growth, negative inflation, and the fact that 12-month inflation expectations declined to below the inflation target range—led the Monetary Committee to decide to continue monetary accommodation in 2015. The Committee took into consideration the risks embodied in home prices increases, and mainly from increased mortgages. Based on these considerations, it reduced the monetary interest rate to 0.1 percent in March and continued to use foreign exchange purchases to support activity and to increase

inflation. Beginning with the interest rate decision for November, the Committee notes that its "assessment is that monetary policy will remain accommodative for a considerable time." This note sets the Monetary Committee's policy apart from the policy adopted by the US Federal Reserve, lowers the pressure for appreciation, and supports an increase in inflation.

The monetary interest rate came close to the zero lower bound in 2015, for the first time ever, making it difficult for policy makers to expand policy further and to a certain extent acted to reduce the monetary easing. This can be demonstrated by key variables in the banking system and in the capital market, which are briefly reviewed below: (1) the transmission between the Bank of Israel interest rate and the interest rate on short-term deposits at the banks weakened greatly, and basically only about half of the two most recent interest rate reductions—in September 2014 and in February 2015—was reflected in the interest rate on the public's deposits at the banks. One of the main channels of monetary policy—acting on households' bank deposits—was therefore muted. This phenomenon is not unique to Israel, because banks want to provide their customers with a positive interest rate (or at least one that is not negative). Nevertheless, it reduces the effectiveness of monetary policy near the zero lower bound. (2) The Bank of Israel interest rate declined at a pace similar to the decline in one-year forward inflation expectations, and perhaps even more slowly.[13] Even though the Monetary Committee was concerned about it, the Committee chose not to reduce the interest rate to below its current level. As a result, the real short-term yield became positive in 2015, after a long period in which it was negative. (3) Medium-term (1–5 year) inflation expectations declined to below the midpoint of the inflation target range. These expectations are somewhat adaptive, but the decline supports the assessment that the public is concerned that the tools available to the Bank of Israel will not make it possible to return inflation to the midpoint of the target range in the short term, or the public's assessment is that the sources for price declines do not require a monetary policy reaction, so policy makers did not act to reduce them.

The Monetary Committee decided not to use unconventional tools, including negative interest rates and quantitative easing. First, their assessment was that in light of low unemployment and strong private consumption, the use of unconventional tools was not required. Second, policy makers' assessment was that the low and negative inflation is only a temporary situation resulting to a large extent from supply factors. Furthermore, the Monetary Committee's assessment was that such tools involve financial risks, and global experience is too short to provide information as to how effective they are. Moreover, during the year there were projections that the Federal Reserve would increase the interest rate in the US, which supported their decision, since such an increase tends to support depreciation. Nevertheless, the Monetary Committee chose to increase foreign exchange purchases and to signal to

[13] According to data relating to December 2015 relative to December 2014, the Bank of Israel interest rate declined more slowly than inflation expectations. In terms of yearly averages, it declined in 2015 at a similar rate.

the public that monetary policy would remain accommodative for a considerable time. The Committee expected these measures to have an impact on inflation expectations and on actual inflation.

The Bank of Israel made significant foreign exchange purchases in 2015—exceeding $1 billion—in three episodes. In February and March, it purchased a combined $1.6 billion ($0.8 billion net of purchases made as part of the program intended to offset the effects on the exchange rate of natural gas production) in response to a developing trend of appreciation in the nominal effective exchange rate. The Bank of Israel intervened in the foreign exchange market in those months as part of the program intended to moderate excessive volatility in the nominal exchange rate. Since there is no consensus in the economic literature regarding how to calculate the equilibrium exchange rate, the Monetary Committee takes into account the assessments derived from a number of models, including models constructed by the Bank of Israel's Research Department. The average of the assessments showed that the exchange rate was excessively appreciated relative to the equilibrium exchange rate. The Research Department's models showed that the excessive appreciation in 2015 was smaller than in 2013 and in 2014. The two other purchases were made in June and in December. At the end of the year, the real exchange rate remained stable over the course of 2015, due in part to the interventions in the foreign exchange market.

b. Fiscal policy

The overall government deficit totaled 2.4 percent of GDP in 2015, 0.4 percentage points lower than the deficit in 2014. The decline in the deficit, alongside the increase in nominal GDP, led to a decline of about two percentage points in the public debt, to 65 percent of GDP. This is lower than the average in the advanced economies, and is not far from the 60 percent level that has been Israel's target for many years. The decline in the deficit and in debt in recent years is mainly the result of the fiscal consolidation that began in 2013, after the deficit increased in previous years. Even though the consolidation was necessary and contributed greatly to lowering the cost of financing of the government and the economy[14], it also contributed negatively to economic growth. The reduction of the government deficit, particularly the structural deficit, leaves the government a broader fiscal space to support economic activity if needed. However, even though the unemployment rate is historically low, the government chose to pre-emptively exploit the "fiscal space" in the 2016 budget in order to markedly increase public expenditure and reduce tax rates by more than 1 percent of GDP. These are expected to support growth in 2016. Alongside this, the

[14] Brender and Ribon find that since a low deficit reduces the debt to GDP ratio, it contributes significantly to a reduction in the interest on government debt. Since the consolidation program was instituted, the gaps between the interest rate on Israel Government bonds and the interest rate on bonds of other advanced economies narrowed by more than one percentage point. See Brender, A. and S. Ribon (2015), "The Effect of Fiscal and Monetary Policies and the Global Economy on Real Yields of Israel Government Bonds" Bank of Israel Research Department, Discussion Paper 2015.02.

government approved programs with significant costs for 2017 as well.[15]

The decline in the government deficit in 2015 was not planned—neither according to the budget that the previous government submitted to the Knesset, nor according to the budget that the current Knesset approved in the end. The decline was mainly a result of increased government revenue, which was due to an increase in real estate transactions, an increase in private consumption, and an increase in the profitability of the business sector. This increase reflects the functioning of the "automatic stabilizers", but the fact that growth has become based on private consumption—as well as the robust real estate industry—"activated" the "automatic stabilizers" so that tax revenue increased even though real growth remained low. In response to the increase in revenue, and against the background of policy intended to lower the cost of living, the government lowered VAT in September, effective immediately—a progressive measure with the effect of increasing demand, although in view of the uncertainty regarding how permanent the increase in revenue is, it would have been proper to consider reducing public debt, especially since such a tax reduction reduces the government's ability to expand its services. In addition, the government decided to reduce corporate taxes starting at the beginning of 2016—also a step that supports activity.

The government operated for most of the year without an approved budget. In such a situation, the Accountant General at the Ministry of Finance manages government expenditures in accordance with the rules set out in law. Those rules restrict the expenditure to the operation of essential services and to activities included in the previous budget law. As a result, the government reduced its expenditures in the first four months of the year, thereby impacting economic activity during the year. Later in the year, the government increased the pace of expenditures, and by the end of the year, expenditures as a share of the budget reached the level it had reached in normal years. Budget performance by the social ministries was 2 percentage points lower than the average performance in normal years, and defense expenditures were higher than the average.

The government decided to increase the expenditure base in the budget by 2 percentage points starting in 2015. This reflects the composition of the new coalition, since it supports an increase in government expenditure to benefit weaker population groups. Child allowances were increased, and it was agreed to subsidize water and public transportation in order to lower their prices by the equivalent of the VAT. The decision to raise the expenditure ceiling, alongside the tax decreases, led to an increase in the deficit target to 2.9 percent of GDP. In addition, the government approved programs in the real estate market that were not recorded in the budget, the cost of which will exceed NIS 3 billion in 2016.[16] The implementation of these programs is also expected to support activity in 2016.

[15] See "Fiscal Survey" in Bank of Israel (2015), *Recent Economic Developments*, 140.
[16] See "Fiscal Survey" in Bank of Israel (2015), *Recent Economic Developments*, 140.

c. The reform in the financial system

The Ministry of Finance recently began encouraging financial reforms. Increasing the access to credit may improve economic wellbeing, but it must be remembered that financial behavior is different from other areas, and players in the financial market may respond differently than expected. Since a financial crisis may cause significant economic disruptions, it is necessary to proceed cautiously when implementing financial reforms, while learning from international experience. Adopting policies to increase credit supply to households and small and medium businesses at a time when there are already rapidly increasing may led to excessive-leverage. The finance literature emphasizes the importance of striking a balance between competition and stability of the system.

In June, the Minister of Finance and the Governor of the Bank of Israel appointed a committee to increase competition in banking and financial services that are common in Israel (the "Strum Committee"), and the committee submitted an interim report in December. In that report, the committee recommends, among other things, separating the credit card companies from the large banks, so that they can compete with them and offer credit to businesses and households. According to the interim recommendations, the companies will receive protection: For a certain period, the banks will be permitted to distribute only credit cards with a nonbank line of credit or debit cards. This recommendation may create an oligopoly in the issuing of credit cards, and lead to a negative impact on consumers. In parallel, the committee recommended to increase competition in the clearing market by making the terms for obtaining a license to operate more flexible, a recommendation that has already been implemented by the Banking Supervision Department. It also recommended switching from monthly settlement to daily settlement. It also recommended enabling nonbank corporations affiliated with institutional investors to raise capital through unlimited public bond offerings, which currently requires approval from the Bank of Israel according to the Banking Law. The recommendation to entrust the supervision of these entities, including prudential supervision, to the Commissioner of Capital Markets, Insurance and Savings, was made in opposition to the position expressed by the Bank of Israel's representatives on the committee.

Another interim recommendation made despite the position expressed by the Bank of Israel's representatives is to enable pension savers to borrow money backed by their pension savings. This is a far-reaching recommendation, since it makes it possible for savers who prefer present consumption over future consumption to use pension money for current consumption. This is contrary to the government's policy of encouraging long-term savings that will ensure retirees reasonable living conditions. Moreover, the government is encouraging pension savings through tax benefits given for both deposits and accumulated balances (exemption from capital gains tax). Early withdrawal of savings (mainly if the withdrawn amount is not repaid) would mean exploiting these benefits for short-term use.

Expanding the number of companies providing credit to households is not expected to lead to a significant decline in the cost of credit without complementary measures. In

contrast to housing credit, consumer credit is generally issued without collateral, and its efficient pricing is essential if new credit providers are to compete with the banks. The Bank of Israel took upon itself the responsibility to establish a credit register—the establishment of which is regulated by the Credit Information Bill. The register is expected to enhance competition, since it will gather information on borrower quality and make it more accessible. Private and public databases of this type exist in many countries, and there is empirical evidence that they contribute to an increase in the volume of credit, a decline in bankruptcy rates, and a lower average cost of credit.

Another team—the team to regulate non-institutional financial activity—was established following the establishment of the government, and its recommendations are currently in the process of legislation. According to the proposed bill, a regulator will be appointed to supervise currency service providers and small non-institutional credit providers. Such a regulator is essential in order to protect consumers, prevent money laundering, and lower the risks to the financial system and to the economy as a whole as a result of the activities of these financial entities.

5. NATURAL GAS

a. Redundancy and the development of the "Leviathan" reservoir

Since the agreement to import natural gas from Egypt collapsed in 2011 and the natural gas from the "Yam Tethys" site was depleted in 2012, a serious shortage of natural gas developed in the economy, and electricity production expenses increased significantly. The connection of the "Tamar" site to the Israeli coast in 2013 made it possible for the economy to again base electricity production on natural gas. Currently, about 50 percent of electricity production is based on natural gas, which is cheaper and cleaner than relevant alternatives (coal, diesel or oil).[17]

However, much of the electricity production remained dependent on a single natural gas reservoir, a single barge for handling the gas, and a single pipeline to bring it from the barge to the coast. The vast majority of the natural gas comes from the Tamar site, and a minority is imported by ship as LNG to a buoy where it is re-gasified as it is offloaded into the pipeline.

The buoy is the connection point allowing for an additional amount of gas in case the flow from Tamar is halted for maintenance or during peak hours.

The infrastructure for transporting the gas from Tamar is already unable to fully supply peak-hour demand, and since demand increases over time, the infrastructure limitation will become more serious, and the cost inherent in it will increase. Moreover, a significant breakdown in one of the units in the supply chain is expected to cause a serious crisis in the electricity market. In the best case, the economy will overcome it

[17] Due to a sharp decline in coal prices, the direct cost of producing electricity through coal became less expensive than production based on natural gas from "Tamar". However, natural gas is preferable from the standpoint of air pollution.

by purchasing expensive alternative fuels, and in a less favorable case, there will be prolonged electricity interruptions because demand will exceed production capacity. Investment in expanding the infrastructure therefore is extremely important both from a direct economic standpoint and in terms of managing the risk of a breakdown or damage to the existing infrastructure. This is the best way to solve the problem inherent in dependence on a single infrastructure.

The best way to solve the problem of dependence on a single reservoir is to develop "Leviathan".[18] The development of Leviathan will significantly increase supply and will prevent upward pressure on prices, while not developing it will limit supply in the short term and will signal developers in the industry that it is not worthwhile exploring for natural gas in Israel's economic waters. All parties therefore have an interest in developing Leviathan.

Since the government chose to leave the natural gas and oil exploration and production industry, the private sector finances the investments in it exclusively. This approach—government management through the formulation of rules, without direct participation in investment—is accepted in the industry. Investments are made in accordance with the profit considerations of the developers, and they are generally in line with the long-term preferences of all parties. However, occasionally the development of a reservoir is not financially worthwhile for the developers, and there is room to consider government investment, or the provision of guarantees to finance the investments, with the objective of improving social well-being.

Such a situation may develop if the private sector does not succeed in developing the Leviathan reservoir. Development of the reservoir is of special importance to the reliability of the supply of electricity in the economy. However, the consideration of redundancy does not guide the credit providers financing the development, and without contracts of sufficient volume and security, the private sector will have difficulty financing the development of the reservoir. If the developers do not manage to finance the development, it would be worthwhile for the government to assist them in return for a share in the profits from the sale of the gas.[19]

b. The price of natural gas

The price of natural gas was the focus of the public discourse that developed in recent years surrounding regulation of the industry. The existing monopoly requires the government regulator to constantly examine gas prices in the market in order to make sure that the monopoly does not exploit its power to generate profit at the expense of consumers.[20] The gas outline plan tries to minimize the burden inherent in a constant

[18] The development of "Karish" and "Tanin" will also solve the problem of redundancy, but taking into account the volume of natural gas at those sites, the cost of development is higher than the cost of development of "Leviathan".

[19] We do not deal here with the legal question concerning the developers' rights if they can't finance the development of the reservoir. We relate to the existing gap between the government and the developers from the standpoint of economic feasibility.

[20] This refers to the generation of profit from the exploitation of the monopoly's power.

examination of prices in two stages. In the first stage, price ceilings were set with the agreement of the developers, which will make it difficult to create price discrimination between consumers, and may even prevent it.[21] In the second stage, the developers are required to sell "Karish" and "Tanin" in full and to sell part of their rights in "Tamar", which may create competition and will in any case reduce the power of the natural gas providers to raise prices.

It is not simple to determine the correct or fair price of natural gas in the economy. Broadly speaking, when products are traded in international markets, competition generally ensures that the price in the domestic market will be similar to the price abroad. When there is no competition in the domestic market, the international price can serve as an indication of the desirable price in the domestic market. However, natural gas has no uniform price in international markets, because shipping costs are high, and because its price in each market is heavily impacted by supply and demand and by the level of competition in that geographic area.[22]

As a result of the shipping costs, there is a gap between the net return on exports received by exporting countries and the import price paid by importing countries. This gap may be close to 100 percent, and depends, inter alia, on the bargaining power of buyers and sellers and on the shipping distance. In order to determine a price that will ensure efficiency in the domestic market, it must be determined whether the economy is a natural exporter of gas or a natural importer of gas.[23] If it is a natural exporter, then the price that ensures efficiency is equal to the net price that can be received for gas exports. If the economy is a natural importer, then the price that ensures efficiency is equal to the import price (discounted by time to the beginning of the import), in other words to the alternative cost of using domestic natural gas.

c. The use of natural gas in manufacturing and transportation

In 2014, manufacturing used about 2 BCM of natural gas, constituting slightly more than 25 percent of total natural gas consumption in the economy. The conversion to natural gas in manufacturing took place until recently at large plants, and the inclusion of smaller potential consumers was delayed, mainly because connecting them to the distribution infrastructure in the industrial zones is slow. Manufacturers decide whether to convert mainly based on the cost of use of natural gas relative to the

[21] A discussion of price ceilings appears in Friedman, Y. (2016): "The Natural Gas Production Industry: Government Policy Seven Years After the 'Tamar' Discovery", Bank of Israel, Periodic Paper 2016.01.

[22] We do not compare natural gas prices here. Such a comparison can be found, for instance, in Knesset Information and Research Center (2014), "The Effect of Natural Gas and its Price on the Economy and Manufacturing" (in Hebrew), and in "Energy Prices and Taxes", Quarterly Statistics, International Energy Agency. With that, price comparisons in this field involve difficulty due to differences in production and transportation costs, and because contracts in the industry are long-term—contracts signed at different points in time may include different price terms.

[23] The phrase "natural exporter" means that in the foreseeable future, the domestic reservoirs will be able to supply the domestic demand for natural gas at export prices. "Natural importer" means that the domestic gas reserves are expected to be depleted in the foreseeable future, and the economy will begin importing natural gas.

alternative cost. But from the point of view of the economy as a whole, the differences in externalities—air pollution and the use of a nonrenewable resource—created by the use of each of the alternative fuels must also be examined.[24]

The use of natural gas is less polluting than the burning of diesel or oil. Therefore there is an interest in causing manufacturers to prefer natural gas over the alternatives. A preference should be created through taxation of diesel and oil for industrial use, according to their cost of pollution. Diesel is currently heavily taxed. The excise imposed on it includes a component based on the externality derived from the use of it in transportation. In contrast, oil is taxed minimally, which leads manufacturers to prefer it over natural gas—a preference which strengthened in the past year in view of the sharp decline in oil prices. Therefore, in many cases, the use of oil in manufacturing is less expensive than the use of natural gas, despite the cost of pollution. Excise tax on oil should therefore be increased in order to take the cost of pollution into account, and through this increase, to support the demand side in establishing the infrastructure to connect the natural gas reservoir to the coast.

In terms of the use of a nonrenewable resource, as explained above, if the assessment is that there is a high likelihood that the natural gas in the reservoirs will be depleted in the foreseeable future, it would be correct to impose a tax on its use that will reflect the alternative—imported gas is relatively expensive. Such a tax would ensure that manufacturing uses domestic gas cautiously and takes into account its future import costs.

Natural gas does not serve manufacturing only as a source of energy, but also as raw material for production—for instance ammonia. The production of raw materials from natural gas exists only where the price of natural gas to the domestic economy is sufficiently low to compete with foreign producers of the material. If the assessment is that the natural gas from the domestic reservoirs is expected to be depleted within a relatively short amount of time, and the alternative price of natural gas in the economy is equal to the (discounted) import price, we may see that its conversion to other raw materials is not an efficient use of it.

Similarly, we may see that it is not efficient to use natural gas in the transportation field when the global price of oil is at a low point. In order to examine this, we must compare alternatives assuming that taxation does not discriminate against one of them. Gasoline and diesel are currently highly taxed, reflecting both the air pollution they cause and the crowding caused by the use of vehicles. In contrast, there is low taxation on the use of natural gas, and from the standpoint of the consumer, this fact creates an unjustifiable preference for the use of natural gas in transportation. If natural gas is used in the transportation field in the future, it would be correct to adjust the tax on its use to the externalities inherent in the use of vehicles.[25]

[24] Particularly if we view the economy as a natural importer of natural gas, meaning if we believe that the domestic gas reservoirs will be depleted in the foreseeable future.

[25] A similar problem currently exists concerning the question of whether it is worthwhile to use liquefied petroleum gas (LPG) instead of gasoline. The tax differentials between the fuels must only reflect differentials in the air pollution they cause, but in practice, the differentials are large and apparently reflect the fact that gasoline is mainly used in the transportation area and LPG is not mainly used in this area.

Table 1.4
Economic indicators: International comparison[a], 2003–14

	Average 2003–07				Average 2008–14				2015			
	Israel	US	Eurozone	OECD	Israel	US	Eurozone	OECD	Israel	US	Eurozone	OECD
GDP growth rate	4.5	2.9	2.2	2.8	3.4	1.0	-0.1	0.9	2.5	2.4	1.6	2.0
Per capita GDP growth	2.6	1.9	1.7	2.1	1.5	0.3	-0.3	0.2	0.5	1.6	-	-
Per capita GDP ($ thousand, current prices)	21.3	44.0	30.7	30.9	32.6	50.2	36.8	37.0	35.4	55.9	-	-
Population growth rate	1.8	0.9	0.5	0.7	1.9	0.8	0.4	0.6	2.0	0.8	0.4	0.6
Civilian labor force participation rate, ages 25–64	75.3	79.0	-	75.3	77.9	77.9	-	76.3	79.8	-	-	-
Unemployment rate	11.5	5.2	8.6	6.4	7.4	7.9	10.3	7.6	5.3	5.3	11.1	6.8
Inflation rate (during the year)	0.8	2.9	2.1	2.5	2.5	1.9	1.7	2.1	-0.6	0.1	0.0	0.6
Exports (percent of GDP)[b]	32.8	10.0	36.4	24.0	31.5	12.9	41.1	27.3	28.7	12.4	-	-
Gross investment (percent of GDP)	20.1	22.6	22.6	-	19.6	19.2	20.8	-	19.4	20.3	19.1	-
National savings (percent of GDP)	22.9	17.8	23.2	-	22.4	16.5	22.1	-	24.1	18.2	22.9	-
Current account (percent of GDP)	2.8	-5.1	0.1	-1.2	2.8	-2.9	0.7	-0.5	4.7	-2.5	3.0	0.2
Public expenditure (percent of GDP)[c]	43.2	33.8	46.4	39.4	39.5	38.0	49.4	42.7	39.0	36.0	48.7	41.1
Tax revenue (percent of GDP)[d]	33.1	25.6	36.1	33.8	30.1	24.3	36.5	33.5	30.9	-	-	-
Gross public debt (percent of GDP)[c]	84.9	63.3	67.6	76.4	69.5	95.0	84.2	103.4	64.8	104.9	111.2	115.2

[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] Deficit and expenditure data for Israel are adjusted to the accepted international definition.

[d] 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.

SOURCE: International Monetary Fund, OECD and Bank of Israel.

Box 1: Long-Term Trends in the Supply and Demand of Electricity in Israel

The production and supply of electricity are usually concentrated at a small number of companies, since significant economies of scale exist in this sector, particularly in the segment of transmission. This concentration, and the fact that advanced economies are dependent on the reliable supply of electricity, requires regulation and supervision of the sector, which if carried out efficiently, can reduce production costs (which are primarily determined by the capital invested in the building of power stations and by the cost of fuel).

Accordingly, many countries regulate the supply of electricity, even in markets that transitioned to a competitive structure. This control requires the accurate prediction of future electricity consumption, since it is desirable to avoid both undercapacity, which may disrupt the supply of electricity to consumers, and overcapacity, which imposes unnecessary capital costs on the economy. Forecasting future demand makes it possible to optimally plan the number and types of additional power plants that will be required and to sign long-term contracts for the supply of fuels.

This survey presents several of the main characteristics of the supply and demand of electricity in Israel, which may be expected to influence the planning of the electricity system in coming years.

1. The demand for electricity in Israel during the coming decades

Long term planning for the electricity sector necessitates forecasting the demand for electricity. It is generally assumed that the rate of growth in electricity demand parallels the rate of growth in GDP.[1] However, a closer examination reveals a different picture. Thus, although changes in the level of economic activity have a considerable impact on changes in the demand for electricity, there are also additional factors, primarily the relative price of electricity, the composition of GDP, the availability of electricity substitutes, consumption habits of households and technology, which also play a part. These factors affect the intensity of electricity use, which is defined as the amount of electricity used per unit of output.

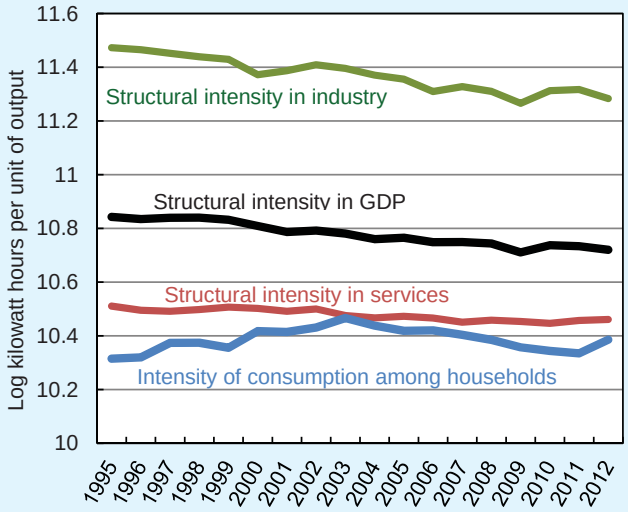
The rate of growth in economic activity (GDP): This is the most important factor in the determination of the demand for electricity. A high level of economic activity, accompanied as well by a rise in the standard of living, increases demand and vice versa. According to forecasts, GDP in coming years will grow at a slower rate than it did in recent decades (due to, among other things, the lower rate of growth in the working-age population) and therefore it is expected that the consumption of electricity will also grow at a slower pace than in the past.[2]

The price of electricity: An analysis conducted by the Bank of Israel shows that the price of electricity directly influences the consumption of electricity by households—an increase in price reduces consumption of electricity by about 25–30 percent of the change in price, and vice versa. The price of electricity has an indirect

[1] See "Recommendations of the Steering Committee for the Reform of the Israel Electric Corporation and the Electricity Sector", March 2014. (Hebrew)

[2] Changes in the growth rate of the working-age population, due to, for example, a wave of immigration, are likely to accelerate the rate of increase in GDP. Other changes, such as an increase in the growth rate of segments of the population that are characterized by low employment rates and levels of productivity, are liable to moderate it. The planning of the electricity sector should take this uncertainty into account.

Figure 1
Intensity of Electricity Consumption among Industries and Households, 1995-2012



SOURCE: Based on Central Bureau of Statistics .

effect on the manufacturing and service industries: an increase in price reduces the elasticity of electricity consumption with respect to growth in GDP. That is, a decline in the price of electricity leads to greater marginal investment in electricity-intensive technology. This may reflect the gradual relative expansion of electricity-intensive industries at the expense of other industries and/or an increase in the intensity of electricity use in all industries.

The composition of GDP: The structural changes in Israel's economy have also influenced the demand for electricity by way of the elasticity of electricity consumption with respect to growth in GDP. In recent decades, the share of service industries within Israeli GDP has increased, and since the intensity of electricity use in services is less than that in manufacturing, the result has been a drop in the intensity of electricity use in the Israeli economy. Furthermore, within both the service and manufacturing sectors, the share of industries with relatively low electricity usage has grown. In manufacturing, the share of high-technology industries (pharmaceuticals and electronic components) has grown, as has the share of financial and other business services within the service sector. These trends can be seen in Figure 1, which shows that the structural intensity of electricity use in the various industries of the economy, i.e. the intensity resulting from structure[3], has been characterized by a prolonged decline over the last two decades. If these trends continue, they are expected to lead to a continuation of the decline in the intensity of electricity use and a reduction in the rate of increase in demand for electricity relative to GDP.

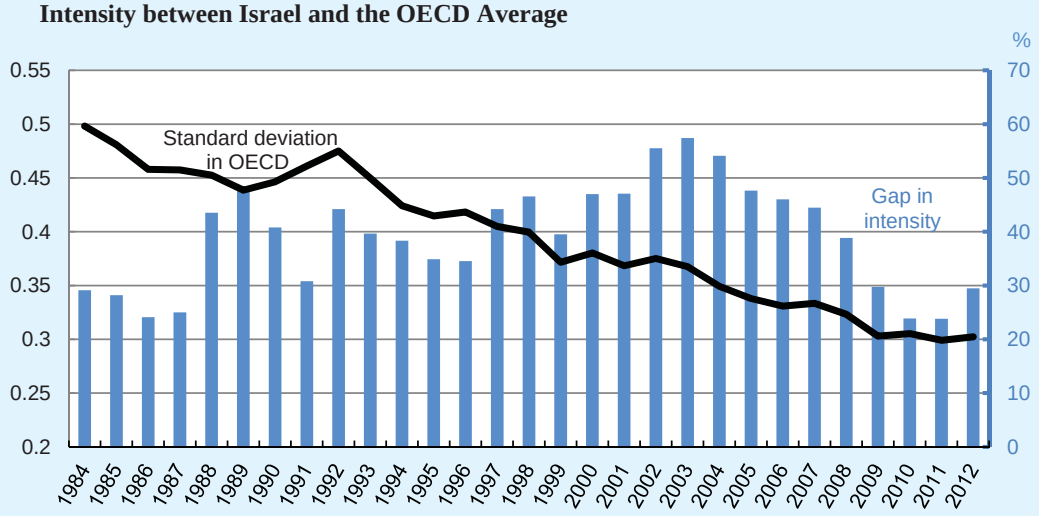
Availability of electricity substitutes: The reform in the fuel sector in the early 1990s led to a significant drop in the intensity of electricity consumption. Among other things, the reform permitted fuel products to be freely imported and these products (primarily fuel oil) serve as a substitute for electricity in production processes in some industries. A similar process may take place in Israel during the coming decade when natural gas, which is a close substitute for electricity, becomes more available to energy-intensive factories and perhaps also to households for heating. Thus, the greater use of natural gas will moderate the growth in demand for electricity in Israel.

[3] In order to calculate the structural intensity of each sector, we took the proportion of each industry in the sector's output and multiplied by its electricity consumption per unit of output (according to the input-output tables for 2006). The intensity of electricity consumption among households is calculated as the expenditure on electricity consumption divided by total private consumption.

Consumption habits of households: Households account for about 30 percent of the economy's total consumption of electricity. This share has been quite stable since the beginning of the 1990s and reflects a lower rate of growth than that of GDP. Household consumption has grown at a moderate rate even though there has been a massive increase in the installation of residential air conditioners during the last two decades. Since the proportion of households owning an air conditioner is expected to reach close to 100 percent by the beginning of the next decade, it can be expected that there will be a subsequent drop in the rate of growth in the consumption of electricity by households.

These findings, i.e., the past decline in the intensity of electricity use and the forecast that this trend will continue in coming decades, are consistent with the significant downward trend in OECD countries since the 1970s, which was accompanied by a narrowing of differences between the various countries. This is reflected in Figure 2 which indicates that, during the last decade, the intensity of electricity use by the Israeli economy declined toward the OECD average and that the variation between countries is gradually disappearing as intensity declines.

Figure 2
Convergence of Intensity of Electricity Use in OECD Countries and the Gap in the Intensity between Israel and the OECD Average



SOURCE: Based on OECD.

2. The supply of electricity in Israel during the coming decades

Electricity production in Israel is expected to become less concentrated in the coming decades, which is due in large part to the increased availability of natural gas and the transition to the use of renewable energy. These trends have a major impact on the planning of the supply of electricity in Israel since they lead to greater flexibility in planning, while at the same time they require building greater reserve production capacity, which will exceed the expected rate of growth in total demand. This reserve capacity will become

necessary since the production of electricity from renewable sources (such as solar energy) varies during the course of the day, by season, and from year to year.

Until 2013, the Israel Electric Corporation (IEC) produced almost all of the electricity in Israel, apart from a small amount produced by factories. Since 2013, a significant amount of privately owned production capacity has been added and already in 2016 private producers are expected to account for about 30 percent of the electricity in Israel. This change is the result of the government's decision to halt the construction of any additional power plants by the IEC, as well as technological innovations. Most of the electricity produced in the new private power plants is sold in bilateral deals to private consumers and the rest is sold to the IEC. In coming years, additional producers are expected to enter the market and the share of private production is expected to reach about 40 percent. The integration of private producers into the system will require the development of mechanisms for coordination between the private producers and the national electricity grid. This is because the national electricity grid is obligated to purchase the surplus production of the private producers, while producers' first obligation is to their private customers. Therefore, the private producers cannot commit themselves to the timing or quantity of delivery to the national system.

The size of the gas reserves off the coast of Israel enables Israel to expand the use of natural gas in the economy over the course of the next few decades. The expanded availability of natural gas will make it possible to establish relatively small power plants, which will produce electricity for self-consumption and will sell the surplus to the electricity system. This change is likely to be beneficial for large consumers (such as kibbutzim, shopping malls, hospitals and factories). However, the exit of these consumers from the national electricity grid will not necessarily make it possible to reduce, in parallel, the production capacity of the system, since they will continue to rely on the national system for backup.

Another process that is expected to have an impact on the structure of the electricity sector in Israel is the transition to renewable energy. This process is driven by increased undertaking of international standards regarding environmental issues, as reflected in the Climate Change Conference in Paris in 2015. However, this process is dependent on overcoming fairly significant engineering and statutory barriers.[4] Up until now, the proportion of electricity produced from renewable energy in Israel stood at less than 2 percent. However, following decisions by the government leading up to the conference, this proportion is to grow to at least 13 percent within a decade and to at least 17 percent by 2030.

In addition to the pressure originating from international norms, another important development is the decline in the cost of renewable energy from solar panels as a result of technological innovation. The cost of solar energy is expected to eventually equal the cost of producing energy from conventional sources, such as natural gas. However, the large-scale introduction of renewable energy will require the expansion of the capacity of the electricity network. Furthermore, there are still major technical barriers in the field of solar energy, primarily the development of the ability to store electricity at low cost (since solar energy can be produced only during the daytime and is also affected by weather conditions). The existence of these barriers means that the system will require reserves of production capacity in order to meet demand during the nighttime and on cloudy days.[5] Therefore, the technological changes will at

[4] A full survey can be found in Recent Economic Developments 140, Bank of Israel, 2015.

[5] Technological developments in the storage of electricity may provide a solution to this problem in the future.

the same time require the judicious management of the electricity supply system.

3. Conclusion

The rate of growth in demand for electricity is expected to slow during the coming decades, among other reasons due to the growth in the share of industries that are not electricity-intensive. On the supply side, it is expected that there will be greater dispersion of electricity production among various producers (accompanied by greater potential for the activity of small producers who will produce electricity from natural gas and renewable energy) and greater use of renewable energy.

While the more moderate growth in demand will make it possible to expand production capacity at a relatively moderate rate, the increasing number of producers, which is partly due to the potential for private production in relatively small facilities, and the use of renewable energy will require significant reserve capacity in the central system, with its accompanying cost. In order to reduce this cost, it is important to develop tools for regulating demand. To this end, it is possible to exploit the proven effect of changes in the price of electricity on the demand for electricity and to make use of existing technologies, such as electronic consumption meters, in order to enable the pricing of electricity according to the variation in demand during the day. At the same time, it is possible to use existing technologies to develop a mechanism that will shift the costs of backup onto the entities that choose to establish independent production facilities, in order for the burden not to be borne by consumers in general.

The trends on the production side are increasing the complexity of the system, but at the same time are reducing the risks involved in forecasting demand, and they will apparently make it possible to maintain smaller safety margins in the planning of production capacity. This is because in coming years it will be easier and cheaper to adjust production capacity to unforeseen changes in demand. This flexibility will be made possible by the production of electricity using natural gas and solar energy in small, and even micro, facilities, in contrast to production using coal or oil (the dominant sources of energy in the past) which requires huge facilities (with all that it implies for construction time, allocation of land, and use of engineering, financial, administrative and statutory resources).

The systemic significance of these various trends is that the electricity sector in Israel will become increasingly complex in coming years, and in turn it will become even more important to have a professional planning and regulatory capability to deal with these challenges.