Chapter 2

Aggregate Activity: GDP and Employment

- The GDP growth rate (3.3. percent) was similar to that in 2012, and per capita GDP increased by 1.4 percent, including the positive contribution of natural gas production from the Tamar reservoir which began this year.
- The low rate of growth in world trade and the cumulative appreciation of the exchange rate in recent years led to a small decline in exports this year.
- The government took steps to reduce the deficit since its structural component has increased in recent years. These measures contributed somewhat to a slowdown in growth.
- The Monetary Committee responded to recessionary factors by reducing the interest rate and purchasing foreign currency, which supported domestic demand and moderated the appreciation of the exchange rate.
- Israel's per capita GDP has increased by a faster rate than the OECD average since 2008, and as a result Israel has narrowed the gap with the OECD from 20 percent in 2007 to 14 percent this year.
- The real appreciation has reduced the export surplus in recent years and has acted to moderate Israel's advantage over advanced economies with respect to the rate of growth.
- The number of employees in the manufacturing industry remained unchanged and grew only moderately in the other industries. The number of employees in public services continued to grow at a stable rate and as a result the rate of unemployment continued to decline.
- The weak demand in the economy was manifested in lower utilization of factors of production and a decline in the unit labor cost. This is consistent with the widening of the output gap to some extent during the last two years.
- The industries that sell in the domestic market lag behind the average for those same industries in the OECD with respect to human capital and innovation, as well as labor productivity.
- As a result of the adoption of a new methodology for calculating the National Accounts, investment in R&D in the amount of about 2 percent of GDP was recorded as GDP. This is less than the total expenditure on R&D in Israel, which is 4.5 percent of GDP, with the remainder accounted for by the export of R&D services, which is already included in GDP.

1. MAIN DEVELOPMENTS AND BACKGROUND CONDITIONS

a. Main developments

The GDP growth rate (3.3 percent) was similar to that in 2012. Excluding the effect of natural gas production, the growth rate slowed to 2.5 percent, particularly due to the continuing global economic crisis.

The GDP growth rate (3.3 percent) was similar to that in 2012, despite the positive contribution of the production of natural gas from the Tamar reservoir, which began this year. Excluding the effect of the beginning of natural gas production, the growth rate slowed to 2.5 percent. The slow rate of growth in world trade continued to restrain the rate of growth in exports. Exports even declined somewhat this year, which was apparently also due to the cumulative effect of the real appreciation. This follows several years in which exports grew faster than world trade. In addition to the stagnation in exports, the steps taken by the government to reduce the deficit, whose structural component has reached high levels in recent years, also restrained growth this year. In view of the continued stagnation in foreign demand, the real appreciation and the deficit reduction policy, the Bank of Israel acted to stabilize the rate of growth. Thus, the Monetary Committee continued its expansionary monetary policy by reducing the interest rate and purchasing foreign currency, which acted to support domestic demand and moderated the appreciation and its negative effect on the export surplus.

Weak foreign demand and the level of the real exchange rate also affected the labor market, with stronger demand for labor in the nontradable industries. Thus, the number of employees in the manufacturing industry remained unchanged while in other industries it grew at a moderate though stable rate. This is because domestic demand continued to expand and employment in the public sector grew. This contributed to the decline in the economy's unemployment rate, which is currently at a record low.[1] In addition to the cyclical factors and the policies that contributed to this outcome, there are also a number of contributing structural factors (see Chapter 5). Although the unemployment rate is low, factors of production are not at full employment and during the last two years a small and negative output gap has developed. Two developments are evidence of this: the decreased utilization of factors of production (the number of work hours per employee and the utilization of equipment and machinery) and the halt in the growth of the real wage.

Per capita GDP in Israel has increased in recent years at a faster rate than the average in the OECD countries. Israel's growth advantage is based on factors leading to a real appreciation, which in turn has led to a reduction in the export surplus and somewhat slower growth.

Per capita GDP has grown in the last two years at an average rate of 1.5 percent, which is lower than the rates for 2010 and 2011 and the long-term average for recent decades (1.8 percent). Nonetheless, it is higher than the OECD average. Per capita GDP in Israel has increased in recent years at a faster rate than in the OECD countries and Israel has narrowed the gap with the OECD from 20 percent in 2007 to 14 percent this year. It is still too early to determine the extent to which this has been the result of temporary cyclical factors and the extent to which it is the result of long-term factors. However, it is reasonable to assume that this improvement is in part only temporary since Israel's growth advantage was among the factors of a real appreciation, which in turn has led to the reduction in the export surplus and somewhat slower growth.

[1] The Central Bureau of Statistics recently made changes in its Labor Force Survey, which make it difficult to compare the rates of unemployment before and after the changes.

Table 2.1

Indicators of economic activity, 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
GDP	4.0	1.2	5.7	4.6	3.4	3.3
GDP of OECD countries	2.6	-3.6	3.0	2.0	1.5	1.0
Per capita GDP in Israel	1.8	-0.5	3.7	2.7	1.5	1.4
Per capita GDP in OECD countries	1.9	-4.2	2.4	1.4	0.9	0.3
Exports excluding diamonds and start-ups	8.5	-10.2	13.3	6.6	4.1	-1.2
Domestic uses	4.2	2.2	5.0	3.8	3.2	3.7
Unemployment rate (%)	10.7	9.5	8.4	7.1	6.9	6.2
Real wage per employee post	1.1	-2.6	0.7	0.4	0.5	0.8
Surplus in the current account (percent of GDP)	-0.1	3.8	3.1	1.3	0.3	2.4
Real effective exchange rate	[1]0.8	1.8	-5.1	-1.0	4.5	-6.4

[a] The figure relates to the years 1999–2008.

SOURCE: Based on Central Bureau of Statistics and OECD.Stat.

The two boxes below further discuss the developments in long-term factors. Box 2.1 discusses the possibility of permanently narrowing the gaps in per capita GDP and labor productivity by improving human capital and reducing the lag in innovation in nontradable industries in Israel. Box 2.2 deals with the new National Accounting methodology. As a result of adopting this methodology, investment in R&D, amounting to about 2 percent of GDP, was recorded as GDP. The expenditure on R&D in Israel is high relative to other countries and this contributes to the growth in productivity, particularly in the tradable industries.

b. Background conditions

The negative global environment was reflected in an additional slowdown in the global rate of growth from 3.2 percent in 2012 to 2.9 percent this year (see the breakdown by trading blocs in Table 2.2) and this restrained the rate of growth in Israel again this year. Growth in the EU, which is the destination for 25 percent of Israel's exports, was negative even though there was somewhat of a recovery during the course of the year. The recovery in the US, which is the destination for 30 percent of Israel's exports, was slower than expected and during the course of the year was negatively affected by the political standoff over fiscal policy (the "fiscal cliff") and the lack of certainty as to when the tapering of the quantitative easing would take place (it finally began only in early 2014). Japan's growth rate remained unchanged in 2013, while exports grew significantly as a result of the sharp depreciation of the currency, which compensated for the slow growth in domestic demand. The growth rate in the emerging markets,

The negative global environment was reflected in an additional slowdown in the global rate of growth, and world trade continued to grow at a low and stable rate.

and in particular India and China, continued to be moderate relative to the average during the decade prior to the 2008 crisis.

World trade and the imports of advanced economies grew this year at a low and stable rate. The share of trade in global output has remained unchanged in recent years, in contrast to its continuous uptrend prior to 2008. Until that year, many countries had been removing barriers to trade; however, since 2008 some of these countries have imposed new restrictions in response to the global crisis, in an attempt to support domestic production.

The real exchange rate appreciated in recent years, both in Israel and in other countries that were not overly affected by the crisis.

An analysis of Israel's real exchange rate from the perspective of the business cycle and in comparison to other countries shows an appreciation of 15 percent during the last two years relative to the two years preceding the crisis (Figure 2.1). The graph shows that the real exchange rate appreciated to one degree or another in countries that were not overly affected by the crisis, while those that were most affected, such as the US and the EU, experienced depreciation. Israel was not majorly affected by the crisis since its economic growth was supported by the stability of the financial system, while countries whose financial system was affected experienced an economic slowdown.

The start of natural gas production from the Tamar reservoir contributed to the growth rate and to the current account surplus. The natural gas discoveries act to cause appreciation that may negatively impact other areas of economic activity. The Bank of Israel acted during the year to moderate this effect, and the government is planning to do so in the future.

The start of natural gas production from the Tamar reservoir contributed somewhat less than one percentage point to growth this year, primarily due to the fact that it replaced more expensive diesel fuel and fuel oil, which the economy was forced to

Table 2.2
Global economic developments, 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
Advanced economies						
GDP	2.6	-3.6	3.0	2.0	1.5	1.0[a]
Imports	6.0	-12.1	11.7	4.7	1.0	1.5[b]
US						
GDP	3.0	-2.8	2.5	1.8	2.8	1.9
Eurozone						
GDP	2.1	-4.4	2.0	1.6	-0.7	-0.7[a]
Developing economies						
GDP	5.6	3.1	7.5	6.2	4.9	4.5[b]
Imports	8.8	-8.3	14.7	8.8	5.5	5.0[b]
Global trade	6.7	-10.6	12.8	6.1	2.7	2.9[b]

[a] Data for 2013 are based on the first three quarters.

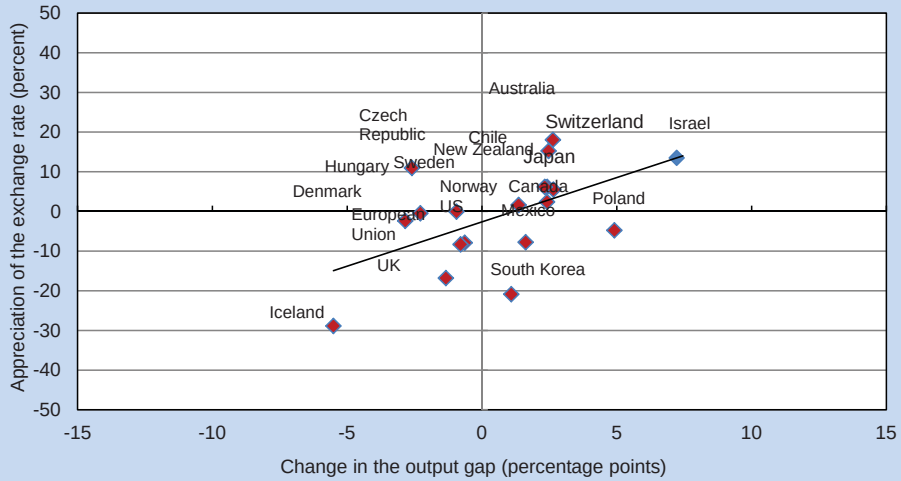
[b] Data for 2013 are based on estimates

SOURCE: Based on International Monetary Fund and OECD.stat.

import last year following the termination of natural gas supplies from Egypt and the depletion of the supply from the Yam Tethys reservoir. This substitution made a positive contribution this year to the current account surplus and contributed to the appreciation of the exchange rate, effects which are expected to continue in coming years. This type of appreciation—the result of an increase in a country's wealth following the discovery of a natural resource—may have a negative effect on other industries in the economy. This phenomenon is known as the "Dutch disease" and can be offset through policy measures. The Bank of Israel adopted such a policy this year and the government is planning to do so in the future, by means of a fund that will invest part of the gas revenues abroad. However, the natural gas discoveries also lead to an appreciation of the real exchange rate through the reduced exposure of the economy to fluctuations in global energy prices and the resulting reduction in Israel's risk premium. Although these positive developments in the energy sector and their effects on the exchange rate were expected, to one extent or another, since the discovery of the natural gas reservoirs, the markets nonetheless attributed importance to the start of production from Tamar and it is even possible that there was an overreaction.

There was some reduced tension in Israel's security situation this year and the economy benefitted from a decline in its risk premium. Part of the real appreciation that began this year reflects the reversal of the depreciation that accompanied the increased geopolitical risk facing the economy last year.

Figure 2.1
International Comparison of the Real Appreciation Between the Years 2006–07 and the Years 2012–13, and the Output Gap[a] Created During that Period Compared to the OECD Average



[a] When the positive output gap grows, actual growth is higher than potential growth.
SOURCE: Based on OECD data.

The contribution of fiscal policy to growth was lower this year than the long-term average, due to the measures required in order to reduce the structural deficit.

The structural component of the government deficit has grown to high levels in recent years and the government this year took steps to reduce it (Table 2.5), primarily by raising statutory tax rates, cutting child allowances and reducing defense expenditures. These measures reduced the structural deficit by 0.6 percentage points and as a result the contribution of fiscal policy to growth was lower this year than the long-term average by 0.3 percentage points. This is in contrast to last year when its contribution was higher than the average.[2] The total reduction in the cyclically-adjusted deficit was larger (by about one percentage point) due to tax revenue windfalls.

In view of the factors contributing to moderation of activity, the Monetary Committee adopted an accommodative policy, which moderated the appreciation and its negative effect on exports, and supported domestic demand.

The Monetary Committee responded to the weakness in foreign demand, the real appreciation and the steps taken by the government to reduce the deficit by further reducing the interest rate and purchasing foreign currency. These steps moderated the appreciation and its negative effect on exports, both due to its cyclical component and the concern regarding "Dutch disease".[3] The lowering of the interest rate stimulated domestic demand through two main channels: First, it lowered the price of credit to businesses and households and reduced the incentive to save.[4] It also reduced the burden of monthly payments for a significant proportion of mortgage holders and thus encouraged private consumption. At the same time, the restrictions put in place by the Supervisor of Banks in recent years in order to maintain the stability of the banking system apparently also created a moderating effect on the demand for new mortgages. Second, the low rate of interest led to a wealth effect among the public since their portfolio of assets increased in value and in addition the increase in home prices increased the wealth of home owners and therefore increased consumption.[5]

2. AGGREGATE DEMAND AND USES

a. The composition of demand from abroad and from the domestic market

Domestic demand led economic growth this year while weak foreign demand and the real appreciation further weakened exports. The bias in favor of domestic demand is reflected in the fact that the nontradable industries grew at a faster rate than the manufacturing industry.

Domestic demand led economic growth this year while weak foreign demand and the real appreciation weakened exports. Figure 2.2 indicates the gradual decline in the contribution of exports to the growth in uses from 2010 to 2013, while the contributions of private and public consumption remained stable during this period.

The imbalance between the two sources of demand is reflected in the output of the various industries in the economy (Table 2.4). The bias in favor of domestic demand

[2] For the analysis, we used elasticities from Mazar, Y. (2013), "Fiscal policy and its effect on GDP and its components", Bank of Israel Survey no. 87. The method for calculating the structural deficit appears in Mazar, Y. (2014), "Changes in the structural deficit in Israel during the period 2000–2012", Bank of Israel, discussion papers.

[3] This concern led the Bank of Israel to declare in May that it will implement a program of foreign currency purchases in coming years, at least until the creation of the wealth fund, which is expected during 2018. This announcement can be found at: www.boi.org.il/en/NewsAndPublications/PressReleases/Pages/13052013m.aspx.

[4] For further details, see Chapter 4: The Financial Markets.

[5] Kahan, M. and S. Ribon (2013), "The effect of home and rental prices on private consumption in Israel – a micro-data analysis", Israel Economic Review, no. 87.

is reflected in the fact that the nontradable industries grew at a much faster rate in recent years. It is also reflected in the domestic sales of the manufacturing industry increasing at a more stable rate of growth than that of sales to abroad in recent years. However, the domestic sales of the manufacturing industry declined this year due to the real appreciation, which had a contractionary effect on the whole tradable sector. This is because it reduced the price of competing imports and shifted consumption to those imports, as can be seen, for example, in Figure 2.4 below. The rate of growth in the output of the construction industry was lower this year, which continued the trend observed last year and followed the large increase during the period 2009–11. The output of the electricity industry increased sharply, following a large decline in the previous year. This reflects the benefit from the start of natural gas production this year, in contrast to the previous year when the shift towards expensive energy sources had a negative effect. The output of public services grew only moderately even though the number of employees in this sector increased, due to the partial offsetting effect of the decline in number of work hours per employee.

Table 2.3

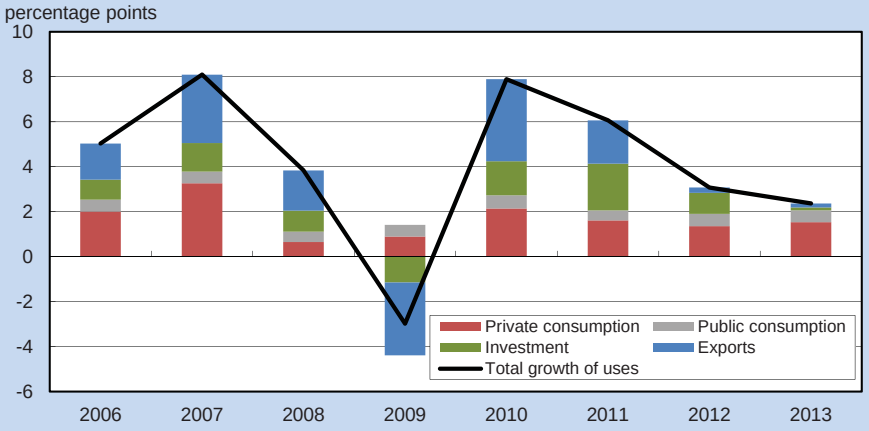
Sources and uses, 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
GDP	4.0	1.2	5.7	4.6	3.4	3.3
Imports excluding planes, ships and diamonds, and excluding defense imports	5.6	-11.9	12.1	8.9	5.2	-2.7
Domestic uses	3.3	0.6	5.5	5.7	3.7	2.9
of which: Private consumption	4.2	2.2	5.0	3.8	3.2	3.7
Investment in fixed assets (excluding ships and planes)	1.9	-4.6	9.2	16.2	3.2	0.8
Investment in inventory as a percentage of GDP	-0.3	-0.4	-0.3	-0.4	0.3	6.0
Public consumption excluding defense imports	2.1	4.6	2.7	2.3	2.8	3.1
Exports excluding diamonds and start-ups	8.5	-10.2	13.3	6.6	4.1	-1.2

SOURCE: Based on Central Bureau of Statistics data.

Figure 2.2
Total Growth of Uses (percent) and Contribution of the Components (percentage points), 2006–13



SOURCE: Based on Central Bureau of Statistics.

Table 2.4
Change in output of principal industries, 1995–2013

(annual change, percent)

	Weight in total output	1995–2008	2009	2010	2011	2012	2013
Total[a]		4.1	1.2	5.7	4.6	3.4	3.3
Public services	16.2	1.9	3.5	2.4	3.5	3.1	2.4
Business sector	71.5	4.5	0.7	6.4	4.6	3.5	3.5
Manufacturing	14.9	4.0	-5.6	14.9	-0.4	8.8	0.7
Commerce	9.4	4.6	-0.4	7.4	4.4	2.7	2.1
Business services	22.9	5.7	0.6	1.3	5.1	2.7	3.4
Construction	5.5	-0.1	2.4	11.1	11.0	4.8	3.0
Transport and Communications[b]	13.6		5.6	7.2	4.8	2.4	8.6
Agriculture	1.8	3.6	16.0	-9.8	4.3	7.4	0.5
Electricity and water	0.8	4.6	25.2	32.6	-5.7	-46.5	55.7

[a] The data on changes in total output in this table are different from the data in Tables 2.1 and 2.2, since their source is in industry data and not uses data.

[b] In view of the change that was made in the definition of the series, data for 1995–2008 are based on a definition that is different from that for the data from 2009–2013.

SOURCE: Based on Central Bureau of Statistics data.

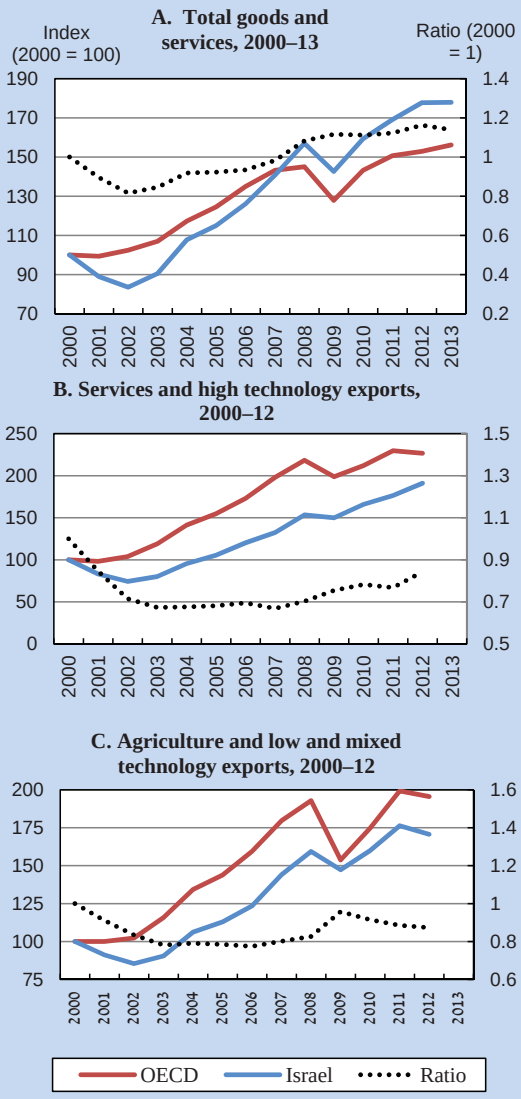
b. Foreign demand and exports

Exports (excluding diamonds and the sale of startup companies) shrank in 2013 by 1.2 percent. The main factor affecting exports in recent years, and particularly this year, is the continuing global economic crisis and the weakness in foreign demand (these trends are described in Section 1b above, which discusses background conditions). Nevertheless, the small drop in Israel's exports this year occurred despite the growth in trade of the developed countries. This is reflected in the ratio between them, which declined this year after an almost uninterrupted uptrend since 2004 (Figure 2.3a).

The small decline in Israel's exports this year occurred despite the slight growth in trade of the developed countries.

The ratio between Israel's exports and the trade of advanced economies continued to rise also during 2010–12, due to the rapid and uninterrupted increase in the export of high tech goods and services, industries that are characterized as having some influence on price and high profit margins (Figure 2.3b). This occurred while the ratio between the export of agricultural goods and of medium-low technology manufactured goods and the volume of trade of advanced economies in those goods has fallen since 2010, following an uptrend between 2007 and 2009 (Figure 2.3c). There is still no data for 2013 on global exports broken down by industry, but detailed data for Israel indicates that this trend became even more pronounced this

Figure 2.3
The Ratio Between Israel's Exports and the Trade of Advanced Economies[a,b],



[a] The OECD countries are represented by the US, EU and Japan.
[b] High technology manufacturing includes the electronics and pharmaceuticals industries. Medium-high, medium-low, and low technology mnaufacturing includes the food, textile, clothing, chemicals (excluding pharmaceuticals), machinery and equipment, transport equipment, and office equipment industries. Data on the remaining manufacturing industries—about 10 percent of exports—were not available.

SOURCE: Based on World Trade Organization.

year. Thus, services exports continued to increase this year, though at a more moderate rate than last year, while the export of goods fell, particularly as a result of the drop in the exports of the medium-low manufacturing industry.

The recovery in exports among some of the countries hardest hit by the crisis, along with the effect of changes in exchange rates, partially offsets the increase that occurred in the share of Israeli exports in world trade during the initial years of the crisis.

Figure 2.3c indicates that although in recent years there has been a weakening of Israeli exports of low technology goods, the situation is better than it was in 2006, prior to the crisis. This is because during the period 2007–09 the export of these goods reacted only moderately to the negative shock from abroad. The weakening that has occurred in recent years, as a result of the recovery in exports among some of the countries hardest hit by the crisis, has only partially offset the increase that occurred in the share of Israeli exports in world trade during the initial years of the crisis. Also contributing to the offset is the exchange rate between these countries, such that the real appreciation in countries such as Israel negatively affects the profitability of their exports and offsets their advantage, while the depreciation in countries hardest hit by the crisis contributes to their recovery.

The appreciation mainly affected industries with low technological intensity. The accommodative policy has weakened this effect.

The indications that the real appreciation had a moderating effect on exports is consistent with the results of models used to estimate the quantitative effect of the real exchange rate on exports on the macroeconomic level. Thus, according to these models, an appreciation of one percent leads after about one year to a drop of about 0.2 percent in total exports. The results also indicate that changes in the real exchange rate have a larger effect on industries with low technological intensity.[6] The accommodative policy adopted in recent years has weakened this effect but at this stage it is difficult to quantify its contribution to the trend in exports in recent years.

The rapid increase in the export of advanced services is compensating for the erosion of the relative advantage of electronics manufacturing in the advanced economies, and the total exports of the high technology industries has grown at a respectable pace.

Israel's services exports, as noted, continued to increase this year (by 6.1 percent or by 3.0 percent if the sale of startup companies is excluded), despite the slowing of the rate of growth. This was in particular thanks to the rapid growth in global demand for computer and R&D services. Israel has a comparative advantage in these industries and has managed to maintain its market share in this fast-growing industry and even expand it. As a result, the proportion of computer and R&D services in Israel's total exports has also grown.[7] In contrast to the global demand for advanced services, the global demand for electronics has slowed.[8] The weakening of global demand for electronics, together with the increase in supply from the developing countries (primarily China and Eastern Europe), is eroding the profit margins in the electronics manufacturing industry in Israel and other developed countries. However, as can be

[6] See, for example, Box 2.3 in the Bank of Israel Report for 2008 and also Soffer, Y. (2005), "Measuring the real exchange rate and its effect on exports and imports", Bank of Israel, Issues in Foreign Currency.

[7] The export of computer and R&D services (excluding the sale of startup companies) is equal in value to 25 percent of the total exports of goods (excluding diamonds, ships and planes) but its proportion of the value added from exports is even larger since, relative to the export of goods, the export of services includes only a small component of imports (10 percent as opposed to 25–30 percent for the export of goods). According to estimates, the valued added by the export of human-capital-intensive services (including startup companies) is equal to 50–60 percent of the value added from Israel's export of goods (in 2013).

[8] The annual rate of growth of world trade in high tech goods fell to only 3 percent during the period 2005–11, in comparison to 8 percent during the six previous years (1999–2005).

seen, the export of services is compensating for this and the total exports of the high tech industries—both goods and services—has grown at a respectable pace.

c. Domestic demand and uses

The crisis abroad, as well as the government's structural deficit, increased pessimism and acted to moderate domestic demand. The accommodative monetary policy and the continued decline in the structural unemployment rate contributed to the stability of domestic demand.

Although domestic uses constituted a stabilizing factor for growth, the global crisis also weakened domestic demand by reducing the growth in the real wage, which occurred during the course of the year (Figure 2.12). This was also reflected in the increasing pessimism among households and in the Consumer Confidence Index, which has been falling since the beginning of 2011. The recognition of the need to cut government expenditure and raise taxes and the implementation of some of the plans to carry out these measures have had their effect and the Consumer Confidence Index dropped even further in months when budget adjustments were presented and approved. Against the background of factors that worked to contract domestic economic activity, the contribution of monetary policy to the expansion of domestic economic activity becomes even clearer.

Table 2.5
Background conditions and main indices of the development of domestic demand, 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
Private consumption	4.2	2.2	5.0	3.8	3.2	3.7
***of which*: Current consumption**	3.6	2.5	4.9	3.3	3.5	3.4
Consumption of durables	5.2	-4.7	9.0	7.9	0.1	3.7
Credit to households	5.1	7.8	9.2	6.9	5.3	7.1
Value of the public's asset portfolio	10.5	22.5	11.1	-1.2	7.8	8.8
Consumer Confidence Index	-2.3	8.3	15.1	-11.3	-7.4	-1.4
Fixed capital formation (excluding ships and planes)	1.9	-4.6	9.2	16.2	3.2	0.8
Credit to the business sector	8.2[c]	-1.0	3.7	3.2	1.1	-2.1
Purchasing Managers' Index[a] (level)	51	48.4	54.8	48.7	43.2	47.7
Public consumption excluding defense imports	2.1	4.6	2.7	2.3	2.8	3.1
Government budget deficit	4.5	5.3	3.6	2.7	3.9	3.2
Change in the structural deficit[b]		1.4	-0.7	-0.1	1.4	-0.5

[a] When the value of the Purchasing Managers' Index is equal to 50, it indicates that there was no relative change in the preceding period. When the value is higher (lower) than 50, it indicates expansion (contraction).

[b] The change in the structural deficit is the change derived from changes in the statutory tax rates and from changes in planned expenditure according to the budget.

[c] The figure relates to the years 1999–2008.

SOURCE: Based on Central Bureau of Statistics, the Globes-Smith Consumer Confidence Survey, and the Purchasing Managers' Index of the Purchasing Managers Association and Bank Hapoalim.

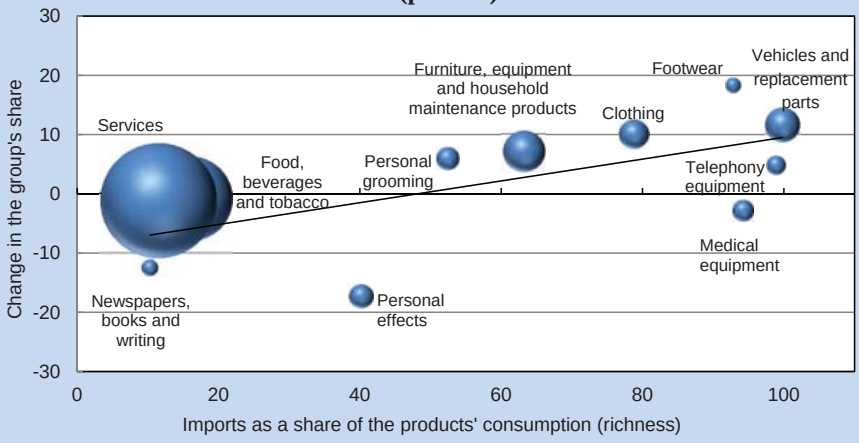
Private consumption

The rate of growth in private consumption remained stable due to the continued increase in current consumption. The cyclical response of private consumption to the slower rate of growth was reflected in a drop in the growth of durables consumption.

The rate of growth in private consumption rose somewhat this year to 3.7 percent and overall is similar to the rate of growth during the previous two years. The stability in the rate of growth of consumption, and in particular current consumption, is noteworthy in view of the negative effect of the global crisis on the remaining uses and the increases in taxation. The positive conditions in the labor market, and in particular the continuing decline in the structural component of the unemployment rate, also provided support for the stability in the growth of private consumption. The proportion of private savings within national income rose somewhat as a result of the start of natural gas production from the Tamar reservoir, which reduced the consumption of the expensive diesel fuel and fuel oil that the economy was forced to import last year.

The cyclical response of private consumption to the slower rate of growth was reflected in a significant drop in the rate of growth of durables consumption, particularly durables other than vehicles, and in the slow growth in the consumption of semi-durables.[9] Current consumption constitutes about 85 percent of total private consumption and it grew this year by a rate that was almost identical to that during the last two years (3.5 and 4.0 percent) and quite similar to its long-term average and the economy's rate of growth. The fact that the growth of current consumption is not

Figure 2.4
Change Between 2006-07 and 2012-13 in the Share of Consumer Product Groups out of Total Private Consumption[a], by Import-Intensive Industries in 2006 (percent)



[a] The size of the circle represents the share in total consumption in 2006-07.

SOURCE: Based on Central Bureau of Statistics.

[9] The term "semi-durable goods" relates to a new category adopted by the Central Bureau of Statistics. It includes textiles, clothing and footwear and the like, which account for about 5 percent of consumption. This is in contrast to durable goods, such as electrical goods and furniture (which constitute about 10 percent of consumption).

declining, despite the gradual decline in the rate of growth during the last two years and the increases in taxation (both those planned and those already implemented), is probably evidence that households view the worsening economic situation as temporary and not reflecting a change in permanent income. And indeed, during the course of the year, the plan to raise the income tax was cancelled.

The real appreciation was an additional factor that supported private consumption since it reduced the relative price of imported consumption goods and to some extent the prices of domestic substitutes.[10] Figure 2.4 shows the positive relationship between (1) the import intensity of a particular group of goods[11] and (2) the change in their share of total consumption during the last two years relative to the years prior to the global crisis.[12] It appears that the real appreciation shifted consumption to import-intensive groups of goods and this contributed to the increase in imports and in private consumption.

The real appreciation supported private consumption since it reduced the relative prices of imported consumer goods.

Public consumption

Public consumption, excluding defense imports, grew this year by 3.1 percent, which is similar to its annual rate of growth since 2006. Between 1996 and 2005, public consumption (excluding defense imports) grew at an average rate of 1.8 percent and at an even slower rate during the second part of that period, which was characterized by fiscal consolidation. Since then, public consumption has grown at an average rate of 3.1 percent. This year, the rate of increase was more moderate for most components while for defense purchases it accelerated somewhat.

Public consumption grew this year at a rate similar to its annual rate of growth since 2006.

Investment

Domestic gross investment grew this year by 0.8 percent, which included an increase in inventories. Fixed capital formation increased only somewhat (Table 2.5), which was a continuation of the significant decline in its rate of growth last year. Nonetheless, the level of investment remained high and the capital stock in the business sector grew by 5.2 percent.

Figure 2.5 shows the contribution of the various components to the growth of fixed capital formation. It can be seen that the gradual completion of large and one-time investments—in equipment and machinery in the energy sector and the electronic

The increase in fixed capital formation was halted, mainly due to the gradual completion of large and one-time investments, and due to moderating economic activity. With that, the level of investment remained high and the rate of capital inventory growth in the business sector remained stable.

[10] See, for example, the results of the DSGE model of the Research Department at the Bank of Israel.

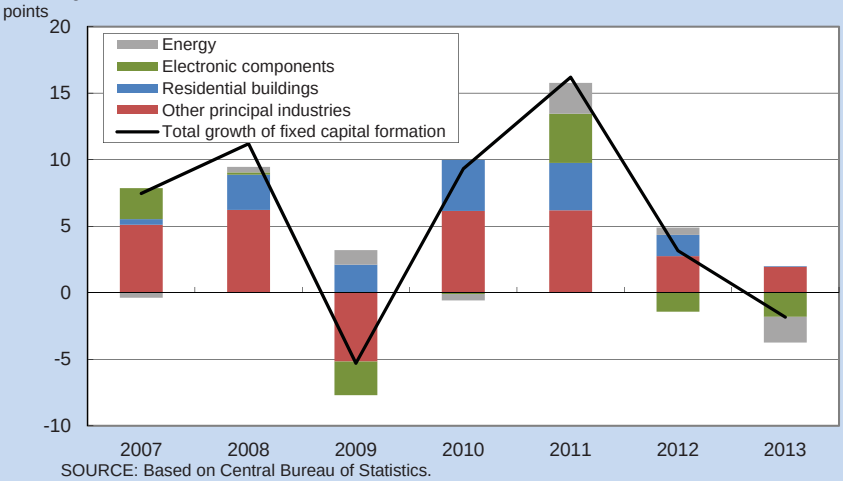
[11] The proportion of imports in the consumption of each good was calculated according to Orfaig, D., "Transmission channels from the exchange rate to the CPI: a macro-sector look at the tradable component of the index", forthcoming discussion paper of the Bank of Israel.

[12] In order to rule out the possibility that the positive relation is the result of the first stage of implementation of the 2012 plan to reduce tariffs, the analysis was also carried out for the pair of years 2010–11 relative to the same base period (2006–07). The findings remained unchanged and with similar magnitudes. The analysis was also carried out for the pair of years 2008–09 relative to the base period. Although a positive relationship was found between the variables, it was of a lower magnitude and this is evidence that most of the effect was felt only with a lag and as a result of the continuation of the appreciation.

components industry—explains about half of the drop in the rate of growth in investment in fixed assets during the last two years (from 16 percent in 2011 to approximately 1 percent in 2013). The large investments in the energy sector are connected to the discovery of natural gas and their timing is not influenced by the business cycle. The large investments in the electronic components industry are related to the opening of the new Intel factory. The decrease in investment was spread over the last two years and made a negative contribution to the rate of growth in investment in the economy.

The growth in investment in residential buildings came to a halt in 2013, which contributed about 1.5 percentage points to the decline in fixed capital formation (similar to its negative contribution in the previous year). Nonetheless, the scope of construction has been at record levels in recent years, particularly this year when the number of housing starts renewed its uptrend as a result of the high level of demand and the rise in home prices.

Figure 2.5
Total Growth in Fixed Capital Formation (percent) and Contribution of the Components (percentage points), 2007–13



SOURCE: Based on Central Bureau of Statistics.

The decline in the rate of increase in industrial investment, apart from the energy industry and the electronic components industry, explains the remainder of the drop in the growth rate of fixed capital formation during the last two years. Although the rate of growth in industrial investment grew somewhat relative to the previous year (again ignoring the outlier industries in this respect), this is a result of investment in vehicles being moved forward as a result of the changes in the "green" tax rules, while the investment in machinery and equipment remained unchanged this year. The decrease in utilization of machinery and equipment, against the background of a slowdown in demand during the last two years, lessens the need to purchase physical capital. The decrease in the Purchasing Managers Index reflects to some extent the pessimism in

the business sector and also helps to explain the weak level of industrial investment during the last two years.

Notwithstanding the aforementioned, industrial investment is not declining and that is encouraging, particularly since investment in the developed countries decreased sharply, even beyond what would be dictated by the their low rates of growth. In particular, the proportion of investment in the manufacturing industry within total business sector investment has not declined significantly despite the continuing drop in the share of manufacturing output within total business output (even after excluding the one-time investments during the last two years in the electronic components industry and in the mining and quarrying industry). The conclusion from this analysis is that the negative trend in the manufacturing industry is viewed by investors, at least for now, as cyclical and temporary. The stability of investment in Israel is a result of, among other things, the fact that the output gap that has developed here is not as significant as in countries that were directly affected by the financial crisis. Thus, current monetary policy is apparently encouraging companies to maintain their production capability and it is also possible that the relative price of imported investment goods has fallen as a result of the appreciation.

3. SUPPLY AND EQUILIBRIUM

a. Sources of growth and the output gap

Potential business sector product

According to the production function approach used in the following analysis, potential output is that which would have been achieved in a hypothetical equilibrium. Such equilibrium would be achieved when all the factors of production are employed at a rate of utilization that is similar to the long-term average and does not create price or wage pressure. The rate of growth of potential output is derived from the long-term growth trends of the various factors of production (physical capital, labor and human capital) and from the average growth in total factor productivity, which results from technological and other structural improvements.

The calculations according to this approach show that the rate of growth in potential business output was 4 percent in 2013, which is similar to the rate in the previous year but lower than during the high-growth years in the middle of the previous decade. The primary reason for this is the trend in potential labor input. Thus, although the long-term rise in the participation rate and the drop in the natural rate of unemployment have contributed to the growth in potential output, the rate of growth in the working-age population has gradually slowed.

The rate of growth in potential output was similar to the rate in the previous year but lower than during the high-growth years in the middle of the previous decade.

The rate of growth in the stock of physical capital was maintained relative to last year and despite the slowing of growth it is not low relative to its long-term average and relative to the high-growth years. This is because the level of investment in the economy has stabilized at an elevated level, thanks partly to the large-scale projects

Table 2.6

The supply of output[b], 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
Gross Domestic Product	4.0	1.2	5.7	4.6	3.4	3.3
of which: Business sector output	4.5	0.7	6.4	4.7	3.4	3.5
Public services output	1.9	3.5	2.4	3.5	3.1	2.4
Stock of physical capital of the business sector	5.4	4.2	3.0	3.7	5.2	5.2
Labor force	2.7	2.0	2.4	1.8	3.2	0.2
Total work hours	2.8	2.0	2.6	2.0	3.0	1.9
Total factor productivity	0.8	-1.9	3.5	2.0	-0.2	1.2
Product per work hour (nominal)[a]	4.8	3.2	2.8	3.7	5.5	3.5
Return on work hour (nominal)[a]	4.8	-2.3	4.2	5.9	2.5	1.2
Cost of labor per output unit[a]	0.0	-5.4	1.3	2.1	-2.8	-2.3
Rate of return on labor in the business sector (level)	65.5	60.8	61.6	62.9	61.1	59.7
Output gap	0.1	-1.7	-0.7	-0.1	-0.6	-1.2

[a] Following the change in the series definition, the data for 1995–2008 are based on a definition that is different from the data for 2009–13.

[b] Excluding gross domestic product, public services output, and the labor force. These data do not relate to the business sector.

SOURCE: Based on Central Bureau of Statistics.

in the energy sector and in the electronic components industry, which ensured that the stock of capital continued to grow at a relatively rapid pace again this year.

The contribution of human capital to potential growth gradually declined relative to its contribution until the end of the 1990s. This is expected to continue in coming years with an intensity that is primarily dependent on the extent to which additional populations acquire education that is relevant to the labor market.[13] Total factor productivity has been characterized by a stable rate of growth in recent years since its increase following the exit from the recession in 2001–03.

Actual sources of growth and the business sector product gap

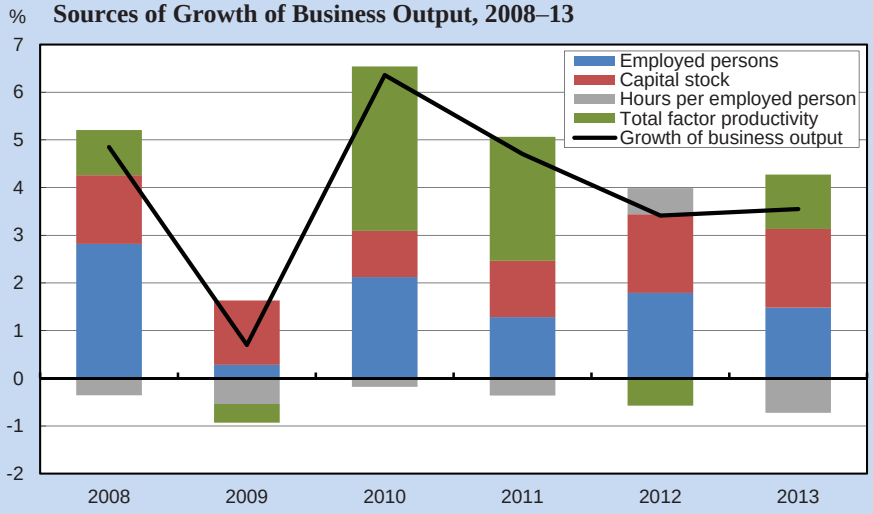
A breakdown of the actual sources of growth leads to the conclusion that there was a decline in the utilization of factors of production—capital and labor.

A breakdown of the actual sources of growth (Figure 2.6) shows that the gross capital stock grew in 2013 by a rate similar to that in 2012 and the number of employees rose at a somewhat slower rate. Total factor productivity rose by about 1 percent, which was the result of the start of gas production that led to a one-time jump in the growth rate of GDP.[14] If this jump is neutralized, total factor productivity remained

[13] For further details, see Recent Economic Developments 136.

[14] Capital stock has increased in past years as a result of the gas discoveries. It is reasonable to assume that this growth made a gradual negative contribution to productivity in previous years, which became a large positive contribution when production began this year.

Figure 2.6
Sources of Growth of Business Output, 2008–13



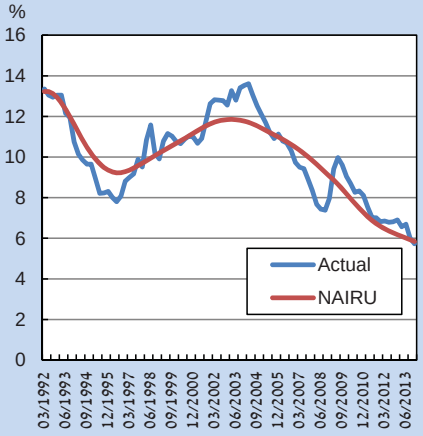
SOURCE: Based on Central Bureau of Statistics.

unchanged, which is not in line with its long-term growth trend. This outcome, as well as the decline in work hours per employee, reflects the drop in utilization of capital and labor.

Since potential output continued to grow at a rate similar to that in the previous year (about 4 percent) while in contrast the rate of growth in actual business output slowed, the negative output gap expanded (Table 2.6), following the small output gap that opened last year. The negative output gap is consistent with, among other things, the finding that the rate of unemployment is somewhat higher than the structural unemployment rate according to the NAIRU approach.[15] This provides additional confirmation of the hypothesis that part of the decline in the rate of unemployment in recent years was a result of a decrease in the structural rate.

The negative output gap expanded following the small output gap that opened last year.

Figure 2.7
The Unemployment Rate Compared to the Natural Unemployment Rate in the NAIRU Approach, 1992–2013



SOURCE: Based on Central Bureau of Statistics.
The NAIRU rate is calculated according to Ilek and Elkayam (2013). The reference appears in Note 15.

[15] Non-Accelerating Inflation Rate of Unemployment, which is the rate consistent with price stability, as calculated in Ilek, A. and D. Elkayam, "Estimating the NAIRU for Israel 1992–2011", Discussion Paper 2013.04.

b. The current account

The increase in the current account surplus is primarily the result of the completion of investment in the Tamar gas reservoir and the start of production during the second quarter of the year. Another factor is the deficit reduction policy adopted by the government.

The current account surplus grew this year, following the small surplus recorded last year, which was the result of the decrease in the deficit in the income account and an increase in the surplus of the goods and services account. The decrease in the deficit in the income account was a result of the foreign investors' lower profits from their investments in Israel, in contrast to the sharp and exceptional increase last year. The increase in the surplus of the goods and services account was primarily the result of the completion of investment in the Tamar gas reservoir and the beginning of production during the second quarter of the year. This event had a dual impact on the economy: First, the start of production reduced the consumption of expensive diesel fuel and fuel oil, which the economy was forced to import last year in order to produce electricity when the supply of gas from Egypt was terminated and the gas from the Yam Tethys reservoir ran out. Second, the large investment in the gas reservoirs, much of which involved the purchase of imported machinery and equipment, was completed this year, which also contributed to the drop in imports. A parallel analysis of how the start of gas production affected the current account surplus using the balance of savings and investment in the economy creates an even clearer picture. Thus, the increase in the import of expensive fuels, which made a negative contribution to the rate of saving last year[16] and led to an increase in investment in the gas reservoirs, contributed to the reduction in the gap between saving and investment last year and to a reduction in the current account surplus. This year, the investment in the reservoirs was completed and its yields contributed to an increase in saving, which led to an increase in the saving surplus and in the current account surplus.

The attractiveness of the Israeli economy relative to other economies was reflected this year in a significant increase in the inflow of direct investment.

An additional factor behind the transition to a current account surplus is the deficit reduction policy adopted by the government, which increased public and national saving. Findings show that a reduction in the government deficit leads to a drop in the current account deficit through the decrease in civilian imports.[17]

The attractiveness of the Israeli economy relative to other economies was reflected this year in a significant increase in the inflow of direct investment. The increase in the current account surplus and in net direct investment in the financial account (which is discussed in Chapter 4) summed to a surplus of greater than $9 billion in the basic account (Figure 3.5), which was one of the main sources for the increase in the net inflow of foreign currency into the economy. This is in contrast to years in which the increased inflow of foreign currency into the economy was primarily the result of changes in short-term capital inflows. In contrast, direct investment is considered to be long term since it provides nonresidents with the rights to manage Israeli companies.

[16] Since the government decided to smooth the effect of the gas shortage on electricity prices, the effect was manifested in a loss for the Israel Electric Corporation in 2012 and in its profitability in coming years, until the loss due to the gas shortage is covered. The Israel Electric Corporation's profit and losses are reflected in business saving.

[17] Mazar, Y. and M. Haran, "Fiscal policy and the current account", Bank of Israel, Discussion Paper 2012.09.

Table 2.7
Savings, investment and the current account as a percentage of national income, 1995–2013

	1995-2008	2009	2010	2011	2012	2013
Gross national savings	19.5	21.3	20.9	21.1	21.0	21.9
of which: Public	-0.5	-2.7	-1.4	-0.6	-1.6	-0.9
Private	19.9	23.9	22.3	21.7	22.6	22.8
Gross investment	19.8	17.4	17.9	19.8	20.6	19.5
of which: In principal industries	13.4	12.9	12.7	14.1	0.3	0.1
In housing	5.4	5.1	5.5	6.0	14.2	13.3
In inventory	1.0	-0.6	-0.4	-0.2	6.2	6.0
Net current account	-0.4	3.8	3.1	1.3	0.3	2.4
of which: Balance of goods and services	-2.4	2.8	1.7	-0.5	0.2	1.2
Net income account	-3.1	-2.5	-2.2	-1.7	-3.1	-1.9
Net current transfers	5.1	3.5	3.5	3.4	3.3	3.1
Terms of trade[a]	0.1	10.4	-4.4	-6.7	6.5	1.3
Real effective exchange rate[a]	0.8[b]	1.8	-5.1	-1.0	4.5	-6.4

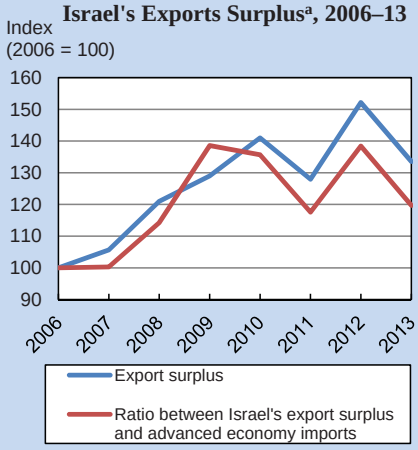
[a] Percent change in annual terms.

[b] The figure relates to the years 1999–2008.

SOURCE: Based on Central Bureau of Statistics.

Although the increase in the basic account surplus is due to the success of the economy in increasing the export surplus and the inflow of direct investment during the years of the global crisis, the accompanying appreciation acted to gradually balance the current account and to reduce Israel's growth advantage. Section 2.1 described the indications that in recent years the appreciation had a negative effect on exports while Section 2.2 described the indications that it had a positive effect on the import of consumption goods. An overall analysis of the export surplus (while excluding several items;[18] Figure 2.8) also provides

Figure 2.8
Israel's Exports Surplus[a], 2006–13



[a] Excluding ships and planes, defense imports, diamonds and energy. Further explanation apepars in note 18.
SOURCE: Based on Central Bureau of Statistics.

The appreciation accompanying the increase in the current account surplus and the increase in the inflow of direct investment is acting to offset the current account surplus and is reducing Israel's growth advantage.

[18] The export surplus analyzed here does not include items on a macroeconomic scale, such as ships and aircraft, defense imports, diamonds and energy imports, since their movements do not generally reflect the macroeconomic factors whose effect we are analyzing here.

support for these findings since the surplus rose during the initial years of the crisis and has tended to level off in recent years. This is particularly the case if one takes into account that a notable part of the increase last year was the result of an outlier event, i.e., the opening of the new Intel factory.

4. MACROECONOMIC DEVELOPMENTS IN THE LABOR MARKET

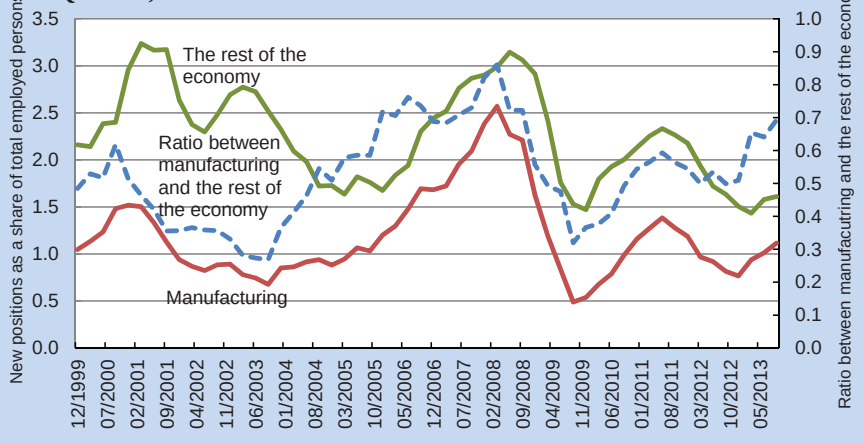
a. The demand for labor

Demand for labor in the business sector moderated as a result of the slowdown in the growth rate.

The slowdown in the rate of increase in aggregate demand that began in mid-2011 and in the rate of growth of output per hour worked (Table 2.6) led to a weakening in demand for labor in the business sector, as was reflected in the rate of new job creation (both filled and unfilled positions; Figure 2.9). The rate of job creation was low relative to the last two years and certainly lower than at the end of 2007.

The graph also shows that the rate of job creation in manufacturing has fallen more sharply since 2008 than in other industries. Manufacturing is the main tradable industry in the economy and the fact that the demand for labor in manufacturing fell to a greater extent is the result of weak foreign demand and the appreciation of the exchange rate. As described in earlier sections, these factors had a significant effect on the exports of the low technology and medium high/medium low technology manufacturing industries during the last three years while services exports have continued to grow uninterrupted. Nevertheless, during the course of the year there was an improvement in favor of manufacturing, in particular as a result of the increase in the rate of new unfilled positions. It is possible that this improvement reflects the first

Figure 2.9
Rate of New Positions (Vacant and Filled) in Manufacturing and the Rest of the Economy, and the Ratio Between Them, Moving Average over 4 Quarters, 2000–13



SOURCE: Based on the Ministry of Economy's Survey of Job Vacancies.

signs of recovery that were seen this year in the US and the EU, which are the main destinations for Israeli exports.

The growth in the labor force moderated as a result of the halt in the continued increase in the proportion of the population with higher education—individuals who typically have a high labor force participation rate—and due to the aging of cohorts that were characterized by a higher rate of growth than the cohorts that are currently of working age.

b. The supply of labor

The growth in the labor force was moderate this year (Table 2.8) relative to last year. This was due to the leveling off this year of the uptrend in the participation rate, an uptrend which was due mainly to the increased proportion of the population with higher education. There are indications that this growth reached its peak in recent years and that it can be expected to weaken since the proportion of those studying in institutions of higher education has reached a high level relative to other countries among most sectors of the population. The rate of increase in the labor force was also slower than during most of the previous decade. The rate of increase of the primary working-age population (aged 25–64) is low relative to past years due to the exit of

Table 2.8
Principal labor market data, 1995–2013

(annual change, percent)

	1995-2008	2009	2010	2011	2012	2013
Working age population (15+)	2.3	1.8	1.7	1.8	1.6	1.8
Labor force participation rate (level)	59.8	62.1	62.6	62.6	63.6	63.7
Labor force	2.7	2.0	2.4	1.8	3.2	2.0
Employment rate (level)	54.0	56.6	57.6	58.2	59.2	59.8
Unemployment rate (level)	10.7	9.5	8.4	7.1	6.9	6.2
Principal working age population (25–64)	2.9	1.1	2.1	1.6	1.1	1.3
Labor force participation rate among principal working ages (25–64) (level)		76.7	77.1	77.5	78.6	78.8
Employment rate among principal working ages (25–64) (level)		70.7	71.8	72.8	74.0	74.5
Unemployment rate among principal working ages (25–64) (level)		8.3	7.2	6.1	5.9	5.5
Employed persons	2.9	0.7	3.3	2.8	3.1	2.8
of which: Employed in the business sector	3.0	0.4	3.1	1.9	2.6	2.2
Employed in the public sector	2.6	1.3	3.6	4.9	4.0	4.2
Total work hours	2.9	2.2	2.7	2.6	2.6	0.3
of which: Total work hours in the business sector	2.8	2.0	2.6	2.0	3.0	0.3
Total work hours in the public sector	3.3	2.8	3.0	4.7	1.1	1.1
Hours per employed person	0.1	1.5	-0.6	-0.2	-0.5	-2.1
of which: Hours per employed person in the business sector	-0.1	1.6	-0.5	0.1	0.4	-1.6
Hours per employed person in the public sector	0.7	1.5	-0.6	-0.2	-2.8	-2.9
Nominal wage per employee post	4.7	0.7	3.4	3.8	2.2	2.6
Real wage per employee post	1.1	-2.6	0.7	0.4	0.5	1.0

SOURCE: Based on Central Bureau of Statistics.

cohorts that were characterized by a higher rate of growth than the cohorts that are currently of working age.

c. Equilibrium in the labor market: employment, unemployment and wages

The slower rate of growth in the labor force this year meant that the rate of unemployment continued to decline at a rapid pace even though the rate of employment rose at a slower pace.

The unemployment rate in the economy declined this year, a continuation of the small decline last year. As a result of the weakening in the growth of demand for labor in the business sector, the employment rate increased by less than it did last year (Figure 2.10 and Table 2.8). The slower rate of growth in the labor force this year contributed to the fact that the rate of unemployment continued to decline at a rapid pace even though the rate of employment rose at a slower pace.

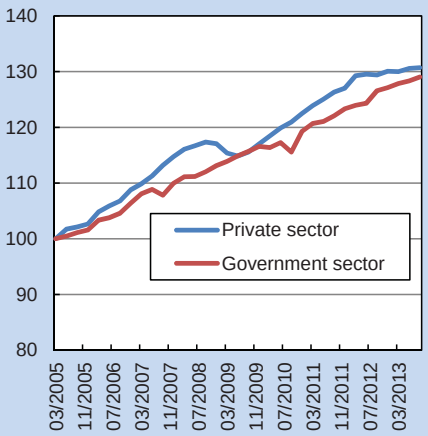
The increase in the rate of employment was the result of the relatively large rise in the number of employees in the public sector, while the number of employees in the business sector rose only moderately. The data for salaried positions (whose source is the National Insurance Institute) indicate even greater differences between the trend in the business sector and that in the public sector. Thus, the number of positions in the business sector remained unchanged during the past two years while in the public sector it continued to grow at a stable rate (Figure 2.11).[19]

The lack of change in the number of salaried positions in the business sector

Figure 2.10
Unemployment and Employment Rates[a], Principal Ages (25-64), Quarterly Data, 2005–13

[a] Employment rate - out of the working age population; Unemployment rate - out of those participating in the labor force.
SOURCE: Based on Central Bureau of Statistics.

Figure 2.11
Employee Posts in the Private and Government Sectors, Quarterly Data, 2005–13



SOURCE: Based on Central Bureau of Statistics.

[19] The discussion consistently relates to the division between the business sector and the public sector based on the Labor Force Survey, as can be seen for example in Table 2.8. However, Figure 2.11 is based on the data for salaried positions from the National Insurance Institute and therefore it relates to the division between the private and government sectors. According to the division in the Labor Force Survey, positions in health, education and welfare belong to the public sector even if the employer is a private entity.

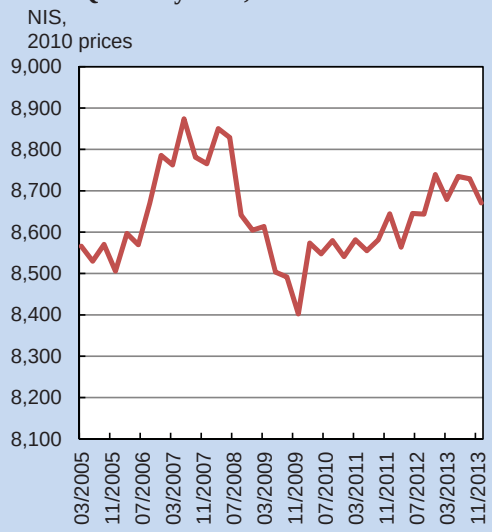
is consistent with other data that indicates weakness in the labor market, notwithstanding the drop in unemployment. Thus, the average work hours per employee fell such that even according to the Labor Force Survey labor input hardly increased this year and there was an increase in the proportion of part-time workers who would prefer to be in fulltime positions. Although the real wage rose on average relative to last year, part of the increase reflects the lower than expected rate of inflation, and moreover, the wage leveled off during the course of the year and even declined towards the end of the year (Figure 2.12). Finally, the decline in unit labor cost during the past two years (Figure 2.13) also provides support for the view that the factors of production are being less than fully utilized.

Despite the decline in the unemployment rate, there are signs of weakness in the labor market.

It is also worth noting the view that at least part of the drop in the unemployment rate is the result of long-term processes rather than the business cycle. There are two developments that support this view: First, there has been an increase in the share of industries in which retaining workers is important. Employers in these industries prefer to reduce average work hours rather the number of employees. Already during the first phase of the global crisis, the reaction of the labor market was moderate relative to the negative effect on economic activity. Second, there has been an increase in the efficiency with which positions are filled and in the proportion of workers with higher education. A more detailed discussion can be found in Chapter 5.

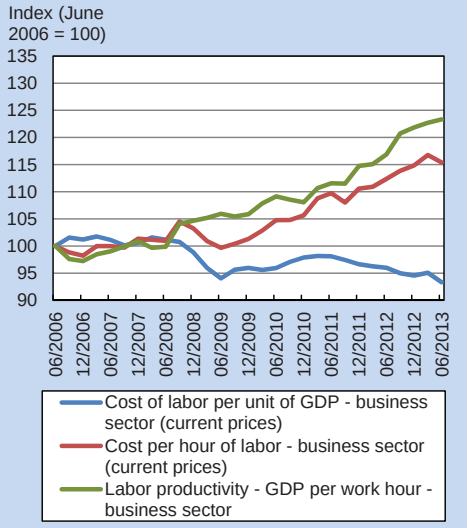
At least part of the drop in the unemployment rate is the result of long-term processes rather than the business cycle.

Figure 2.12
Real Wage per Employee Post, Quarterly Data, 2005–13



SOURCE: Based on Central Bureau of Statistics.

Figure 2.13
Labor Productivity, Cost of Labor, and Cost of Labor per Output Unit, Quarterly Data, 2006–13



SOURCE: Based on Central Bureau of Statistics.

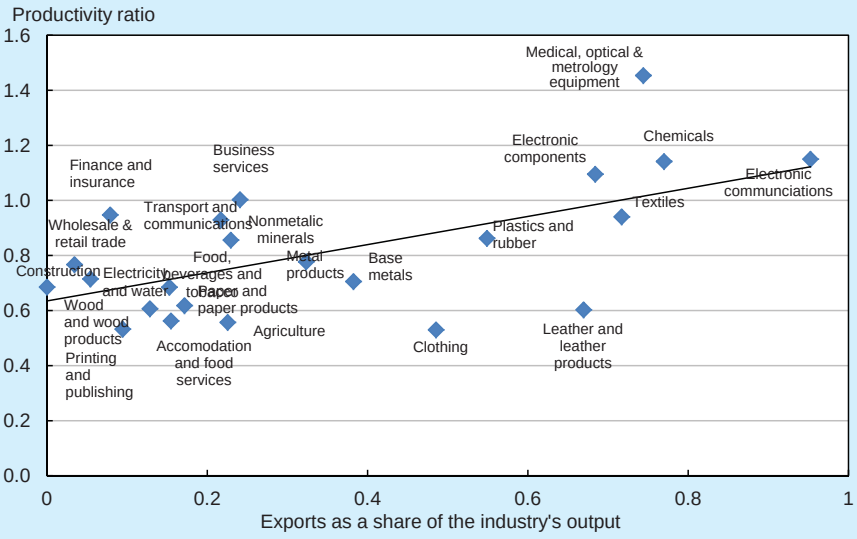
Box 2.1

Labor Productivity in Domestic-Market Oriented and Export Industries: An Analysis from an International Perspective

Labor productivity—the ratio between GDP and the number of employees—measures the economy's production capacity over time, taking into account the number of employees available to it. In Box 2.1 of the Bank of Israel Annual Report for 2012, it was found that in 2011 labor productivity in Israel was 14 percent lower than the OECD average, and output per hour of work was lower by 24 percent. The box noted several factors that may explain the lag. In addition, Brand[1] has found that productivity in domestic-market oriented industries is lower than productivity in export industries. In this box, we examine whether the inferior position of these industries is more significant in Israel than in other OECD members, and whether this provides part of the explanation of the lag in productivity in the total business sector.

As Figure 1 indicates, the gaps in labor productivity[2] range from 50 percent to Israel's disadvantage in the clothing sector and 30 percent to Israel's disadvantage in the construction sector, to more than 40

Figure 1
The Productivity Gap per IndustryBetween Israel and the OECD Average, and Exports as a Share of the Industry's Output in Israel, 2007



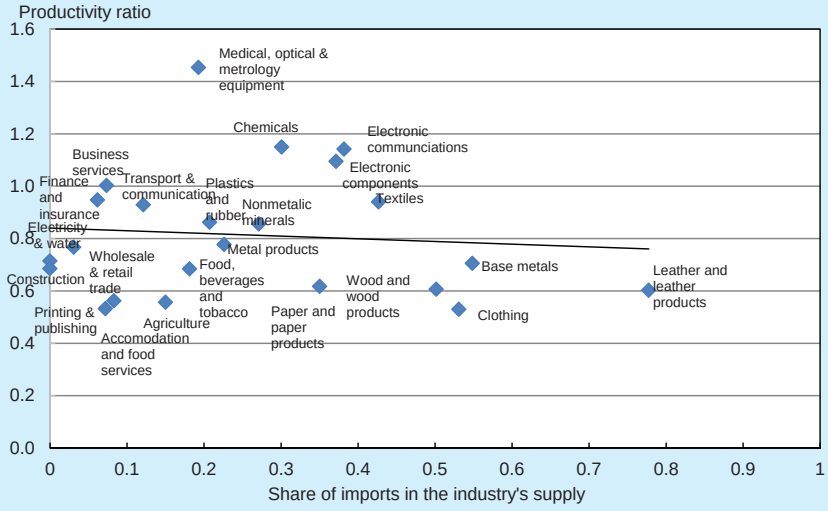
SOURCE: Based on OECD and Central Bureau of Statistics.

[1] Brand, Gilad, "Israel's Growth Paradox: Declining Productivity and Returns to Human Capital," The Milken Institute Fellows Program, 2014.

[2] The data that will be presented below in this box relate to productivity per employee and not productivity per work hour, since in the OECD there are only partial data on work hours at the industry-specific level. But when we examined the partial data, we found that relative to the OECD average, the number of work hours in Israel is similarly high in all industries. Therefore, the conclusions as to industry productivity gaps are not sensitive to whether productivity per employee is used instead of productivity per work hour.

percent to Israel's advantage in the medical equipment, optical equipment and metrology equipment sector. There is a gap to Israel's advantage in the electronics and chemicals sectors as well. The figure indicates that there is a positive correlation[3] between the share of exports in an industry's output and the productivity gaps (when they are to Israel's advantage). An examination shows that this correlation is almost unique to Israel, and that other than Israel, it is notable only in Germany and Denmark. A possible reason for this phenomenon is that export industries deal with tougher competition than some of the domestic-market oriented industries. The latter therefore have less incentive to become more efficient, particularly if there is little import competition relative to domestic output volume. However, as Figure 2 indicates, there is no evidence of such a connection. No correlation was found between the productivity gap and the share of import competition in total output. While the productivity gap is negative, for example, in the food industry—a field where there is a low percentage of competing imports—it is also negative in industries where competing imports constitute more than half of output that is sold in Israel, such as the clothing, leather goods, wood, paper, and the printing and publishing industries. It is likely that there is no positive connection between the two variables, because in these industries, too, there is basically little competition due to importer exclusivity, or because the high productivity of domestic production does not justify the entry of a competing importer.

Figure 2
The Productivity Gap per Industry Between Israel and the OECD Average, and the Share of Imports in the Industry's Supply in Israel, 2007



SOURCE: Based on OECD and Central Bureau of Statistics.

A second possible reason for the positive connection between the share of exports in an industry's output and productivity gaps is that the major export industries exploit Israel's relative advantage in the field of human capital and innovation. As has been written in this report in the past, the Israeli economy

[3] The connection between the variables was found in a regression to be statistically significant.

is characterized by duality: there are export industries which are human capital- and innovation-intensive, and there are industries suffering from inferior positions. This leads to the question of whether this duality is an exception in the world.

Table 1 finds clear signs of this. In Israel, relative to the OECD average, there is a high share of people with higher education in manufacturing industries that export most of their output, in the finance and insurance industries, and in the professional, technical and scientific services industries.[4] Productivity in these industries is not lower than the average productivity in OECD countries, and is even higher than it in some industries. In contrast, in industries in which the rate of higher education is similar to the rate in other countries, there is a productivity gap to Israel's disadvantage.

These findings on their own explain only the accomplishment of the successful industries, but cannot explain the lag in the rest of the industries. To complete the analysis, we compare the share of positions that require higher education[5] in Israel with the share in the OECD: In almost all industries where productivity is low, the share of positions that require higher education —particularly engineers and scientists—is lower than the parallel share in the OECD.[6] This is the case, for instance, in the manufacturing industries with relatively low exports, and in the construction and commerce industries which, by their very nature, are domestic-market oriented. The apparent conclusion is that those with higher education in these industries obtained education that is not relevant to the post they occupy. This finding is consistent with Brand's important finding that Israel has a very low return to education in primarily domestic-market oriented industries. The conclusion we draw helps to explain both the low productivity in these industries and the low return to education of their employees.

The data from Israel on the development of capital stock[7] per employee are consistent with the lag in productivity in the domestic-market oriented industries. As Figure 3 indicates, between 1995 and 2011, there was rapid and consistent growth in capital stock per employee in the manufacturing export industries[8], while growth was much more moderate in the other industries, reaching near zero by the end of the period.[9] The moderate increase in these other industries may derive from the fact that the marginal productivity of capital in these industries is lower, inter alia because of the weakness of human capital

4 This industry includes the computer and R&D industries among others.

5 Academic professions according to the Central Bureau of Statistics classification of occupations and the parallel international classification. They include, for example, engineers, scientists, economists, and accountants.

6 Exceptions are the agriculture industry and the electricity and water industry, because in both of these, there is a relatively high share of employees with higher education and low productivity. Apparently, other factors that are unique cause labor productivity to be low relative to the rest of the world in these industries (for example, differences in climate, differences in water prices and in the composition of crops in the agriculture industry, and differences in structural and infrastructural aspects in the electricity and water industries).

7 It is hard to make an international comparison of capital stock at the industry-specific level, because the data are very partial and of limited reliability.

8 We focus on manufacturing export industries because data on capital stock of the services export industries—such as the computer and research and development industries—are not available separately from data on other trade and services industries, most of which are domestic-market oriented.

9 While there was rapid growth of capital per employee in the construction industry during the industry's previous prosperity period, the growth was volatile between 2004 and 2011, ranging around the same level. The Bank of Israel Annual Report for 2010 also shows that the stock of capital in the industry is lower than elsewhere in the world.

Table 1

Productivity Gaps and Human Capital in the Principal Industries, Israel and the OECD Average, 2011**

		Share of employees with higher education*		Share of positions that require higher education		Share of engineer and scientist positions	
	Productivity gap	Israel	OECD average	Israel	OECD average	Israel	OECD average
Agriculture	-44.3	12.8	8.9	2.1	1.5	1.8	0.7
Manufacturing with a low share of export (20 percent and less)	-39.0	19.1	15.4	2.6	6.3	1.2	3.1
Manufacturing with a medium share of export (20–50 percent)	-28.3	14.9	13.7	3.0	6.2	2.7	3.5
Manufacturing with a high share of export (50 percent or more)	3.5	35.8	23.8	17.4	11.9	16.2	5.4
Construction industry	-31.5	9.6	13.1	3.5	5.1	3.1	3.3
Services and repairs industry	-23.3	15.4	15.9	2.3	5.4	0.7	0.6
Accommodation and food services	-43.7	-	-	-	-	-	-
Financial and insurance	-5.3	52.5	45.3	17.3	19.3	2.9	0.9
Real estate services		34.0	33.4	3.7	8.2	2.1	2.3
Professional, technical and scientific services	0.0	66.5	55.6	35.9	45.6	33.0	17.7
Personal and administrative services		16.9	18.2	1.7	5.5	0.2	0.8
Electricity	-29.0	39.2	29.6	22.4	17.1	20.3	6.8
Water		35.9	16.1	18.4	7.1	16.2	2.6

* Employees with higher education - at least a Bachelor's degree.

** The transport and communication industries are not presented because it is difficult to create data for parallel industries in the OECD.

SOURCE: Based on Central Bureau of Statistics, and OECD data.

found in them. This moderation is reflected, obviously, in the slow growth of labor productivity, but it may also reflect slowness in the assimilation of innovative technology.

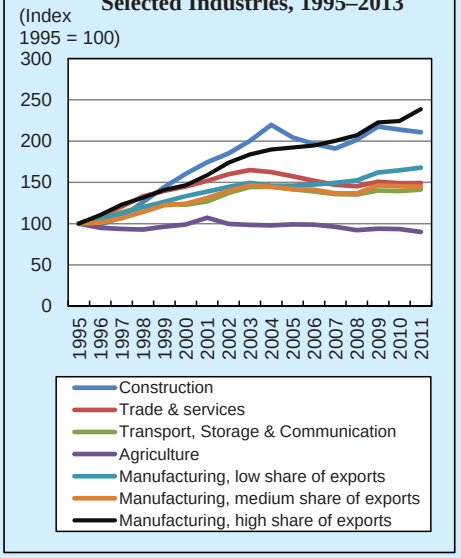
The findings brought herein bring the picture of duality in the economy into sharper focus. The export sector and some of the services industries have gradually exploited Israel's advantage in the field of human capital and innovation, yielding relatively high productivity. In contrast, the other part of the economy does not properly exploit Israel's advantage in this area.[10] The industries that have been left behind are labor-intensive industries that have managed by basing themselves on relatively cheap labor, due to the rapid natural growth in Israel and the use of foreign workers who earn low wages.

The National Economic Council found that there is a shortage of engineers in the economy and that there are obstacles to an increase in their numbers. Various functions are working to resolve the problem. It is important to continue to support the export industries that are human capital- and innovation-intensive, by removing the obstacles to further growth in the supply of employees in the engineering professions that

[10] Israel is ranked third in the OECD in the share of people with higher education.

are relevant to the high technology field. Yet at the same time, it is possible that the more significant potential for improving productivity in the economy is actually in the manufacturing industries that do not export much currently and certainly in nontradable industries such as the construction industry, the commerce industry and the more low technology part of the services industry, the existence of which is dictated by reality. In order to fully utilize their potential, policy must be formulated and implemented to increase the supply of employees with education that is relevant to these industries, encourage the integration of the latest technology[11], and increase their reliance on employees with skills and human capital. In that way, perhaps the lag in the human capital intensity in some of the industries will be narrowed, the worthwhileness of investment in physical capital will increase, and the productivity lag in those industries and in the economy as a whole will decline.

Figure 3
Capital Inventory per Employee, Selected Industries, 1995–2013



[11] An example of such encouragement is the financing provided by the Ministry of the Economy's Chief Scientist for implementing innovative production processes in low technology industries, alongside the encouragement of the research and development of innovation.

Box 2.2
Changes in How the National Accounting System Treats Investment in Research and Development

In August 2013, the Central Bureau of Statistics began to revise the system of National Accounts, in accordance with the recommendations of a new international standard, System of National Accounts 2008. The revisions to date, and which were implemented retroactively for the years 2006–12, increased the level of GDP by 7 percent, on average.[1] The changes carried out in the National Accounts series included, among other things, the inclusion of the value added of financial intermediation services, a change in the method of recording goods imports and exports in accordance with the transfer of ownership of the good,

[1] It should be noted that half of this increase derived from changes that are not connected to System of National Accounts 2008, but to current revisions of the national accounting system. Some of these changes are carried out each year (inclusion of the 2011 Household Expenditures Survey), and some are carried out once every several years (changes in the economy's industry classification, update of figures based on new input-output table and import targets survey). The increase in sources is reflected in growth of uses: there is a marked increase in the Investments section (an increase of 15 percent in Fixed capital formation), and a more moderate increase in private consumption expenditure sections (4.5 percent) and goods and services exports (3.5 percent).

and the addition of central bank output to public consumption. However, one of the major changes is related to including a new series of investment in research and development (R&D) in the Fixed Capital Formation section. This change is the focus of this box.

Considerable research has emphasized the importance of investment in R&D as one of the main sources of economic growth. While neoclassical economic theory viewed technological changes as an exogenous process, and emphasized the accumulation of physical capital as a central factor in economic development, later research emphasized the importance of investment in R&D, and its contribution to creating scientific knowledge and new technology, as a major source of economic growth.[2] It was this development in economic thought, together with the increase in R&D investment as a percentage of GDP, which led to changes in the reference to R&D investment and to the inclusion of its contribution to economic activity in the system of National Accounts.

The previous system of National Accounts viewed expenditure on R&D as an intermediate product, the production cost of which was included together with the other production expenditures of the company. The new recommendations define it as a final expenditure in producing a new product (a type of investment), which increases the value added of the company and thus impacts positively on GDP. In addition, since the National Accounts views expenditure on R&D as a type of investment, this expenditure is included as a new series ("Investment in intellectual property products") in the Fixed Capital Formation item. This change in the definition, and its gradual implementation in the system of National Accounts, has led so far to an average increase of 2 percent per year in the level of GDP, similar to the growth in other countries following this change in classification.[3] However, it is still not clear what the final impact on GDP will be, after additional sections of R&D investment are included, and how large the final increase in GDP will be, compared to that of other countries.

An international comparison indicates that civilian expenditure on R&D, as a percentage of GDP, is higher in Israel than in any other OECD member country, and certainly higher than the OECD average: R&D investment in Israel is 4.5 percent of GDP, while the OECD average is 2 percent. The composition of financing sources is also unusual, as funding comes mainly from the business sector (80 percent)—and half of that comes from abroad (Figure 1), from multinational parent companies holding development centers in Israel. The government finances about 15 percent of R&D expenditure, and the rest is from nonprofit organizations and institutions of higher education. The composition of financing sources markedly impacts the composition of actual expenditure: most expenditure on R&D that the business sector finances is directed to that sector (primarily the R&D industry, the computer services industry, and high technology manufacturing), and government expenditure is directed primarily to the system of higher education and to various government ministries. The share of expenditure directed to the business

[2] See: Griliches (1998), Helpman (1992), Romer (1990). These research studies indicate that an increase of 1 percent in R&D investment increases total factor productivity (TFP) by 0.1–0.3 percent, and the variance in the findings derives from, among other things, different estimation methods and sources of R&D investment data, as well as a different sample of countries and periods. See Nadari (1993), Guellec and Potterie (2001).

[3] The recommendations regarding a change in classification of R&D investment have already been partially implemented in the following countries: Australia (the change led to an increase of 1.5 percent in GDP), Canada (an increase of 1.6 percent in GDP), and the US (an increase of about 2 percent in GDP).

Figure 1
Civilian Expenditure on R&D, by Funding Sector–Israel and Selected Countries, 2010

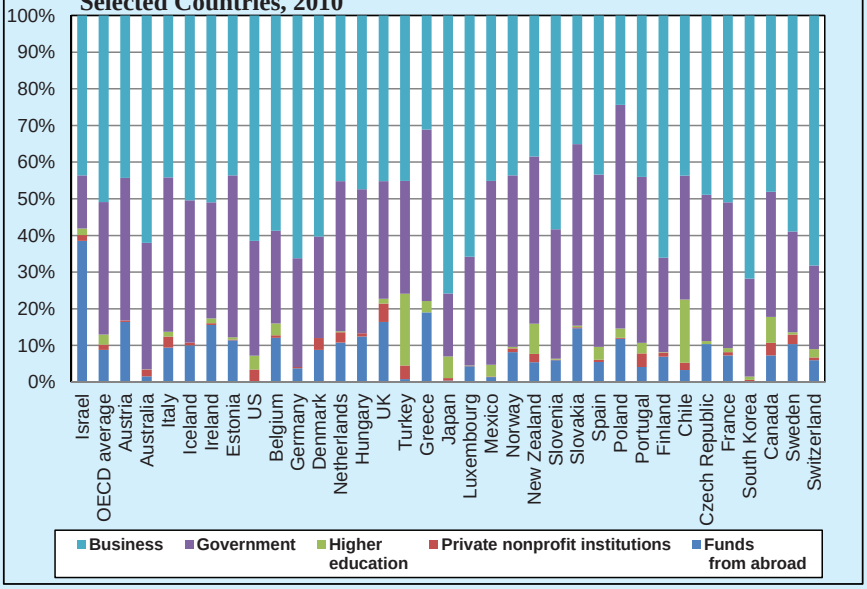
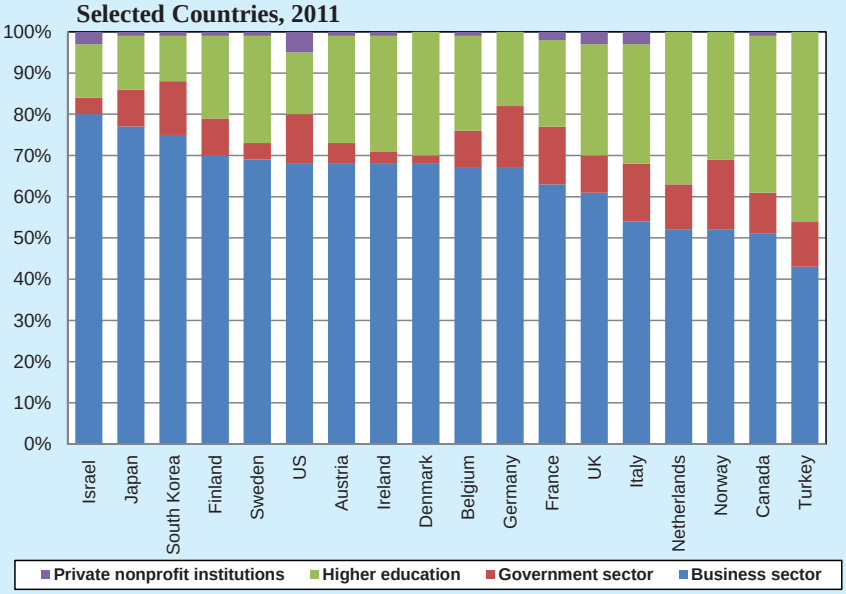


Figure 2
Civilian Expenditure on R&D, by Operating Sector–Israel and Selected Countries, 2011



sector is the highest in the OECD, while the share of expenditure directed to the other sectors are low, in international comparison (Figure 2).

Civilian expenditure on R&D in Israel is about 4.5 percent of GDP—that is, it is considerably higher than the scope of R&D investment that the National Accounts system classified so far as "Investment in intellectual property products". That is because investment in R&D in the National Accounts system still does not include the government's civilian expenditure in R&D. (In the future, it is expected to include the government's defense expenditure in R&D as well.) However, at the same time, a considerable portion of R&D investment in the business sector is made by development centers in Israel, in particular those of multinational companies. This portion is already included in the National Accounts system in services exports data, because the knowledge created in the R&D process does not belong to the economy, but to the foreign companies. In other words, it is a process of exporting R&D services, rather than investment in a domestic asset.[4] It can be derived from this that even though the share of civilian expenditure on R&D in Israel is higher than in all other OECD countries (and it is reasonable to assume that the share of defense expenditure on R&D will also be exceptional), the changes in the National Accounts system are not expected to necessarily increase GDP by a higher rate than in other countries.

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[4] With that, the economic benefit from those development centers should not be minimized. Those centers typically have high value added (the value added per employee post in the R&D and computerization services industry in 2012 was NIS 320,000, compared with NIS 270,000 in manufacturing industries), and they have a high wage per employee post (average wage per employee post in software R&D centers was NIS 28,000, compared with NIS 8,900 for the overall economy in 2012). In addition, there is the indirect economic benefit from those development centers, which derives from knowledge spillovers and the development of the human capital of employees working there.