

The Israeli Economy: An Overview

Benjamin Bental and Gilad Brand

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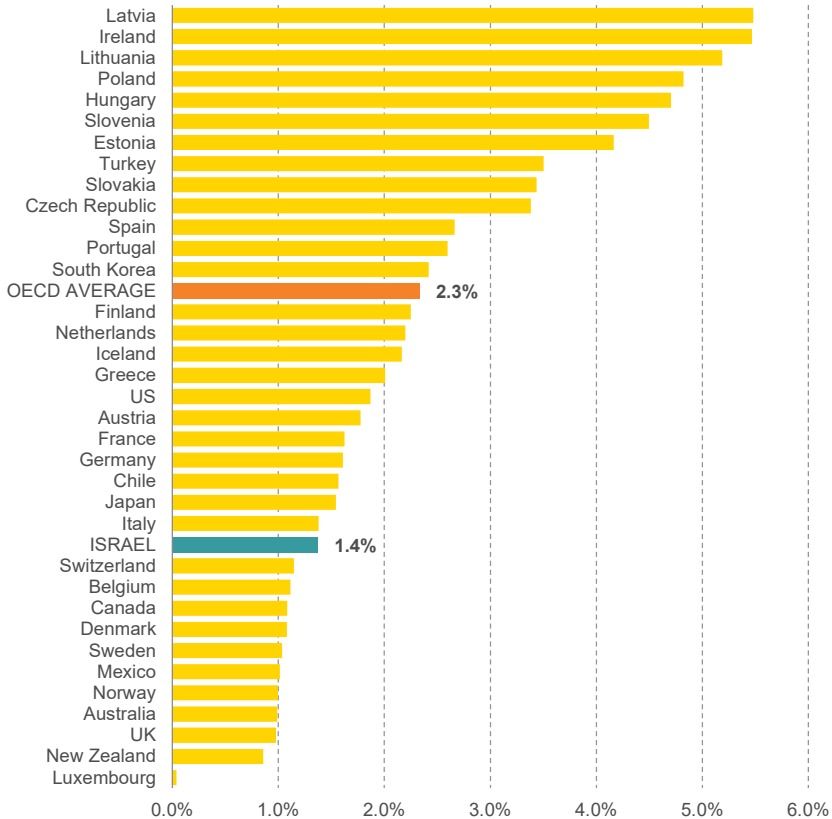
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1. Growth

In 2019, Israel's GDP is expected to grow by 3.1 percent, a somewhat lower rate than in previous years but nonetheless similar to the estimated potential for long-term economic growth. This is a high rate of growth relative to other countries, except that considering Israel's population growth rate of 2 percent per annum, which is also relatively high in international terms, Israel's growth rate of GDP per capita is only about 1.1 percent, which is low relative to other OECD countries. In recent years, GDP per capita in Israel has grown slowly relative to other countries and its growth rate is similar to that of countries with a relatively high level of income. Accordingly, the disparities in standard of living between Israel and more developed countries are not narrowing over time (Figure 1).

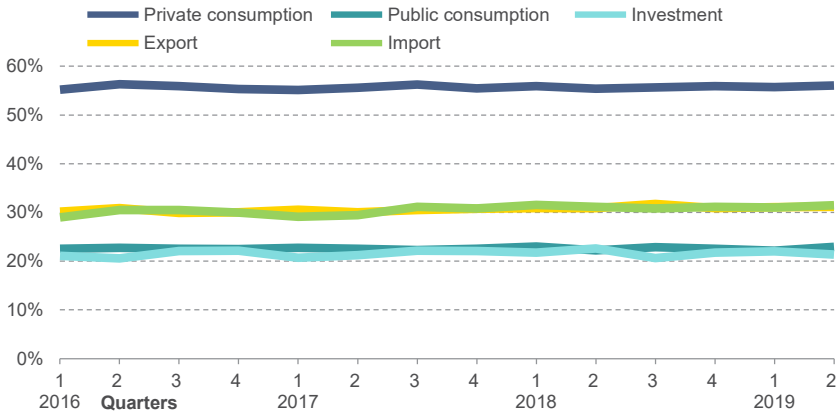
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Figure 1. Average annual per capita GDP growth, 2016-2018

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

The components of GDP

In recent years, the composition of GDP has been relatively stable, which is consistent with “balanced growth,” a widely accepted concept in economic theory. Investment and public consumption each constitute about 22.5 percent of GDP. Imports and exports are also roughly equal in size at 32 percent. Accordingly, private consumption is at a level of about 55 percent of GDP. In the first two quarters of 2019, there was somewhat of a rise in public consumption at the expense of investment, although it is too early to interpret this as a trend (see below).

Figure 2. GDP components

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: CBS

The labor market

The rates of employment and labor force participation have stabilized at high levels (78 percent and 80 percent, respectively), relative to the past and to other countries. The rate of unemployment is still at a historic low (3.3 percent), and the rate of job vacancies is also relatively high (3.5 percent as compared to an average of 2.9 percent over the past decade).¹ The real wage continues to rise at a healthy rate, primarily in the business sector – about 3.5 percent relative to the same period last year.² The data overall point to a tight labor market and it appears that the economy has reached full employment.

Fiscal policy

As in previous years, fiscal policy continues to be expansionary this year. According to reports by the Ministry of Finance, the deficit in 2018 was 2.9 percent of GDP, exactly as planned; however, it appears that the deficit in 2019 is expected to significantly exceed the target, which has again been set at 2.9 percent.³ At this stage, the Ministry of Finance is reporting a deficit of

1 In the main working age population (ages 25-64). The data relate to January-October 2019.

2 January to August 2019.

3 The exact match between the deficit target and the actual deficit in 2018 is subject to examination by the State Comptroller.

3.8 percent and, according to the estimates of the Bank of Israel, the deficit is expected to be 3.5 to 4 percent of GDP by the end of 2019 and will reach 4.5 percent by 2022.⁴ This trend is in contrast to what is recommended by accepted economic theory, namely that the government should adopt an anti-cyclical policy. In other words, during a period of growth, the government should use the increased tax revenue to increase national saving (i.e., reduce the budget deficit or even produce a surplus) in order to free up resources that will support an expansionary fiscal policy in a downturn, when tax revenues fall automatically. The aforementioned employment statistics indicate that the business cycle has been at its peak in recent years, and, therefore, the current policy, which is producing a major increase in the deficit and a halt in the downward trend of the debt-to-GDP ratio, cannot be justified.

Monetary policy and consumption prices

Annual inflation is still lower than the lower bound of the target set by the government (1 to 3 percent). The inflation rate in the past 12 months (October 2019 versus October 2018) stands at 0.4% and expectations are that inflation will remain lower than the target level also in the coming months. Global monetary policy has recently changed course, having returned to being expansionary following two years in which several leading economies gradually raised their interest rates. These developments led to a policy change at the Bank of Israel, whose projections are that the interest rate will remain at its current level for an extended period of time. The low rate of inflation is apparently also the result of an increase in domestic competition, which has led to a long-term process of adjustment in which the domestic price level is converging to the foreign price level. *Spotlight B* relates to the pass-through from foreign to domestic prices and presents an analysis indicating that it has become faster, apparently due to the increased level of competition in imports.

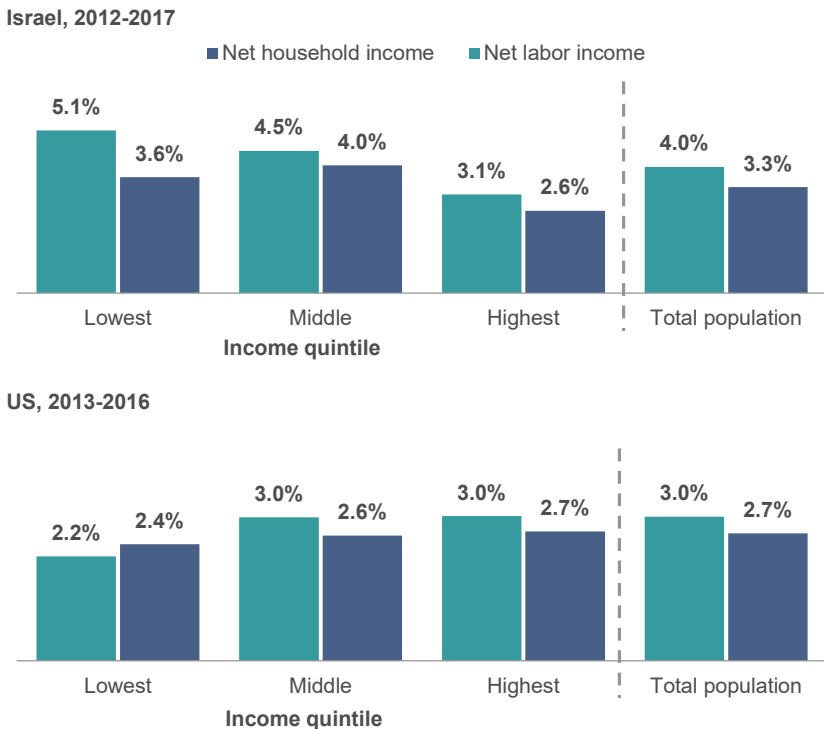
2. Household income and inequality

While growth per capita in Israel is more or less similar to that of more developed countries, such as the United Kingdom, the US, and Germany, the way in which growth trickles down to the population is significantly different. In many developed countries, growth is concentrated among households in the upper part of the income distribution, while in Israel

⁴ According to the Governor of the Bank of Israel at the government meeting on the budget and the revisions of the triennial forecast, <https://tinyurl.com/ryy9rd8>

there are signs of more rapid growth in the income of households in the middle and lower parts of the distribution. Figure 3 illustrates this trend and shows the average annual change in household income at the various levels of income in Israel and in three reference countries.⁵ It can be seen that, for example, the net income (i.e., after transfer payments and taxes) of Israeli households has increased relatively quickly in the middle and lower quintiles, by annual average rates of about 3.6 and 4.0 percent, respectively. In contrast, the net income of households in the upper quintile recorded a more moderate increase of about 2.6 percent. The figure shows that in the reference countries the improvement at the lowest income levels was more moderate than that at the higher levels of income.

Figure 3. Average annual change in real household income Israel and selected countries, in real terms

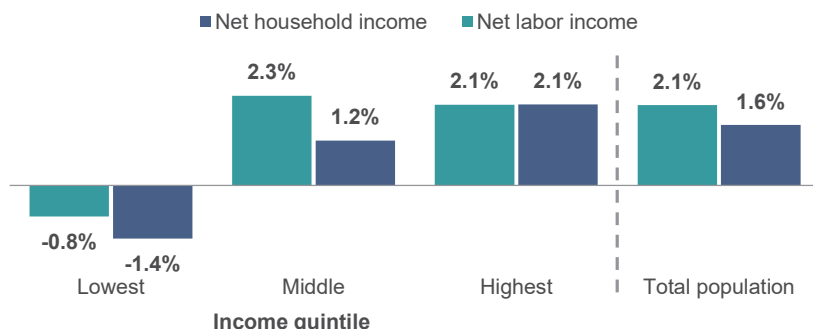


⁵ The reference countries in this figure were chosen on the basis of accessibility to comparable data in the LIS Survey.

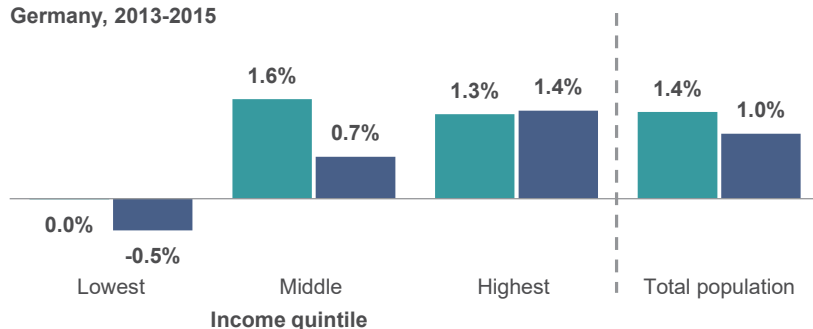
Figure 3 (continued). Average annual change in real household income

Selected countries and years

UK, 2013-2016



Germany, 2013-2015



Note: Due to data limitations, comparable years for the selected countries were not available.

Source: Benjamin Bentall and Gilad Brand, Taub Center | Data: LIS; CBS, *Household Expenditure Survey*

The explanation for these differences can be found in the factors driving the improvement in household income in Israel. A significant part of the improvement is the result of the rapid increase in labor income of the lower income deciles resulting from wage increases and employment levels. The growth in employment is based on the increased incentive to join the labor force, due to, among other things, the combination of a large increase in the minimum wage, on the one hand, and the high demand for labor, on the other.⁶

⁶ See the discussion in Bank of Israel (2018; Chapter 2).

This situation creates an opportunity to integrate additional populations into the labor market and to improve the skills of new participants in the labor force. The creation of tools such as practical vocational training will support continued integration into the labor force and the improvement of employment possibilities and in that way will contribute to eliminating economic disparities. These trends are less relevant to households in the higher income deciles whose employment rates are already high.

An examination of the changes from a long-term perspective illustrates the extent to which the narrowing of gaps is unique to Israel. Figure 4 presents the Gini coefficient of inequality over two decades and shows that there has been a consistent downward trend in income inequality in Israel. This trend is not seen in the reference countries and is first and foremost the result of the expansion of labor force participation during this period.⁷

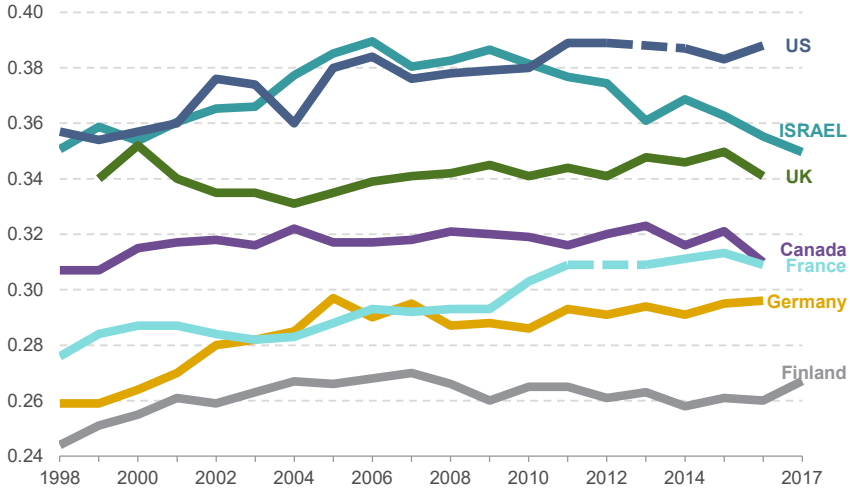
It remains to resolve the apparent contradiction between the rapid rise in household income in Israel relative to other countries and the only moderate rise in GDP per capita during this period. The explanation for this inconsistency is likely due to different trends that characterize consumption prices and output prices in Israel. Specifically, in recent years, consumption prices have fallen relative to output prices in Israel,⁸ which is the result of, among other things, reforms to encourage competition in the domestic market that were introduced following the 2011 social protests.⁹ *Spotlight B* relates to additional aspects of this trend.

7 See the discussion in Bank of Israel (2019a, pp. 180-187) and the National Insurance Institute (2018). According to the latter, the decline in inequality in recent years has been influenced by the increase in the Old Age Income Allowance supplements since 2015.

8 Bental and Brand (2018) show that the differences in the development of consumption prices relative to output prices resolve the contradiction between the large increase in wages and the only moderate rise in the cost of labor per unit of output.

9 Since 2014, there has been a slowdown in the rate of inflation in most of the developed countries. Bental and Brand (2018) show that the trend in Israel is an outlier when taking into account the healthy situation of the labor market. This performance is attributed to the reforms implemented in the years since the 2011 social protests.

Figure 4. Gini index for disposable income
After transfer payments and taxes, Israel and selected countries



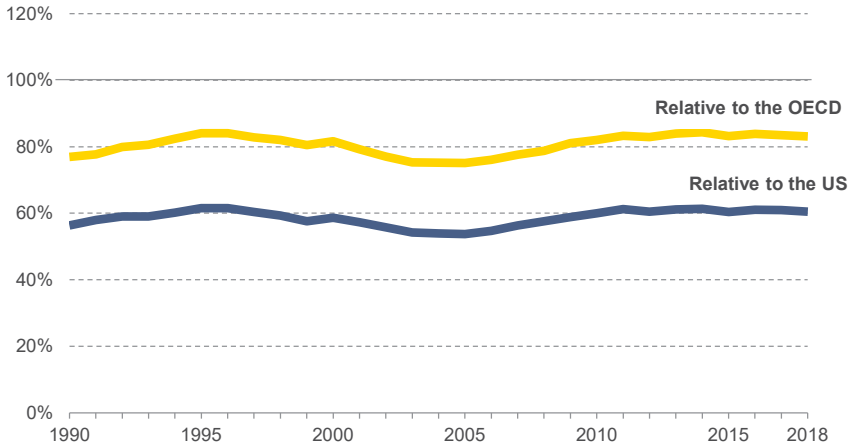
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

A long-term perspective

Production and economic growth

As shown in Figure 1, the growth in GDP per capita in Israel is slower than in the OECD countries on average. As mentioned, taking into account income levels in Israel relative to those in the OECD countries, it becomes clear that Israel's rate of growth is particularly low. In other words, for many years, the Israeli economy has not managed to narrow the gap in the standard of living relative to other countries. Figure 5, which is based on World Bank data, shows that, for more than a quarter of a century, GDP per capita in Israel has been constant at 60 percent of GDP per capita in the US. Also relative to the OECD countries, there has been no significant change over time.

Figure 5. GDP per capita in Israel relative to the US and the OECD countries, PPP adjusted



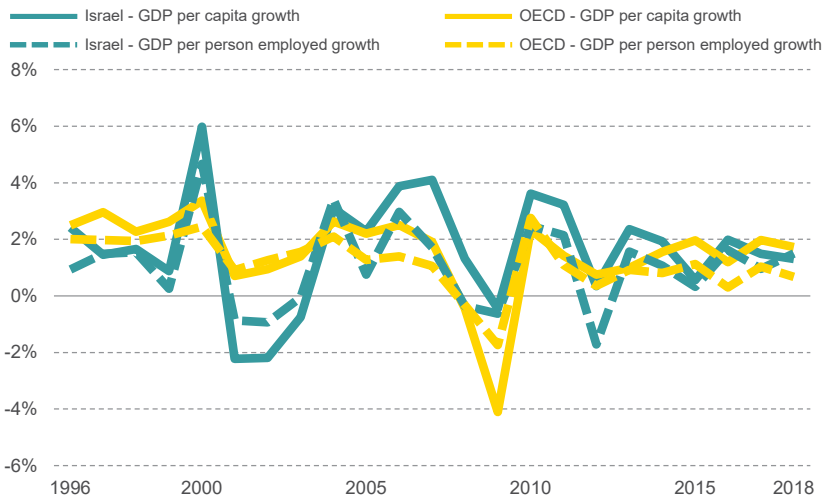
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: World Bank

An international comparison of GDP per capita and growth rate is a widely accepted practice, but caution is warranted when using these indices to compare labor productivity in Israel to other countries, primarily because the population in Israel is relatively young and growing at a faster rate than in most of the reference countries. This fact on its own is likely to lead to a misleading conclusion, since the addition of young cohorts increases the number of individuals in the economy at a faster rate than in other countries. Evidence of this can be seen to a certain extent in Figure 6. The figure presents the rate of growth in GDP per capita and of GDP per person employed in Israel and in the OECD countries and shows that the rate of growth in GDP per capita in both Israel and the OECD has for some time been higher than the rate of growth in GDP per person employed. Thus, the rate of growth in the labor force is larger than the rate of growth in the population. Nonetheless, in the OECD countries the gap is widening, and particularly in recent years it has been larger than the corresponding gap in Israel. Thus, it would appear that the advantage of the OECD countries in the rate of growth in GDP per capita in recent years reflects a slower rate of population growth in these countries relative to the rate of growth in Israel. In order to control for this difference and to strengthen the conclusions regarding labor

productivity in Israel and its rate of growth, the focus will be on comparative data on GDP per person employed in the following discussion.¹⁰

Figure 6. GDP per capita and GDP per person employed growth rate

Israel and the OECD average

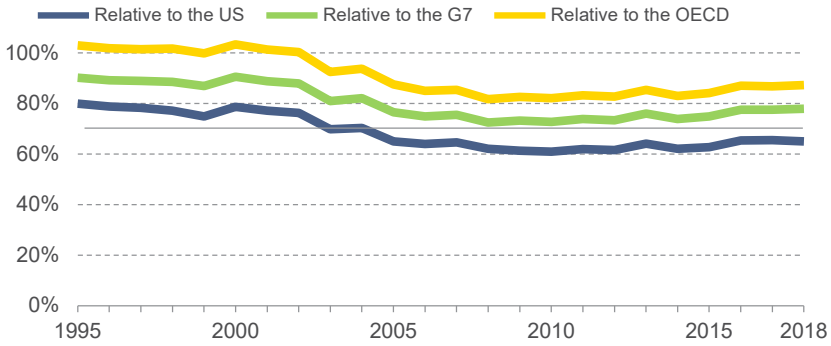


Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD, Stat

Figure 7 presents the level of GDP per person employed in Israel over time relative to that in the US, the G7 countries, and the OECD. The measure indicates a continuous decline that became more severe in 2003 resulting from the entry of unskilled workers into the labor market, followed by some recovery in the last decade. For example, relative to the US, Israel's index stood at 80 percent in 1995 and declined to 61 percent in 2010, and since then has recovered by about only 4 percentage points.

¹⁰ In the *State of the Nation Report 2018*, the focus was on GDP per work hour. The main conclusions point to the same trends.

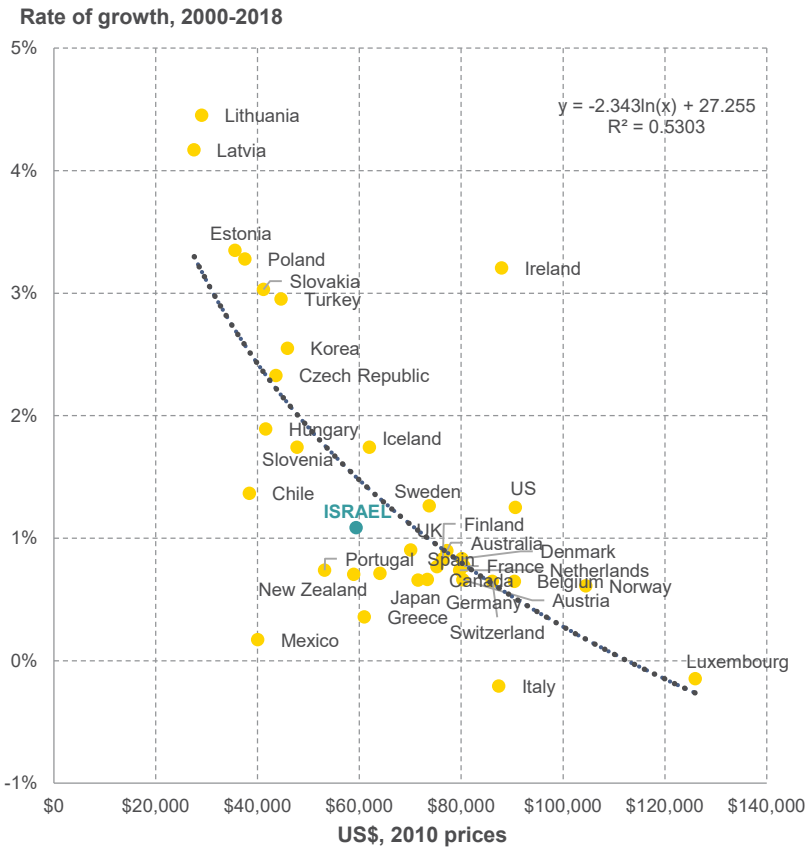
Figure 7. GDP per person employed relative to their peers in other country groupings, PPP adjusted



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD. Stat

In order to shed light on the processes that explain these findings, Figure 8 presents the average annual rate of growth in GDP per person employed in the OECD countries since 2000 (the vertical axis) relative to the level of GDP per person employed in 2000 (in 2010 dollars, adjusted for purchasing power).

Figure 8. Conditional convergence, relationship between GDP per person employed in 2000 and its rate of growth 2000-2018 OECD countries, PPP adjusted



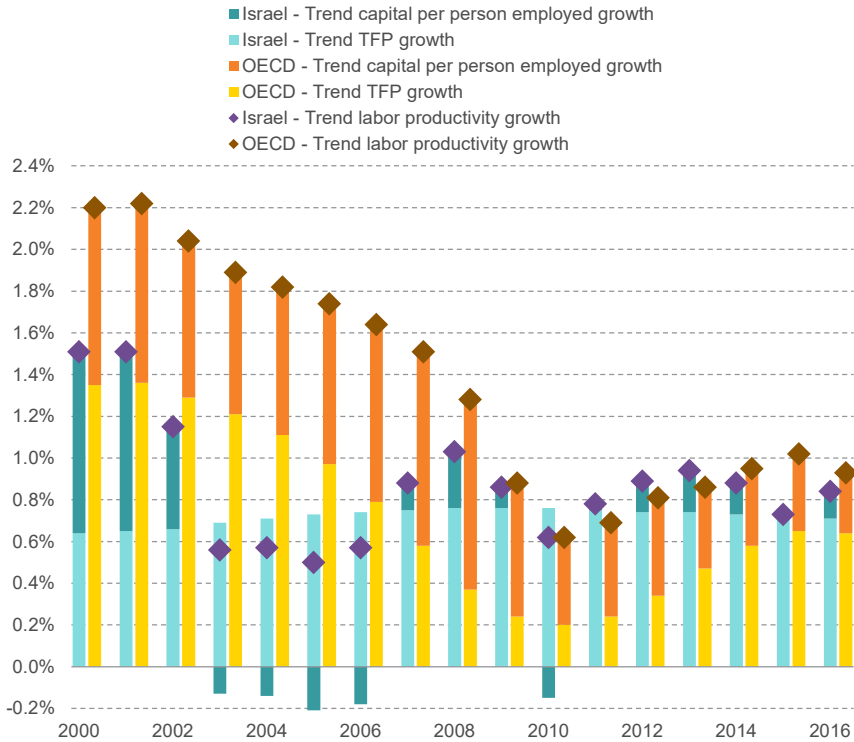
Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

The trend line summarizing the points on the figure indicates a negative relationship between GDP per person employed at the starting point and the rate of growth in GDP per person employed. This phenomenon is consistent with the law of diminishing marginal productivity and Solow's growth model, according to which it is "easy" for countries in the midst of a development process to grow rapidly, while this is more difficult for countries that are already at high levels of GDP. Therefore, it is not

surprising to find that most of the former Soviet bloc countries had lower GDP per person employed than Israel in 2000, but that their rates of growth of GDP per person employed were very high. Chile and Mexico are “veteran” market economies, which also had lower GDP per person employed than Israel’s, but their rates of growth in GDP per person employed are lower than expected according to the trend line. The history and market conditions of these Latin American countries differ from those of most of the other OECD members and, in general, they are not countries that are included among Israel’s reference countries. Greece and Portugal, in which GDP per person employed was similar to Israel’s, were more seriously affected by the 2008 crisis and their process of recovery was particularly drawn out. The level of GDP per person employed in New Zealand was similar to Israel’s and did not increase at a reasonable pace, as opposed to Iceland in which growth was faster than expected. According to the trend line, the expected growth in GDP per person employed in Israel was 1.5 percent, while the actual rate was only 1.1 percent. If the faster growth rate had been achieved, GDP per person employed would have reached about \$80,000 in 2018 (as opposed to \$74,000 in actuality), a level close to that of the UK and Germany (whose GDP per person employed also grew at a slower rate than expected according to the trend line).

Figure 9 illustrates one of the reasons for the low rate of growth in GDP per person employed in Israel. It presents the rate of change in the ratio of potential GDP to potential worker. This rate of change is attributed to two factors: the rate of change in capital per person employed and in total factor productivity (TFP). Accordingly, the additional production of the “average worker” can be the result of increasing the amount of capital utilized or an increase in work efficiency (for example, due to an improvement in management, the lowering of market barriers, etc.). As can be seen, in most of the years surveyed, the rate of potential growth of output per person employed in Israel is lower than the OECD average. This fact is first and foremost the result of the difference in the contribution of capital to the potential growth of output per person employed, where this contribution to the OECD average is significantly higher than in Israel. Moreover, in some of the years the contribution of the growth in capital in Israel was even negative and, as a result, the rate of growth in output per person employed was even lower than the rate of growth in TFP.

Figure 9. Rate of annual growth in worker productivity
Israel and the OECD countries



Note: The OECD refers to a “trend variable” when it considers its value net of business cycle fluctuations (i.e., Hodrick-Prescott detrended).

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD

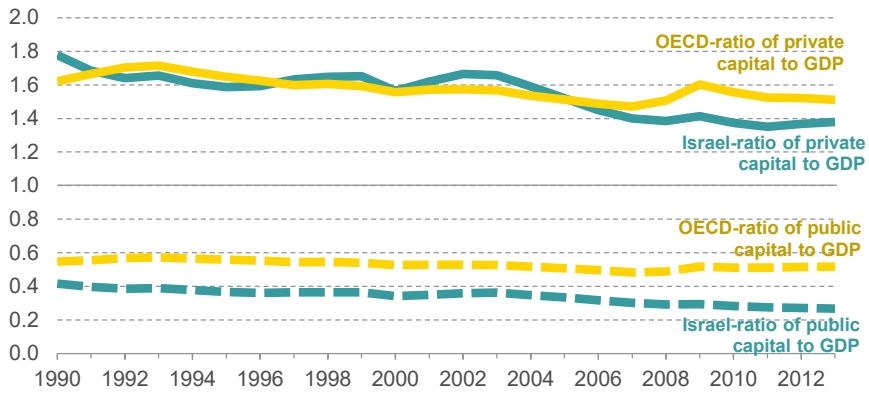
The low growth in capital per person employed shown in Figure 9 is also expressed in the level of the capital stock in the economy. According to IMF data, about fifty years ago, private capital in Israel relative to GDP was about 50 percent higher than the OECD average.¹¹ This situation has been reversed and, as can be seen in Figure 10, the ratio became approximately equal to that of the OECD countries in the 1990s and recently has even

¹¹ Source: IMF: Investment and Capital Stock Dataset, 1960-2013.

fallen to about 90 percent relative to the reference countries. About fifty years ago, public capital (including mainly transportation, education, and health infrastructure) relative to GDP was almost equal in size to that in the reference countries (not presented in the figure), but it eroded continuously over the years. In the 1990s, the ratio was lower by one-third than that of the reference countries and it has continued to decline to about one-half (26 percent as opposed 52 percent relative to GDP in 2013).

Figure 10. Ratio of private and public capital to GDP

Israel and the OECD countries



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: IMF

Widely used calculations in economics show that these data are sufficient to explain a substantial proportion of the differences in labor productivity between Israel and the reference countries. These calculations are based on an aggregate Cobb-Douglas production function and on an elasticity of output with respect to labor of 0.7. They attribute about 4 percentage points of the output gap to the low level of private capital in Israel. Public capital is complementary to private capital and is identified as having a significant effect on productivity. The economic literature estimates the elasticity of output with respect to public capital to be 0.16 on average.¹² This implies that, due to the low level of public capital relative to GDP in Israel, which is about one-half of the OECD average, there is a loss of an additional 16 percentage

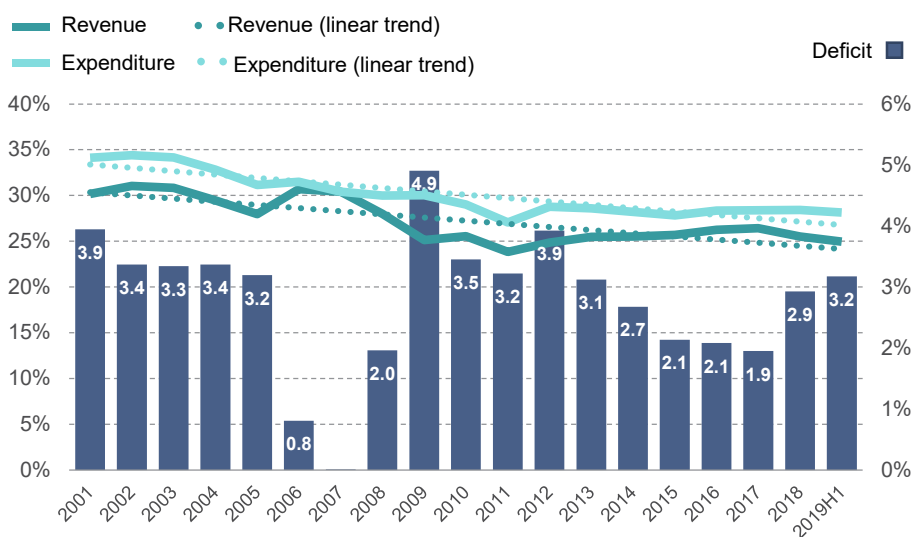
¹² The figure is taken from a meta-study that reviews 145 relevant studies. See Núñez-Serrano and Velázquez (2017).

points of output per person employed relative to the reference countries. These two figures are sufficient to explain a substantial proportion of the gap of roughly 20 percentage points in productivity per person employed between Israel and the reference countries indicated in Figure 7.

The budget and the deficit

Figure 11 shows the paths of the government's expenditure and revenue and the resulting deficit over close to two decades. The figure is based on annual data for government expenditure and revenue and on calculations of annual GDP in current prices.¹³

Figure 11. Revenue, expenditure, and deficit relative to GDP



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Ministry of Finance; CBS

13 The budget figures are taken from the Ministry of Finance, <https://mof.gov.il/AG/BudgetExecution>. GDP in current prices is taken from the Central Bureau of Statistics. The estimated deficits relative to GDP reported in Figure 11 are the ratios between the accumulated deficit and the GDP for each respective period. This method results in lower deficit estimates than those reported by the Treasury for 2019H1. *Spotlight A* in this chapter explains the Treasury's method.

The figure shows the continuous and consistent decline in defense expenditure at a rate of 0.2 percentage points of GDP per year down to its recent level of about 5 percent of GDP. In contrast, civilian expenditure is characterized by a lack of stability. Following the prolonged decline in the 2000s, the trend changed and the expenditure of the government ministries returned to the level of close to 20 percent that prevailed in 2000; however, recently the upward trend has been halted. As a result of the budget cuts that will be necessary due to the growing size of the deficit, on the one hand, and the intention to raise defense expenditure to 6 percent of GDP, on the other hand, there is concern that the government's civilian expenditure will be reduced significantly in coming years unless taxes are increased instead.

As can be seen from the trend lines, the ratio of expenditure to GDP has fallen by about 0.37 percentage points per year, while the parallel ratio for revenue is declining at a somewhat slower rate of about 0.34 percentage points per year. According to the trend lines, the deficit relative to GDP was meant to decline during this period by about 0.5 percentage points to about 2.5 percent of GDP. As noted previously, the deficit target for 2018 and 2019 is 2.9 percent and in actuality the deficit is significantly higher.

Figure 12 presents the division of the budget between the civilian ministries and defense in terms of percent of GDP.

Figure 12. Civilian and defense expenditure as a percent of GDP



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Ministry of Finance

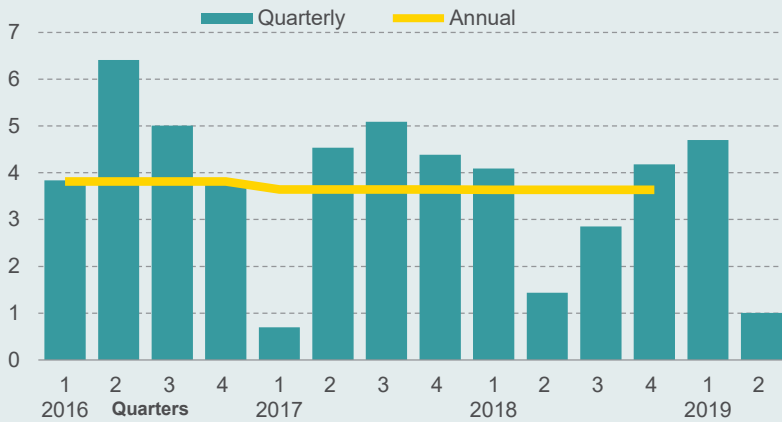
The figure indicates that the change in trend is primarily the result of the fall in revenue in 2018, which appears to have continued during the first half of 2019. In this context, 2017 appears to be an outlier, in which the deficit was less than the target of 2.9 percent. This outcome was the result of particularly high tax revenue in that year, due to one-time tax events (the sale of Mobilye and the stock issue for Tamar Petroleum) and the incentive for tax payments on the distribution of dividends. According to Bank of Israel estimates, without these one-time events, government revenue would have been lower by 1.3 percent of GDP and, accordingly, the deficit would have been 3.2 percent.

Spotlight A

Periodic data and their significance

The Central Bureau of Statistics (CBS) publishes quarterly figures on economic growth (in annual terms), which are calculated according to data gathered during the previous quarter. Spotlight A Figure 1 presents the quarterly growth rates and the annual cumulative rates for the previous three years. The high volatility in the quarterly rates makes it difficult to draw conclusions based on them, even for the current year.

Spotlight A Figure 1. GDP growth in annual and quarterly rates



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Ministry of Finance

In order to further illustrate the difficulty in interpreting quarterly data, we will focus on the first and second quarters of 2019, which have also drawn public attention. In its initial announcement, the CBS estimated the annual rate of economic growth to be 5 percent in the first

quarter, which was later revised to 4.7 percent. With time, it became clear that this high rate was the result of advance vehicle imports due to a scheduled tax hike on “green vehicles.” As a result of these vehicles being brought in earlier, the total import of vehicles in this quarter was unusually high, but so was the consumption of vehicles. These two factors should have offset each other in the National Accounts, since vehicles are not produced in Israel. However, since output is measured in market prices, the value of the consumption of vehicles, including taxes, is higher than their import value. The result was rapid measured economic growth in this quarter, which essentially did not reflect an increase in the productive activity of the economy.¹⁴ In contrast, during the second quarter there were no outlying events of this type and accordingly the rate of growth was only 1 percent in annual terms (which translates into negative growth in per capita terms, since the population grows by about 2 percent annually).

These quarterly data are used by the Ministry of Finance in calculating the budget deficit in terms of percent of GDP. It even publishes monthly data on the cumulative deficit over the previous 12 months relative to GDP. Thus, for example, it is estimated that the cumulative deficit for September 2019 over the 12 months starting in October 2018 constituted 3.8 percent of GDP (as compared to a deficit target of 2.9 percent for 2019).¹⁵ In January, February, and March of 2019, the estimates stood at 3.3 percent, 3.5 percent, and 3.4 percent, respectively, and rose to the current estimate only in April 2019. It appears, therefore, that, also in this case, caution must be exercised in interpreting findings based on high-frequency published data.

14 If output were measured in terms of factor of production prices thereby reflecting value added in the economy, then the advance vehicle imports would not have had any effect on output.

15 The actual deficit during this period was 3.3 percent. The discrepancy is the result of a technical deferment of tax payments from September to October 2018 due to the Jewish High Holidays. See <https://tinyurl.com/y2dso8td>

Spotlight B

The pass-through rate from foreign to domestic prices

- Up until 2015, prices in Israel increased relatively quickly in response to price increases abroad, while their response to price decreases was quite slow. This asymmetry was somewhat greater than that found in other countries.
- Starting from 2015-2016, this asymmetry began to dissipate. Currently, domestic prices respond relatively rapidly to foreign prices and there is no evidence of asymmetry.
- The level of prices in Israel is still high relative to other countries (taking into account income per capita). Yet this result is also partly due to the strengthening of the shekel.

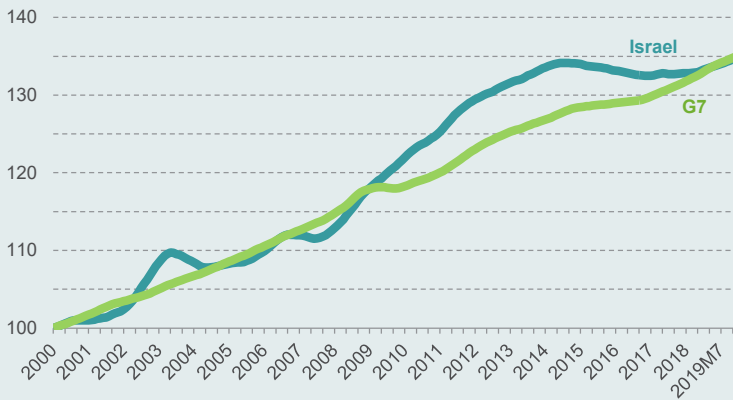
In recent years, there has been a slowdown in the rate of increase of consumer prices in Israel. While the slowdown in inflation characterizes many developed countries, Bental and Brand (2018) show that it has been more pronounced in Israel in view of the tight labor market and in particular the rapid rise in nominal wages in recent years. Spotlight B Figure 1 illustrates this by means of a comparison between the trend in prices in Israel relative to the G7 countries. The figure indicates that, since 2014, consumption prices in Israel have fallen at a cumulative rate of about 5 percent relative to these countries, a trend that points to a process of adjustment of consumption prices in Israel to the prevailing level abroad.

In this *Spotlight*, the focus is on this trend from a different perspective, namely the way in which changes in prices abroad affect domestic prices (i.e., the pass-through mechanism). The analysis shows that, until about 2015, there was clear asymmetry between the response of domestic prices to changes in foreign prices. During this period, an increase in foreign prices led to a relatively rapid increase in domestic prices while a fall in foreign prices led to a slow response.

Such asymmetry characterizes many developed countries, but it was particularly strong in Israel and especially between 2009 and 2014. In recent years, the situation has changed radically and it would appear that the asymmetry has disappeared. The estimation shows that domestic prices currently respond quite rapidly to changes in foreign prices and there is no evidence of asymmetry.

Spotlight B Figure 1. CPI in Israel and G7 countries

Index period: Q1-2000 = 100, annual moving average



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

The pass-through between consumer prices in different countries is generally examined by way of the exchange rate.¹⁶ In view of the difficulty in analyzing changes in pass-through by way of the exchange rate for short periods of time, we make use of a different method in which we isolate (exogenous) shocks in the global price level and examine the length of time during which they affect the domestic price level, while differentiating between negative and positive price

¹⁶ Bank of Israel (2019b) looks at the pass-through from the exchange rate to domestic prices using a rolling window and arrives at findings that are in accordance with the ones presented here.

shocks.¹⁷ The results are shown in Spotlight B Figure 2 by means of an impulse response function, which shows the cumulative effect of changes in foreign prices on the local price level between 2009 and 2015. The figure indicates that an increase of 1 percent in foreign prices led to a permanent increase of 0.4 percent in domestic prices over a period of 20 to 30 months.¹⁸ In contrast, a negative shock was not found to have a statistically significant effect. Similar though somewhat weaker results were found for the period 2000 to 2007 (2008 was omitted from the estimation period).¹⁹ A standard statistical test indicates a break in 2015–2016. The short time that has passed since then makes it difficult to estimate the magnitude of the change.

17 As in the literature that developed following Stock and Watson (2006), we adopt the assumption that inflation is composed of an unobservable slow moving trend component that follows a random walk process, and a stationary cyclical component. The trend component represents long-term adjustments in the rate of inflation and therefore we focus on it as a proxy for a permanent shock to the price level. In order to identify the trend component and the cyclical component, we estimate an Unobserved Components with Stochastic Volatility (UCSV) state space model (for details, see Forbes, 2018). The model is estimated separately for 27 OECD countries (excluding Japan, Chile, Latvia, Luxembourg, Mexico, Iceland, Australia, and New Zealand) from 2000 to the first quarter of 2019. We make use of the first principal component of the changes in the trend component in these 27 countries as an approximation of the co-movements in global prices. In order to distinguish between demand and supply shocks, we use a method presented by Sussman and Zohar (2018) that was recently applied by Alquist, Bhattarai, and Coibion (2019). In that framework, we use the first principal component of the changes in 29 commodity prices traded in the global market as an instrument for changes in global demand. In the next stage, we run a regression in which the first principal component of the trend component in inflation is explained by the first principal component in the prices of commodities and relate to the residual from this equation as an approximation of exogenous supply shocks. In the final stage, we estimate response functions using the local projections method (Jordà, 2005). These estimations indicate a structural break during 2008 and another around 2015.

18 The literature points to an exchange rate pass-through rate of about 0.25. The method used here, which does not relate to exchange rates, indicates a higher pass-through rate of about 0.4. A similar pass-through estimate was found in other small and open economies (such as Sweden, Denmark, and Switzerland). Applying this method to the price index of tradable goods indicates the pass-through rate of close to unitary.

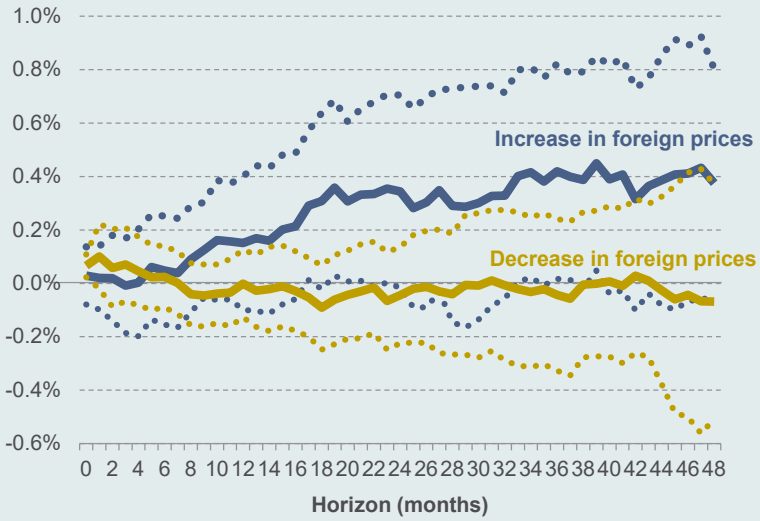
19 The year 2008 was omitted because the volatility in inflation that year makes it difficult to draw conclusions about the pass-through rate.

Therefore, we make use of a different methodology in which we assume that between developed countries there is a component (that is unobservable) within the price level that follows an error correction process.²⁰ The implication of this process is that there are differences in price level between countries, but that the gaps tend to remain in the vicinity of a constant ratio.²¹ Therefore, a deviation of the price level from equilibrium between countries leads to an error correction process in which prices return to their fixed level over time. This estimation reveals that between 2009 and 2015, it took about 13 months for half of the price gaps to dissipate (Spotlight B Figure 3). In other words, price gaps returned to their original level only after an extended period. In contrast, when there was a deviation in the other direction and foreign prices rose, the resulting price gaps were only temporary and quickly vanished. About half of the deviation dissipated during a period of about two weeks. The findings indicate a shift in the pass-through rate in recent years. As can be seen in Spotlight B Figure 3, since 2016, there has been a close connection between the price level in Israel and that in other developed countries, such that changes in foreign prices are quickly reflected in domestic prices, in the case of both price increases and price decreases. In other words, the lack of symmetry that was found has disappeared in recent years. This result is consistent with other findings that indicate increased competition in the economy (Bank of Israel 2018; 2019a).

20 Using the bounds test of Pesaran, Shin, and Smith (2001), we find that the trend component tends to converge between countries while the inflation series can diverge from one another over a relatively extended period. The bounds test makes it possible to test for the existence of an error correction regardless to the levels of integration. The bounds test is most useful to this application since notwithstanding the assumption that the trend component follows a random walk process, in practice unit root test are inconclusive regarding its level of integration.

21 In accordance with the “law of one price” in its weak form, the real exchange rate will fluctuate around a long-term average. Fast growing countries will tend to deviate from this rule (according to the hypothesis of Balassa and Samuelson, 1964).

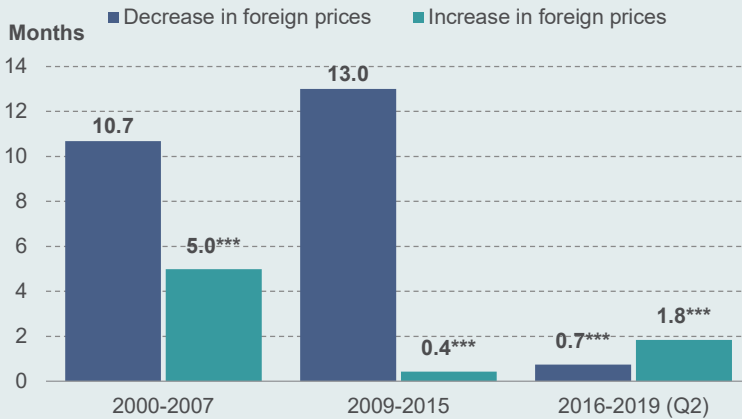
Spotlight B Figure 2. The cumulative effect of a 1-percent exogenous price shock on domestic prices, 2009-2015



Note: The broken lines represent 95 percent confidence intervals.

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Bank of International Settlements

Spotlight B Figure 3. Length of half-life of local price deviation relative to foreign prices



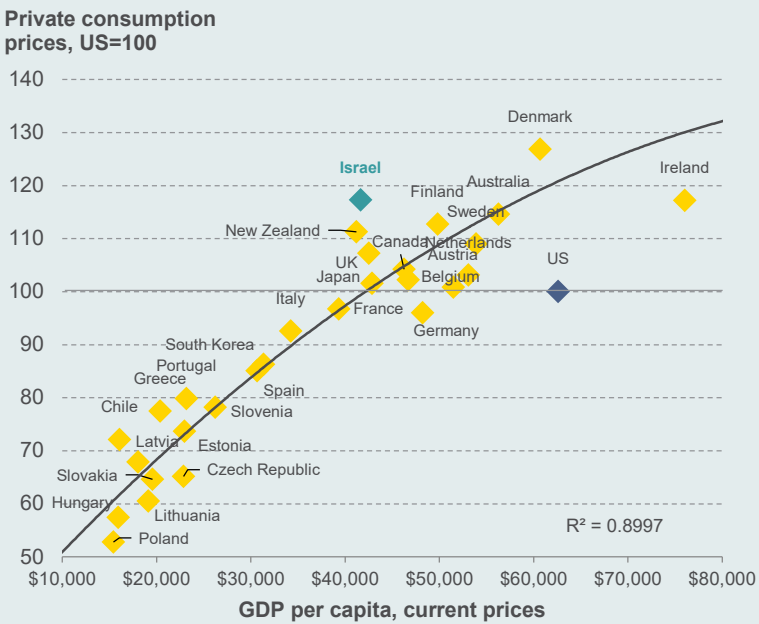
Note: *** Significance level of 1%.

Source: Benjamin Bental and Gilad Brand, Taub Center | Data: Bank of International Settlements

Notwithstanding the positive developments in recent years, an examination of price levels relative to other developed countries shows that prices in Israel are still high when taking into account that income per capita in Israel is relatively low (Spotlight B Figure 4). Essentially, a comparison of price levels in the developed countries reveals that Israel is to a large extent an exception with regard to the connection between price level and income per capita. This deviation is about 17 percent, which is the highest among the developed countries. In other words, prices in Israel are higher by about 17 percent than the level expected in a country with its level of income per capita. Since the analysis of price gaps between countries is essentially a comparison of the real exchange rate, it is difficult to determine to what extent this result reflects the strengthening of the shekel during this period. A comparison over a number of years

points to a narrower gap — of about 12 percent — which is found to be statistically significant. In other words, notwithstanding the positive developments in recent years, it can be concluded that price levels in Israel are still relatively high. Additional policy measures, like those adopted in recent years, will help narrow these gaps.

Spotlight B Figure 4. Price levels and income per capita in OECD countries, 2018



Source: Benjamin Bental and Gilad Brand, Taub Center | Data: OECD.Stat

Conclusion

The economy is characterized by relatively stable growth and a tight labor market, a trend that has continued for several years. Output is growing at a rate similar to the potential growth of the economy (about 3 percent), a relatively slow rate considering that the population is growing at a rate of 2 percent. This does not make it possible to narrow the gap in the standard of living between Israel and other developed countries. The fiscal system is under increasing pressure. The budget deficit is currently running at about 4 percent of GDP, and thus the previously downward trend in the debt-to-GDP ratio that characterized the economy for many years has been reversed. If steps are not taken to reduce government expenditure and/or increase revenues, the deficit can be expected to grow in coming months. An increase in the deficit at this time contradicts accepted economic theory, which holds that in a period of growth resources should be accumulated that will support expansionary policy during periods of slowdown. On the positive side, it is worth mentioning that there is growing evidence of increasing domestic competition in Israel and a process of price adjustment to a level similar to that in other developed countries.

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