Chapter 2
GDP, Uses and Principal Industries

- The GDP growth rate in 2010 was higher than the average for the developed economies, and also above that of the previous two years—continuing the trend of emergence from the economic crisis which began in 2009:Q2. Towards the end of 2010 the economy approached full employment, with a significant reduction in the unemployment rate.
- The expansion of economic activity in 2010 reflects the rise in global and domestic demand, and was supported by expansionary monetary policy and slightly expansionary fiscal policy.
- Israel's economic growth stemmed from a marked increase in both exports and domestic uses, and in private consumption in particular.
- An outstanding development in 2010 was the real local-currency appreciation, reflecting not only long-term factors, among them the ongoing surplus on the current account, but also short-term ones, such as the marked expansion of capital inflow.
- The rise in business-sector output was reflected primarily in measured total productivity, incorporating a cyclical element, but also an increase of slightly more than 2.5 percent in factor inputs—capital and labor.
- In the second half of 2010 the expansion of exports moderated, but the continued rise in domestic uses enabled GDP to grow at an even higher rate than in the first half of the year.
- Manufacturing output rose considerably, due to the continued recovery in foreign and domestic demand and despite the decline in the profitability of exports. The expansion of activity in this industry was based on an increase in the utilization of physical capital, while the increase in factor units (physical capital and labor) was modest.
- In response to the continued rise in house prices, there was a surge in the activity of the construction industry in 2010, especially for residential purposes, and the rise in the output of this industry exceeded the average of the business sector, in contrast with the trend of the last decade. The surge was accompanied by a marked increase in the number of persons employed—most of them Israelis—accounting for about one quarter of incremental employment in the business sector. Thus, this industry became an important channel by which the policy adopted since the crisis for stimulating economic activity was expressed.
- The product of the commerce and services industry rose rapidly, as did its labor inputs. The real wage rose moderately in 2010, in contrast with its decline in 2009.
- There are clear-cut economic benefits to having an extensive and efficient public transport system in the metropolitan area. In the last few years, however, because of the competition from private vehicles, its use has declined in intensity. The expansion of this industry involves huge investment in a mass transportation system in the three major cities, the allocation of public transport lanes, and a change in institutional structure enabling better integration between the various aspects of the public transport system.

1. MAIN DEVELOPMENTS AND BACKGROUND CONDITIONS

The trend of emergence from the economic crisis which began in the second half of 2009 persisted in 2010, and at the end of the year the economy approached a situation of full employment alongside a marked decline in the unemployment rate and a rise in the employment rate.

Israel's economy grew by 4.6 percent, exceeding both its potential growth rate[1] and the growth rate of the developed economies. The trend of emergence from the economic crisis, which had begun in the second half of 2009, continued in 2010, and towards the end of the year the economy approached full employment, with a marked decline in the unemployment rate and a rise in the employment rate. Concurrent with the expansion of economic activity there was a rise in the prices of shares and housing, local-currency appreciation, and a slight reduction of the surplus on the current account of the balance of payments. The main reasons for Israel's economic growth in 2010 were the rise in global demand and the stability of Israel's financial system, which was not affected by the crisis. Expansionary macroeconomic policy—particularly in the area of monetary policy, serving to expand domestic demand—also contributed to economic growth.

As was the case in the developed countries, economic growth in Israel stemmed from the marked expansion of exports. In contrast with them, however, domestic uses, and especially private consumption, increased notably.

Expansion was evident in all the principal industries in 2010, especially manufacturing, commerce, financial services, and construction. A comparative analysis in international terms of the composition of GDP growth in 2010 shows that in Israel—as in the developd economies—growth was based on a sharp increase in exports. Unlike them, however, in Israel, domestic uses, and private consumption in particular, also expanded markedly. The rate and composition of GDP growth changed in the course of the year: in the first half it was based—as was the case in the second half of the 2009—on the acceleration of exports and on private consumption, as well as on soaring investment in fixed assets. In the second half of the year the GDP growth

Table 2.1
Indicators of Economic Activity, 1999-2010

(annual rate of volume change, percent)

	1999-2000	2001-2002	2003-2007	2008	2009	2010 Total	2010 First half	2010 Second half
GDP	6.2	-0.3	4.5	4.2	0.8	4.6	5.1	5.6
Per capita GDP in Israel	3.5	-2.5	2.6	2.4	-1.1	2.7	3.3	3.6
Per capita GDP in OECD	3.1	0.7	2.1	-	-4.0	2.5	2.9	2.3
Global per capita GDP	2.8	1.3	3.5	1.7	-1.7	3.6	-	-
Business-sector product	7.4	-1.8	5.5	4.7	0.1	5.3	6.3	6.3
Index of manufacturing output	5.7	-3.4	4.9	7.4	-6.0	7.8	13.5	-3.1
Unemployment rate (percent)	8.9	9.8	9.1	6.0	7.5	6.7	6.7	6.6
Real effective exchange rate	-6.6	5.7	3.1	-10.7	1.8	-5.0	-5.7	-2.9
Gini Index (for net income)	0.35	0.36	0.38	0.39	0.39	0.39	-	-

SOURCE: Based on Central Bureau of Statistics data, IMF.

[1] The potential growth rate of GDP in the last decade is estimated at between 3.6 and 3.8 percent.

rate accelerated, with a continued increase in domestic uses despite the more moderate rise in exports due to the slowdown in world trade.

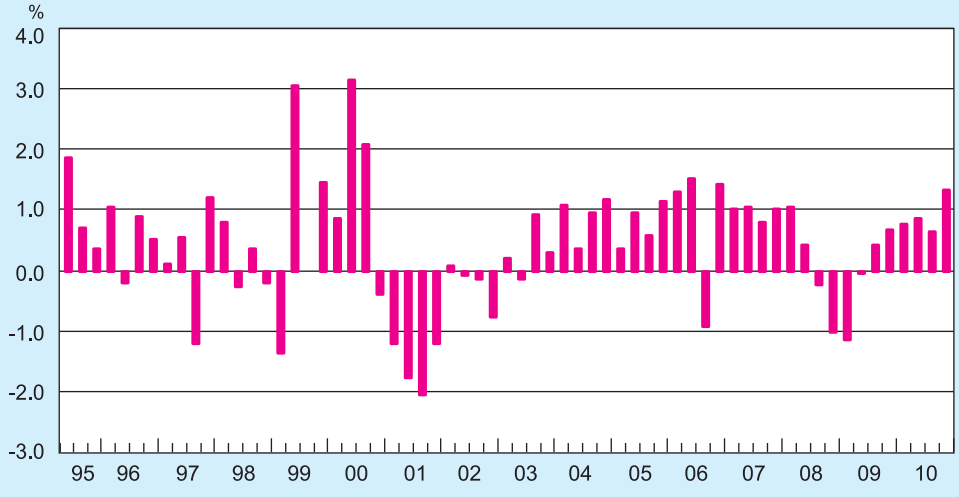
The increase in capital inflow accelerated in the wake of the hike in the Bank of Israel's key interest rate in 2010, which widened the interest-rate differentials between Israel and the US and the eurozone

The expansion of exports irrespective of the real local-currency appreciation is consistent with the assessment that the effect of this factor on Israel's exports in the immediate term is markedly less than that of global demand. Local-currency appreciation in 2010 was above its trend, which expressed the effect of the sustained surplus in the current account, reflected the rise in domestic demand and the increase in short-term capital inflow. The rise in capital inflow accelerated, inter alia, due to the hike in the Bank of Israel's key interest rate this year which served to widen the interest-rate differentials between Israel vis-à-vis the US and the eurozone. The private saving rate declined in Israel in 2010 and private consumption rose. This development expresses, inter alia, the rapid reduction of the unemployment rate in Israel. The surplus on the current account of the balance of payments contracted this year, largely because of the steep rise in the price of imported primary commodities (especially fuel), and the deterioration in the terms of trade. The decline in the surplus on the current account was also expressed in a sharper reduction of the saving rate than of the investment rate.

The recovery of the developed economies stemmed from highly expansionary monetary and fiscal policies, raising doubts about the extent to which the increase in activity can persist once the policy ceases

During the year the assessment was that the pace of recovery of the leading developed economies would be slower and more moderate than in previous crises, due amongst other things to the moderating effect of the fiscal consolidation required in these countries in the short term, and assuming that current private consumption would not rise significantly. The fulfillment of these apprehensions regarding the slow recovery of economic activity in the developed economies and the risk of further moderation of their growth rates could lead to a slowdown in the pace of Israel's

Figure 2.1
Change in Per Capita GDP, 1995–2010
(volume change, quarterly data, seasonally adjusted)



SOURCE: Based on Central Bureau of Statistics data.

economic recovery, especially in the area of exports, which depend on demand in those countries.

a. Global developments

The emergence from the financial crisis which began globally in the second half of 2009 persisted in 2010, and global GDP grew by 4.8 percent. The rate of recovery from the crisis was not uniform in the various countries. Economic growth in the countries of the eurozone was relatively moderate; in the US, where the growth rate was faster, there is still a significant output gap, while in the emerging economies, especially east Asia, where the impact of the crisis was less severe, the growth rate was high. As a result of the heterogeneity of GDP growth, the interest-rate differentials between the main developed economies widened: in the US and the eurozone countries the interest rate remained low, while in the emerging economies, in view of the more rapid growth rate, interest rates were higher. The interest-rate differentials led to an increase in capital inflow to the emerging economies together with the appreciation of their currencies. In some of those countries steps were also taken to purchase foreign exchange, and restrictions on capital flows were sometimes introduced in order to curb appreciation.[2] World trade grew by 12 percent in 2010, but this was not uniform throughout the year: in the first half it rose by 15 percent (annual rate), and in the second half it slowed to 9 percent.

Despite the expansion of economic activity, the recovery of the labor market in the developed economies was slight, so that their unemployment rates continued to be high, averaging about 8.3 percent, and in the eurozone and the US they were even higher—9.9 and 9.7 percent respectively.

The recovery of the developed economies, and the US in particular, relied on highly expansionary monetary and fiscal policy, and this raises questions about the persistence of economic growth once the expansion ceases. Sustained economic growth requires the recovery of private consumption alongside a decline in the private saving rate, but the private saving rate in these economies may actually rise: since the net value of households' wealth relative to their disposable income is lower than its long-term equilibrium value; thus, in order to make future consumption possible individuals will reduce their current consumption and increase their saving rate. The high unemployment rates in these economies, which are expected to persist in 2011, too, will motivate consumers to increase their saving rate for reasons of caution,[3] at the expense of current consumption.

[2] For additional information about intervention in the foreign-currency market, see Box 2.1 in the Bank of Israel's Inflation Report for 2010:IV.

[3] For additional information about the housing market in the leading developed economies, see OECD Economic Outlook (November 2010).

Table 2.2
Global Developments, 2000–2010

(annual and quarterly data)

	1999– 2009 average	2007	2008	2009	2010	2009 I	2009 II	2009 III	2009 IV	2010 I	2010 II	2010 III	2010 IV
	(Annual rate of volume change, percent)												
GDP in Israel[a]	3.6	5.3	4.2	0.8	4.6	-2.8	1.6	3.7	4.9	5.1	5.4	4.6	7.7
GDP in the OECD	1.9	2.7	0.4	-3.5	2.9	-9.0	1.1	2.2	3.6	3.2	3.7	2.5	
GDP of emerging markets[a,b]	6.2	8.7	6.0	2.5	7.1								
Global GDP[a,b]	3.7	5.3	2.8	-0.6	4.8								
World trade[a]	5.2	7.4	2.9	-11.0	11.4	-51.5	14.9	20.8	26.7	-11.2	39.6	8.4	
US imports[a]	3.4	2.7	-2.6	-13.8	12.7	-35.3	-10.6	21.9	4.9	11.2	33.5	16.8	-12.4
CDS premium[c]	78	24	104	156	118	231	164	110	121	120	115	120	118
Dow Jones index	100	126	107	85	101	72	80	90	97	100	98	100	107
Crude oil prices (dollars per barrel)	51	72	100	62	80	43	60	68	76	79	78	76	85
Commodity prices excluding oil (index)	100	134	144	117	139	105	115	121	128	133	138	146	
NIS/$ exchange rate	4.3	4.1	3.6	3.9	3.7	4.1	4.1	3.8	3.8	3.7	3.8	3.8	3.6
NIS/€ exchange rate	5.0	5.6	5.3	5.5	5.0	5.3	5.5	5.5	5.6	5.2	4.8	4.9	4.9

[a] Index.

[b] Basis points.

SOURCE: Based on various sources.

b. Economic policy

Macroeconomic policy in 2010 supported the process of recovery and the entrenchment of economic growth. As was the case in 2009, monetary policy continued to be expansionary. While the Bank of Israel gradually raised its nominal interest rate, so that at the end of the year it stood at 2 percent compared with 1 percent at the beginning, the real interest rate, i.e., adjusted for actual inflation, remained at its low, negative level.

This increase in the nominal interest rate created a differential between the domestic interest rate and the lower rates in the main developed economies. This differential caused a rise in capital inflow and served to augment local-currency appreciation beyond its trend, reflecting the effect on it of the ongoing surplus in the current account. Note that it was necessary to raise the nominal interest rate in Israel in 2010 because of the decline in the unemployment rate, the level of inflation expectations, which were near the upper limit of the inflation target, and the need to moderate the sharp rise in housing prices, which were influenced by the low level of mortgage interest rates, inter alia.[4] In this connection, macrostabilizatory measures were introduced in 2010 in the housing market in order to reduce the banking system's exposure to risks arising from the construction industry.[5]

The use of these two instruments—interest-rate hikes and foreign-currency purchases—creates a complex situation regarding policy, as their effects are not mutually independent, and are even the opposite of one another.

Concurrent with its interest-rate policy, in 2010, too, the Bank of Israel continued with its policy of purchasing foreign currency[6] in order to moderate the trend of real local-currency appreciation. The deployment of these two instruments—interest-rate hikes and foreign-currency purchases—created a complex policy situation, as the two instruments are not independent of one another, and have the opposite effect on economic activity. The combined deployment of the two instruments served to attain two objectives—maintaining price stability and bolstering economic activity, in view of the moderation of the effect of the interest-rate hikes on the exchange rate.

Fiscal policy was slightly expansionary in 2010, and public consumption rose by 3.1 percent, a higher rate than that of the last two years. However, an examination of the budget deficit/GDP ratio shows that it declined, leading to a contraction in the share of the public-sector debt. The decline in the overall deficit in 2010 reflects a rapid rise in direct and indirect tax revenues in view of the relatively rapid economic growth rate, especially considering the very low revenues in 2009.[7]

[4] For further elucidation, see the Bank of Israel's website, the conference held by the Research Department in 2010, the article by F. Dobman, Y. Yakhin, and S. Ribon, "Has a Bubble Developed in House Prices in Israel?" (Hebrew), and the article by V. Nagar and G. Segal, "The Housing Market—Structural Factors in Prices of Owner-Occupied Housing and Rents" (Hebrew). The latter found that the rise in the short-term interest rate accounts for between one and two thirds of the total increase in prices of owner-occupied housing in recent years.

[5] For further information about the instructions and macrostabilizatory measures introduced by the Supervisor of Banks, see Chapter 3 below.

[6] The extent of the purchases declined to about $12 billion in 2010, compared with $19 billion in 2009.

[7] For further information, see Chapter 6 below.

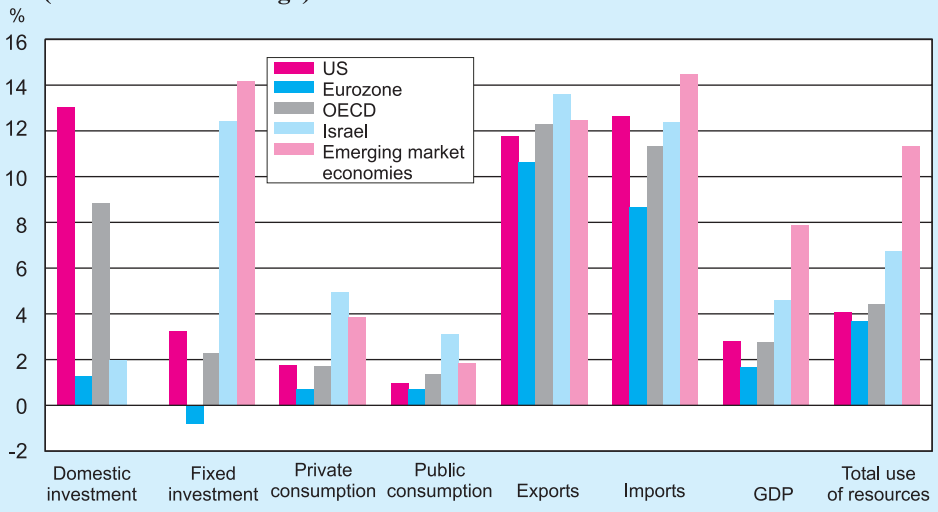
c. International comparisons

In 2010 the resurgence of economic growth was evident in most developed economies, so that on average the rate of GDP growth in the OECD countries was 2.9 percent, after declining by 3.5 percent in 2009. Economic growth in the developing economies was particularly high, reaching about 7.1 percent. In Israel the GDP growth rate was 4.6 percent, after 0.8 percent in 2009. An examination of the per capita GDP growth rate shows that in Israel this was also slightly higher than the level in the developed economies. GDP at current prices reached NIS 813 billion ($ 218 billion), and per capita GDP in purchasing power terms reached $ 28,800, which is 84 percent of the average level in the OECD countries and about 62 percent of per capita GDP in the US. This rate is higher than it was in 2007, before the crisis, when per capita GDP in Israel was 59 percent of that in the US.

The sharp rise in both components of private consumption in Israel—durables purchases and current consumption—exceeded that in almost all the developed countries, contributing over half the GDP growth rate.

An analysis of the changes in uses and imports in Israel compared with the average changes in the developed countries, i.e., the US and the eurozone, as well as with the developing countries, examines the contribution of these components to GDP growth.[8] As can be seen from Figures 2.2 and 2.3, private[9] and public consumption were prominent in 2010 in their steep increase in Israel compared with the rest of its global peer group, while although domestic investment in Israel was higher in 2010,

Figure 2.2
Growth of GDP and Use of Resources in 2010, International Comparison
(volume rate of change)

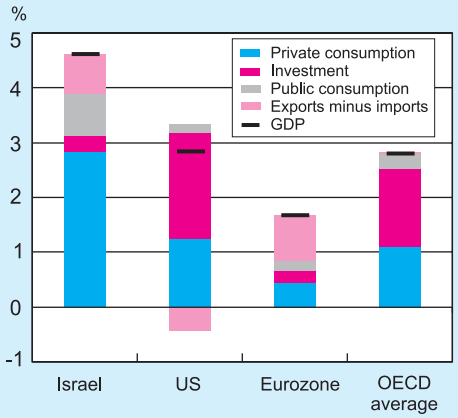


SOURCE: Based on Central Bureau of Statistics and OECD data.

[8] Because of the lack of available data, it was impossible to examine the composition of the contribution of uses to GDP in the group of developing countries chosen (Indonesia, Brazil, South Africa, India, and Russia).

[9] Only in Turkey private consumption rose faster than in Israel, where it rose by 5.3 percent, but its contribution to GDP growth in Turkey was less than that of private consumption to growth in Israel.

Figure 2.3
Contribution of the Use of Resources and the Export Surplus to GDP, 2010



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

it grew at a slower pace than in other countries, mainly because of the steep drop in inventories. On the other hand, fixed investment (excluding inventory) rose more sharply in Israel than it did in either the developed or the developing economies. The steep increase in private consumption in Israel was based on two components—purchases of durables and current consumption—and was higher than that in almost any of the developed countries, accounting for more than half the GDP growth rate (about 2.8 percent). Goods and services exports in Israel expanded by slightly more than the average in the developed countries, and total exports contributed 4.7 percent of Israel's GDP growth, compared with an average contribution of 2.7 percent in the developed economies. However, the export surplus (adjusted for imports) contributed only 0.7 percent to GDP growth in Israel in 2010. The contribution to GDP growth of the rise in public consumption was exceptional this year, constituting 0.7 percent compared with 0.3 percent in the developed economies. However, this increase should also be viewed in comparison with the preceding year, when those countries were obliged to adopt an expansionary policy on the expenditure side because of the crisis, while in Israel the policy was neutral. In the developing countries the expansion of exports was exceptional in 2010, as was that of private consumption and domestic investment. All in all, the increase in total uses in Israel was higher than the average in the developed countries but lower than that in the developing ones.

2. AGGREGATE DEMAND, GDP AND IMPORTS

a. Uses

The growth rate of uses outstripped that of GDP and business-sector product, expressing the increased share of imports in 2010 in the context of the real appreciation.

Total domestic uses rose by 3.8 percent[10] in 2010 as a result of an increase in all their components—private and public consumption, and domestic investment in general, especially fixed assets. Imports and exports of goods and services expanded markedly, by 13.6 and 12.4 percent, after falling sharply in 2009. In sum, uses rose by a notable 6.5 percent, above the rate of expansion of GDP and business-sector product, expressing the increased share of imports in 2010, inter alia in the context of real local-

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

currency appreciation. The real appreciation was led by nominal appreciation,[11] and slightly exceeded in intensity the level required by the long-term exchange-rate trend. It would seem, therefore, that the change in the exchange rate expressed not only the effect of the ongoing surplus in the current account but also short-term factors, which operated with greater intensity in 2010, headed by the closing of the output gap and the increase in short-term capital inflow. The increase in capital inflow this year was affected by the hike in the Bank of Israel's key interest rate, which caused the interest-rate differential between Israel and its principal trading partners to widen.

An examination of the change in uses during the year shows that in the first half of 2010 growth was biased towards consumption and exports, alongside an increase in the other uses, including fixed investment, which had declined in 2009. In the second half of the year the increase in exports moderated, but public and private consumption accelerated, and the marked increase in investment (excluding inventories) continued, so that the expansion of domestic economic activity was greater even than that in the first half of the year.[12]

Table 2.3
Sources and Uses, 1999-2009

(volume rates of change, percent)

	1999-2000	2001-2002	2003-2007	2008	2009	2010		
						Total	First half	Second half
GDP	6.2	-0.3	4.5	4.2	0.8	4.6	5.1	5.6
Business sector product	7.4	-1.8	5.5	4.7	0.1	5.3	6.3	6.3
Imports	13.7	-3.1	5.8	2.4	-14.1	12.4	14.9	4.8
of which: Imports excluding diamonds	12.2	-4.1	6.9	6.2	-12.5	9.3	11.3	4.9
Total sources	8.4	-1.2	4.9	3.7	-3.7	6.7	7.8	5.4
Exports	18.4	-6.6	9.0	5.9	-12.5	13.6	17.1	7.9
of which Excluding diamonds	18.8	-8.0	10.9	11.3	-10.0	10.9	14.1	5.8
Gross domestic investment	4.2	-7.0	5.9	2.4	-8.9	1.9	21.4	-2.8
of which fixed asset investment	1.7	-5.1	5.6	3.9	-5.8	12.4	13.0	19.7
Private consumption	6.4	2.2	3.8	3.0	1.7	4.9	4.0	3.9
of which Excluding durables	5.5	3.0	3.5	1.8	2.6	4.2	4.0	3.1
Public consumption	2.2	4.3	0.7	2.6	2.5	3.1	1.4	6.4
Domestic uses	4.8	0.7	3.4	3.1	0.2	3.8	5.7	2.7

SOURCE: Based on Central Bureau of Statistics data.

[11] The nominal effective exchange rate, calculated as the weighted average of the exchange rate of the shekel against 28 currencies according to their share in Israel's trade with those countries, appreciated by 7.1 percent in the course of 2010.

[12] Since the emergence from the economic crisis was in the second half of 2009, in both halves of 2010 the annual average growth rate for 2010 as a whole was lower than that of 2009.

Table 2.4
Developments during the Year, 2009 and 2010

(seasonally adjusted, change from previous quarter in annual terms)

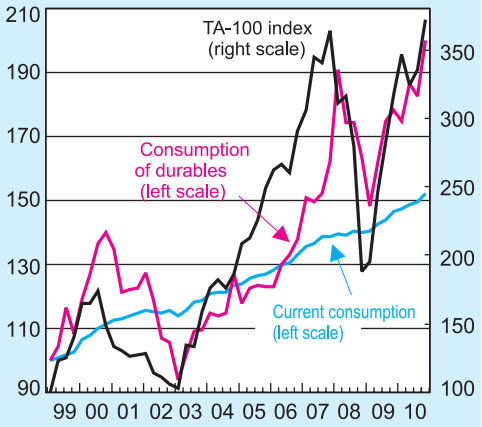
	2009				2010			
	I	II	III	IV	I	II	III	IV
GDP	-2.8	1.5	3.7	4.9	5.1	5.4	4.6	7.7
Business sector product	-4.9	2.1	3.5	5.0	6.8	6.6	4.8	9.1
Imports	-37.8	7.3	15.9	16.7	17.6	8.0	-0.4	12.7
of which: Excluding diamonds	-38.4	1.5	9.1	12.0	9.9	13.3	-0.7	8.5
Total sources	-13.8	1.5	5.1	6.7	6.3	7.5	3.2	7.9
Exports	-31.0	-2.8	14.9	45.4	5.3	17.4	2.4	10.4
of which: Excluding diamonds	-32.5	-4.8	10.8	33.9	3.2	19.3	0.7	3.7
Gross domestic investment	-14.1	-20.0	-1.9	-39.1	109.9	-18.1	-0.3	9.7
of which: Fixed asset investment	-13.6	-0.1	3.1	-7.1	19.5	22.8	20.2	15.7
Private consumption	-2.2	9.2	6.3	8.0	0.9	6.3	0.7	8.0
of which: Excluding durables	1.4	6.5	3.7	7.9	2.3	3.8	1.8	4.9
Public consumption	3.3	6.0	-2.4	0.8	2.4	0.1	9.7	6.6
Domestic uses	-2.2	1.6	4.3	-3.9	14.6	-1.2	2.3	7.5

SOURCE: Based on Central Bureau of Statistics data.

The decline in Israel's unemployment rate, in contrast with the situation in the developed economies, enabled consumption to rise faster, alongside a steep reduction in the private saving rate.

Private consumption grew by 4.9 percent in 2010, a higher rate than in previous years, and includes a 4.2 percent increase in consumption excluding consumer durables expressing a rise in per capita consumption. The increase in disposable income—the result of economic expansion and its concomitant increase in employment, the real interest rate, which continued to be low, and the steep and cumulative rise in share prices in the last two years, increasing the value of the public's net financial wealth—contributed to the rise in private consumption in 2010, both in its pro-cyclical stage, expressed in the consumption of consumer goods, and in current consumption (Figure 2.4). The decline in the unemployment rate in Israel, in contrast to the situation in the developed countries, particularly the US and many of the eurozone countries, enabled consumption in Israel to expand significantly more than in the developed economies, together with a decline in the private saving rate.

Figure 2.4
Private Consumption (index) and the Tel Aviv 100 Share Price Index, 1999-2010 (1999:Q1 = 100)



SOURCE: Based on Central Bureau of Statistics data.

The quantitative expansion of imports of durable goods in the first half of 2010, despite the rise in import prices, is explained not only by the rise in the public's wealth but also by the increased viability of purchasing such goods in the wake of the sharp real local-currency appreciation, especially in 2010:IV, when purchases of passenger cars increased.

Exports expanded by 13.6 percent in 2010, and excluding diamonds by 10.9 percent, less than world trade, which rose by 12.3 percent. This increase, after the contraction of almost 10 percent in nondiamond exports in 2009, focused mainly on exports of goods (especially of manufactured goods) and tourism services, while exports of the other services rose only moderately.[13] Tourism exports expanded by 34.2 percent. This rate reflects an increase in the number of tourists entering Israel, which reached a record 3.4 million, after declining in 2009 due to the fighting in Gaza at the beginning of the year. The main reason for the increase in exports in 2010, as well as for their slower rise later on in the year, was world trade, which rose sharply in 2010 but slowed later on in the year. In the wake of the economic crisis some exporters began to divert trade to emerging markets, which were expanding rapidly and were less exposed to the crisis. This trend helped to reduce the adverse effect on exports of the more moderate growth rate of the countries of the eurozone and the US.[14] With regard to the deterioration in the terms of trade—the rise in the price of imported inputs and the real local-currency appreciation in 2010 should have served to reduce exports, but it seems that their immediate effect was slight. This assumption is in line with estimations regarding the low sensitivity of quantitative exports to the real exchange rate,[15] as well as with the finding that the terms of trade and the real exchange rate affect manufactured exports only with a lag of about one year.[16] Thus, the effect of the exchange rate on exports may be small, as it mainly affects industries which are not high-tech-intensive and have a low profit margin,[17] but even this effect is not immediate due to previous contractual commitments. As regards the composition of manufactured exports, the sharp increases in the chemicals and medications industries were prominent this year, especially in its first half, while the exports of the electronics industries rose relatively moderately. Despite the slowdown in the expansion of exports in the first half of 2010 as result of the slower increase in world trade, Israel's exports in 2010 reached a level that was slightly higher than that of 2008, compensating for the decline recorded in 2009.

The main reason for the expansion of exports in 2010, as well as for the slower increase later on in the year, was world trade, which rose steeply this year but slowed later on.

Despite the slowdown in the expansion of exports in the second half of 2010 due to the slower growth of world trade, in 2010 exports reached a level slightly above that of 2008.

Gross domestic investment rose by 1.9 percent in 2010 due to the 12.4 percent increase in fixed investment and the sharp decline in the change in goods inventories.

[13] The reason for this moderate rate may be the fact that the increase in global trade in services was smaller than it was in goods.

[14] For further elucidation of this subject, see the section on exports in Chapter 7 below.

[15] See box 2.3 in Bank of Israel, Annual Report for 2008. These estimations may be biased in view of the problem of simultaneity between the real exchange rate and exports.

[16] For more details on this subject, see the section on manufacturing later in this chapter.

[17] Y. Sofer (2005), "Measuring the Real Exchange Rate and its Effects on Imports and Exports," Bank of Israel, Foreign Currency Review, 2005.1 (Hebrew).

In contrast with 2009, all the components of investment in the principal industries rose in 2010. Investment in machinery and equipment and in transport vehicles grew, and that in nonresidential construction rose slightly after declining for two years.

The increase in fixed investment comprises the expansion of investment in the principal industries and in housing at similar rates (12.7 and 11.7 percent respectively), continuing the acceleration of investment in construction in the last three years. In 2010, in contrast with 2009, all the components of investment in the principal industries rose: investment in machinery and equipment expanded by 9 percent, investment in transport vehicles grew by 29.7 percent, and investment in nonresidential construction rose slightly after declining for two years. Investment in intangibles (software and prospecting for gas and oil) rose by 20 percent, after increasing by 7 percent in 2009. This rise constitutes another stage in the acceleration of economic activity after the emergence from the economic crisis in mid-2009: at first capacity utilization expanded,[18] and only in 2010, once it became clear that the increase in economic activity would persist, did firms decide to expand their capital stock by increasing investment. As stated, the increase in investment was not confined to the construction industry in the context of the low real interest rate, which served to accelerate demand in that industry, but was also evident in investment associated with increased productivity (investment in machinery and equipment and software), continuing the long-term trend of increasing its share in total investment.[19] It is reasonable to assume that the timing of investment in these components, which are import-intensive, was also affected by the real local-currency appreciation which prevailed in 2010. In contrast with this category of investment, the decline in infrastructure investment[20] was notable this year, down by 8 percent from 2009, continuing the 1.2 percentage-point reduction of its share in GDP since 2003. The expansion of investment encompassed the main industries of the business sector (services, manufacturing, and construction), so that total business-sector investment rose by 6 percent in 2010, after declining by 10.6 percent in 2009. While the level of business-sector investment remained slightly below its long-term level in 2010, the gap has narrowed with the recovery of economic activity and the decline in capital costs. This was expressed in the decline in the relative price of investment (relative to the GDP deflator), most of which is imported, the decline in the corporate tax rate, and the high level of return on equity.[21] The sharp drop in the change in inventory in 2010, which is added to its decline in 2009, is surprising at first glance in view of the entrenchment of economic growth and the low interest rate, which indicate the low cost of maintaining inventory. The recovery of economic activity and the rapid shift towards closing the output gap—in contrast with the slow recovery from previous recessions—may have taken firms by surprise, requiring them to reduce inventories

[18] See, for example, the rise in equipment utilization in manufacturing which began in 2009:II, according to the findings of the Companies Survey.

[19] The correlation between the share of investment in machinery and equipment and software in total business investment, on the one hand, and the change in total productivity in this sector, on the other, is positive and significant over time.

[20] Infrastructure investment includes investment in energy, water, transport, and communications, see Appendix table 2-A-28.

[21] For further elucidation, see Y. Lavi and Y. Menashe (2010), "The Long- and Short-Term Relations Affecting Investment in Israel's Business Sector, 1968-2008" (Hebrew). Research Department, Bank of Israel, *Discussion Paper* 2010.06.

in order to meet demand.[22] This explanation is borne out by data on manufacturing in the *Companies Survey*: since the emergence from the economic crisis, in mid-2009, and throughout 2010, companies reported in each quarter that their activity and actual sales were higher than expected and as reported in the preceding quarter.[23]

Public consumption increased by 3.1 percent in 2010, a faster annual rate of increase than that of the last few years. General government consumption, which does not include defense imports, rose by a more moderate 2.8 percent. Bearing in mind the fact that this rate of growth of general government consumption is greater than that of population growth, and that the share of public consumption in GDP remained almost unchanged relative to 2009,[24] expenditure policy can be described as slightly expansionary. Despite this expansionary policy on the expenditure side, there was a decline in the overall deficit in 2010, and even in the cyclically-adjusted deficit, leading to a 1 percentage-point reduction in the public-sector debt. However, the reduction of the deficit in 2010 reflected a high cyclical increase in tax revenues as a result of the relatively rapid rate of economic expansion, and especially the low level of revenue in 2009. In retrospect, too, the decline in Israel's deficit in the years before the economic crisis may have been cyclical to some extent.

Public consumption rose by 3.1 percent in 2010, above the annual growth rate of this item in recent years.

b. Sources

(i) Imports

Imports rose by a steep 12.4 percent in 2010, exceeding the 6.5 percent increase in total uses. The development of the change in imports was not uniform throughout the year: most of the rise occurred in the first half and the last quarter, when there was real local-currency appreciation; the appreciation increased the viability of buying imported consumer durables, serving to reduce the relative price of investment, and thereby stimulating purchases of imported investment equipment. The rise in the price of imported raw materials—and fuel first and foremost—which are production and import intermediates, did not lead to a quantitative reduction of their imports. This may express the rigidity of demand for these production inputs, because their quantity is determined by the demand for exports, and this is affected by the expansion of world trade rather than by price. In the second half of 2010, with the more moderate increase in world trade, the rise in goods imports also slowed. Services imports, especially

The development of the change in imports was not uniform during 2010: most of the increase occurred in the first half and last quarter of the year, when there was real local-currency appreciation.

[22] The idea that goods inventories were used to meet firms' unexpected demand was examined by S. Ribon (2006), "Changes in Inventories, Business Cycles, and Financial Limitations—an Analysis Using Data from the Companies Survey" (Hebrew). Research Department, Bank of Israel, *Discussion Paper* 2006.08. This empirical analysis, which focused on manufacturing in Israel, found that there is a positive relation between an unexpected change in sales in manufacturing and inventory change.

[23] Net balances (the difference between the proportion of companies reporting an increase in activity and those reporting a decline) in manufacturing were greater than the order data (expectations) in the preceding quarter for both exports and domestic sales.

[24] This share is measured in current prices, and prices of defense consumption rose faster than the GDP deflator.

by Israelis abroad, also increased in 2010 in the context of the recovery of economic activity and local-currency appreciation against the dollar and the euro, which reduced the cost of vacations abroad. In conclusion, the level of civilian goods imports in the second half of 2010 was close to its level in the second half of 2008.

(ii) Supply of business-sector product

Business-sector product grew by 5.3 percent, above the annual average growth rate in 2000-2008.

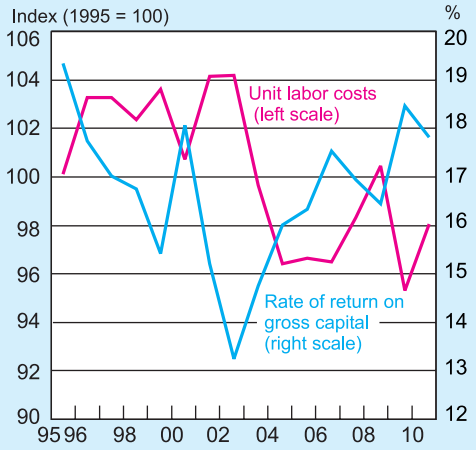
Business-sector product expanded by 5.3 percent, after stagnating in 2009, and exceeded its annual average growth rate in 2000-2008, which was 4.5 percent. Business capital stock at the beginning of 2010 rose by about 3.3 percent, and labor input rose by 2.8 percent, inter alia due to the greater share of persons in part-time employment.[25] Total productivity in the business sector, measured by the Solow Residual, rose by 2.3 percent, above its average long-term trend of only 1 percent.[26]

Assuming that in mid-2008 there was full production capacity, it would appear that in 2010 the economy approached full employment, and that the output gap was almost closed at the end of the year.

Part of the rise in measured productivity may be cyclical, reflecting the increase in the utilization of capital and labor, also expressed in the high rate of utilization of manufacturing equipment according to the Bank of Israel's *Companies Survey* for 2010:IV. This finding is consistent with the assessment that only towards the end of 2010 was there progress towards closing the output gap, and that a situation of full employment, in which economic growth is based primarily on a rise in factor inputs (capital and labor) rather than on an increase in measured total productivity, has not yet been reached.

According to an examination of the labor supply, the civilian labor force rose by 1.8 percent, similar to the population growth rate but slightly below its average growth rate in the last decade and in the years before the economic crisis. This increase in the labor force reflected the rise in the participation rate (especially among women) which, together with a sharper rise in demand, led to a marked decline in the unemployment rate. Unit labor cost in the business sector rose by 2.2 percent, after plummeting by 5.1 percent in 2009. This increase, which signifies that real hourly labor costs (producers' labor cost) rose by more than the real increase in labor productivity (at factor cost), is not surprising considering the expansion of demand and economic

Figure 2.5
Rate of Return on Gross Capital and Unit Labor Costs, 1995-2010



SOURCE: Based on Central Bureau of Statistics data.

[25] For a more detailed account of this subject, see Chapter 5, The Labor Market.

[26] For further elucidation, see Box 2.1, "The Change in Total Productivity: Technological Advances or Pro-Cyclical Factors?" in Bank of Israel, *Annual Report*, 2008.

activity. However, even after this increase the level of average labor costs in 2010 was lower than it has been in recent years, especially in 2008 when there was full employment in Israel (Figure 2.5). The decline in the return to capital is reflected in the decline in the rates of return on it: the return on gross capital fell slightly, to 18 percent, compared with 18.4 percent in 2009. A long-term perspective shows that this rate is higher than in the past, and this is in line with the assessment that investment in the business sector is still below its long-term trend, so that it is possible to increase the reservoir of capital in this sector.[27]

Table 2.5
Supply of Business Sector Product, 1999-2010

(volume change, percent)

	1999-2000	2001-2002	2003-2007	2008	2009	2010		
						Total	First half[a]	Second half[a]
Business sector product	7.4	-1.8	5.5	4.7	0.1	5.3	6.3	6.3
Gross capital stock	7.2	3.6	3.1	5.2	4.8	3.3	3.4	3.7
Labor input	4.1	-0.3	2.6	4.4	0.2	2.8	0.4	5.6
Total factor productivity	2.3	-3.3	2.7	0.1	-1.5	2.3	4.2	0.2
Civilian labor force plus foreign workers	4.0	1.1	2.1	2.7	2.1	1.8	0.6	6.0
Gross product per man-hour (nominal)	6.9	0.1	3.8	0.6	5.1	1.1	4.2	3.9
Compensation per man-hour (nominal)	7.0	1.7	2.7	2.9	-0.1	4.0	-	-
Rate of labor compensation in business sector (%)	71.0	72.8	68.0	70.3	66.8	68.8	-	-
Rate of return on gross capital (%)	16.7	14.2	16.3	16.4	18.4	17.8	-	-
Capital/labor ratio	3.2	5.7	0.2	0.7	4.8	0.2	-0.1	-1.5
Gross capital stock/GDP ratio	1.4	1.6	1.7	1.6	1.7	1.6	1.7	1.7
Bank of Israel's published nominal rate of interest	10.7	6.8	4.9	3.7	0.8	1.6	1.4	1.8
Interest on overdraft facilities	17.4	13.5	10.9	9.8	8.0	9.2	9.0	9.5
12-month forward inflation expectations (%)	3.3	1.9	1.7	1.9	1.8	2.9	2.8	3.0
Real yield on 10-year bonds (%)	5.3	5.0	4.0	3.4	2.6	2.0	2.3	1.6
Corporate tax rate (%)	36.0	36.0	33.0	27.0	26.0	25.0	25.0	25.0
Tax on non-wage income (%)	23.3	25.4	23.8	28.0	23.1	19.1	-	-

SOURCE: Based on Central Bureau of Statistics data.

[27] A similar picture is obtained by observing the rate of return on net capital. However, the relevant figure for investment decisions is the marginal rate of return on capital rather than the average rate. Estimating this rate is problematic, but in view of the decline in the average rate of return on capital it is possible to assess that the marginal rate of return on gross capital also declined in 2010, and that it was even below the average.

The decline in the corporate tax rate and expectations of its further decline in the coming years appears to have also bolstered the increase in investment. Although an examination of credit extended to the business sector indicates that it rose at a moderate rate after declining in 2009, this is not enough to signal a supply-side problem, as firms do not have a problem gaining access to bank and non-bank credit, and according to the *Companies Survey* there was a decline in financing constraints in the business sector in 2010. It would seem, therefore, that companies financed their credit requirements from their own sources and from credit arrangements among themselves.[28]

3. THE OUTPUT GAP AND THE REAL EXCHANGE RATE

The measured output gap, which is the difference between the economy's potential productive capacity (the long-term supply side) and actual demand, contracted in 2010 as a result of the marked increase in both domestic and foreign demand, reflected in the decline in the unemployment rate. In the developed economies, however, and particularly those of the eurozone and the US, economic growth was slower, so that their output gaps remained negative and their unemployment rates higher. As Figure 2.6 shows, there are several ways of measuring the output gap in Israel:

1. The production function method: this measures the gap in the business sector as the sum of the deviations of factor inputs and productivity from their long-term trends (taking the utilization factor into account).[29]

2. The SVAR method: this estimates the relation between business-sector product and unemployment incorporating lags, and separating demand shocks from supply shocks by imposing the assumption that demand shocks have an effect in the short term only.[30]

3. The NAIRU method: this estimates the relation between the domestic output gap and inflationary pressures.[31]

All three methods yield a similar picture of the shift in the output gap, but differ in their reply as to whether it was closed in 2010. The first two methods show that the output gap was negative this year, but declined by 1.5 percent from its 4 percent level in 2009. According to the NAIRU method, however, inflationary pressures are already at work in Israel as the domestic output gap is positive and came to over 2.5 percent in 2010.[32] Assuming that in mid-2008 there was full utilization of production

[28] See additional discussion of this subject in Chapter 4 below.

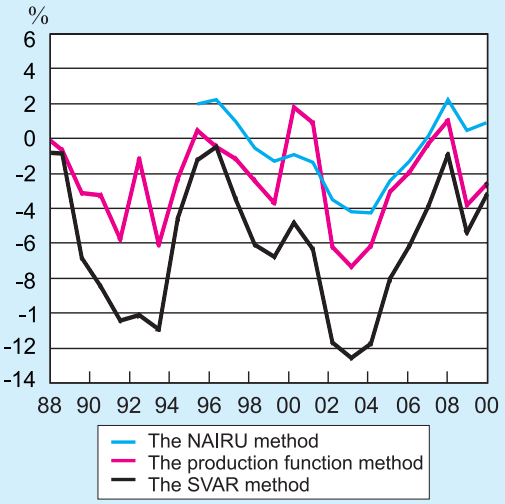
[29] Y.Menashe. & Y.Yakhin (2005). "Mind the Gap: Structural and Nonstructural Approaches to Estimating Israel's Output Gap", Israel Economic Review, no.2.

[30] Ibid.

[31] T. Sukhoy and A. Friedman (2004), "Estimating the NAIRU in Israel as an Unexpected Variable," Bank of Israel, *Economic Review*, no. 76.

[32] According to this method the growth rate of potential GDP slowed to about 3 percent in the last economic crisis, compared with 3.6 percent beforehand, so that given the rapid growth rate of GDP the output gap is already positive.

Figure 2.6
The Output Gap Using Different Methods of Calculation, 1988-2010



SOURCE: Based on Central Bureau of Statistics data.

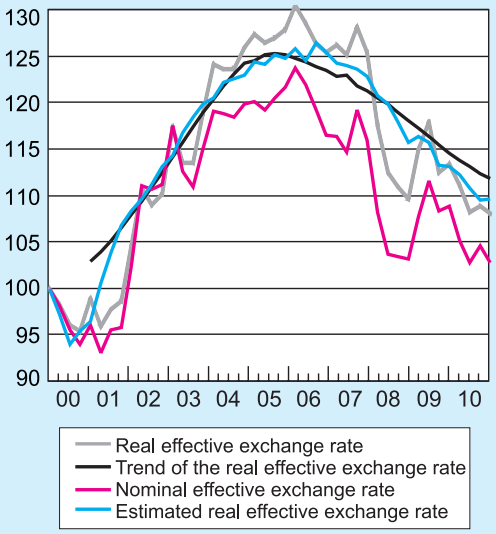
capacity—and not excess capacity (a positive output gap), as is indicated by the output gap as measured by the production function method—it appears that Israel approached full employment in 2010, and that at the end of the year the output gap was nearly closed.

Additional data bear out the assessment that Israel approached full employment in 2010; these include the moderate increase in labor cost and data on constraints reported in the Bank of Israel's *Companies Survey*, according to which during 2010 the severity of demand constraints declined in all the industries of the business sector, so that the gap between their severity and that of the supply constraints approached the low level recorded at the end of the first half of 2008, before the economic crisis. Thus, it can be said that even if there were no inflationary pressures in Israel in 2010 and most of the price rises were concentrated in those of assets—and housing in particular—it would seem that towards the end of the year the forces operating to increase wages and prices intensified. Consequently, it is reasonable to assume that continued economic growth in the future will also lead to inflationary pressures on the production costs side.

The fact that Israel was getting closer to closing the output gap in 2010 and that the unemployment rate was falling—in contrast, as stated earlier, with the situation in most of the developed countries—also served to cause effective real local-currency appreciation,[33] which went down by 5 percent on average, after slight depreciation in 2009. Additional indicators representing the real exchange rate also attested to real appreciation; these included the ratio between export and product prices, which dipped by 2.1 percent, as well as the differences between the increase in the output prices of the nontradable industries such as housing and the public services, which went up by 4.5 and 3.3 percent respectively, and those of the tradable industries, which hardly changed at all. These differences may express productivity differences between the two sectors (the Balassa-Samuelson effect, see Box 2.1). An examination of the exchange rate vis-à-vis the (estimated) equilibrium exchange rate, which is the rate obtained from estimating the effect of fundamentals on it—per capita output gaps between

[33] The effective real exchange rate is defined as the effective nominal exchange rate adjusted for the level of prices in Israel relative to that of its principal trading partners.

Figure 2.7
The Effective Exchange Rate (2000:Q1 = 100), 2000-10



SOURCE: Based on Central Bureau of Statistics data.

Israel and the US and the terms of trade—shows that appreciation beyond these fundamentals was only 1.5 percent in 2010 (Figure 2.7). An alternative examination of appreciation beyond its long-term trend shows that it reached 3.5 percent in 2010.[34] In other words, the appreciation reflected primarily long-term factors, such as the continued surplus on the current account, but also short-term ones, such as the marked increase in capital inflow in the wake of the hike in the Bank of Israel's key interest rate in 2010, which created a differential between the domestic interest rate and those in the US and the eurozone.

4. SAVING, INVESTMENT, AND THE CURRENT ACCOUNT

The surplus on the current account contracted in 2010 and reached 3 percent of total national income,[35] compared with 3.8 percent in 2009. An analysis of the current-account surplus according to the differential between savings and investment shows that the reduction of the surplus reflects a 1.6 percentage-point decline in the national saving rate, which was partly offset by the 0.8 percentage-point decline in the share of the domestic investment rate in total national income.

The gross national saving rate fell to 18 percent of total income in 2010, compared with 20 percent in 2009.

The gross national saving rate declined by 18.4 percent as a share of total national income in 2010, compared with 20 percent in 2009—the result of the sharper decline in the private saving rate, which was moderated slightly by the 1.4 percentage-point rise in public saving. This decline in private saving is explained by two main factors: 1. The abatement of the uncertainty which prevailed in 2009 regarding the impact of the global economic crisis on Israel, and the rapid adjustment of the public's asset

[34] The trend was calculated by spectral decomposition of the real exchange rate and adjusting for the cyclical element by a Baxter and King filter, as well as for seasonal factors. The method which estimates the real long-term equilibrium exchange rate is based on the study by Eckstein and Friedman (2011) '"The Equilibrium Real Exchange Rate for Israel," using two methods. The sample period was 1995:I – 2010:IV.

[35] National income is defined as GNP plus transfers from abroad to individuals, and transfers to the public sector *less* interest payments abroad.

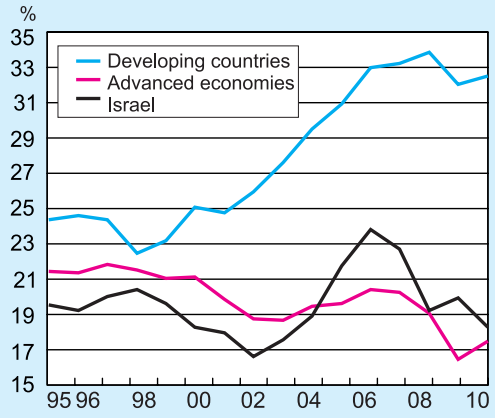
portfolio, which was eroded during the crisis, caused individuals to draw down their savings, which had risen in 2009 largely for reasons of caution. 2. The steep increase in purchases of durable goods in 2010—due to the rise in the value of the public's wealth, which was reflected by the increase in share prices, as well as to the greater viability of these purchases due to the local-currency appreciation—was expressed in the marked rise in private consumption at the expense of private saving.[36] The deterioration in the terms of trade in 2010 may also have been perceived by individuals as having only a temporary adverse effect on income, so that they preferred to reduce present savings and thereby smooth shocks to their consumption.

A comparison between the private saving rate in 2010 and those of previous years shows that its decline restored it to its average long-term rate—after its exceptional rise in 2009, against the backdrop of the decline in purchases of durables and apprehensions regarding the repercussions of the global economic crisis for Israel. By international standards the private saving rate in Israel is slightly higher than the average in the developed economies and significantly lower than in the emerging economies[37] (Figure 2.8).

The proportion of fixed investment in GDP was low both relative to the past in Israel and in comparison with the average in the developed countries.

As a share of total national income the gross investment rate declined by 15.4 percent in 2010, after falling by 16.2 percent in 2009. This steep drop reflects the drastic reduction in the stock of finished products (mainly in the second half of the year). However, an examination of the rate of fixed investment (excluding inventories) shows that it was lower than in the past in Israel, as well as than the average in the advanced economies. Decomposition of the gap in the investment rate between Israel and the advanced economies to the quantitative component (the difference in the rate of fixed investment, at constant prices) and the component of the relative price of investment (the difference in the price of the investment *divided by* the GDP deflator) shows that from the beginning of the decade until Israel emerged from the recession in 2005 most of the gap was due to the quantitative element (Figure 2.9). This component reflects the downwards adjustment of the reservoir of capital in Israel during the recession at the beginning of the decade.

Figure 2.8
Savings as Share of GDP, 1995-2010



SOURCE: Based on Central Bureau of Statistics data.

On the other hand, the component of the relative price, which is quite

[36] Note, however, that the private saving rate adjusted for purchases of durable goods and imputing these products' services over time declined by 2.5 percentage points—see Appendix Table 8.

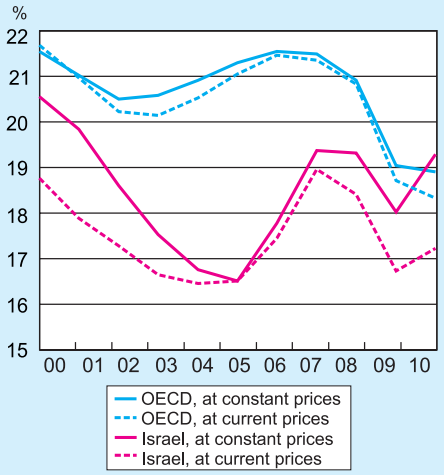
[37] An examination of the saving rates between 1995 and 2010 shows that throughout this period the saving rate in Israel was significantly higher than that in the US, but slightly lower in the last fe years than in the eurozone.

small in extent, served to reduce the gap between the investment rate in Israel and that in the advanced economies, reflected in the increase in the relative price of investment (part of which is imported) in Israel due to the real local-currency depreciation at that time (Figure 2.10).[38]

Most of the differential in investment rates between Israel and the developed countries in 2010 derived from the relative price component, and primarily the real local-currency appreciation.

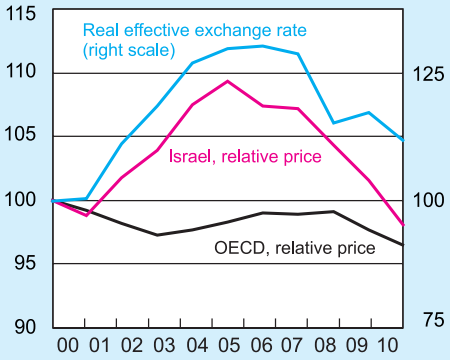
Since 2006, when there was effective real local-currency appreciation, the reduction of the relative price has accelerated, serving to widen the gap in the rate of investment between Israel and the advanced economies. This price effect became dominant in 2010, and in actual fact most of the gap in the investment rate between Israel and the developed countries stemmed from the relative price component, i.e., appreciation.[39] Thus, the real local-currency appreciation acted to reduce the investment rate, on the one hand (as the value of the investment declines with appreciation), thereby increasing the current-account surplus,[40] but also to reduce the private saving rate by stimulating the import of consumer durables, on the other, and thereby reducing the current-account surplus.

Figure 2.9
Fixed Investment as Share in GDP in Israel and the OECD, 2000-10



SOURCE: Based on IMF and Central Bureau of Statistics data.

Figure 2.10
Indices of the Relative Price of Fixed Investment in Israel and the OECD, and the Real Effective Exchange Rate, 2000-10
Index (2000 = 100)



SOURCE: Based on IMF and Central Bureau of Statistics data.

[38] Due to the lack of data on investment in specific sectors in all the advanced economies, the breakdown is of the rate of fixed investment as a percentage of GDP.

[39] The rate of fixed investment as a percentage of GDP in Israel and the developed countries was identical in 2010, and a large part of this result is connected with the decline in the investment rate in the principal industries in the developed economies, and apparently also in housing, in the wake of the recent crisis.

[40] This is the accounting effect of appreciation and the decline in the relative price which acts to reduce the value of investments, but there is also the opposite effect by which appreciation reduces the cost of buying imported equipment, thereby making it more viable and hence operating to increase investment in quantitative terms. The latter effect may also be expressed with a lag, see Lavi and Menashe (2010).

Box 2.1

An examination of the correlation between relative productivity and the real exchange rate over time

• The expansion of the tradable goods sector relative to that of nontradables in the US in 1986-2009 outstripped the pace of development of this ratio in Israel, and this trend was accompanied by depreciation of the shekel against the dollar.

• In this box we examine whether one of the forces behind the development of the real exchange rate is the development of the productivity of the tradable goods sector in relation to that of the nontradable ones in Israel relative to the US.

• We find that there is indeed a correlation between relative productivity and the real exchange rate in the years examined, in accordance with the assumptions of the Balassa-Samuelson model.

• We also find that the per worker GDP growth rate in the tradables sector in the period reviewed was greater than that in the nontradables sector, and that the level of output per worker in the tradables sector at the beginning of the period was lower than it was in the nontradables sector—in both Israel and the US.

The real exchange rate between the two countries, defined as the nominal exchange rate adjusted for the two inflation rates, reflects the value of a specific basket of goods (generally that of the CPI) in one country relative to its value in the other. The volatility of the real exchange rate and its implications for the balance of payments has led to the development of an extensive economics literature that attempts to explain the basic factors determining exchange-rate developments over time, as well as to isolate these factors from short-term influences which temporarily divert the exchange rate from its long-term trend. Most of these theories distinguish between prices of tradables and those of nontradables because empirical findings[1] have shown that the greater the level of tradability of a product the higher will be the similarity of its value between countries, in accordance with the theory of PPP (Purchasing Power Parity).

According to one of the main theories in this field, that of Balassa-Samuelson, long-term changes in the real exchange rate stem from the development of the relative productivity in the tradable and nontradable sectors in one country relative to that in another. The explanation for this is intuitive: if a rise in productivity in the tradables sector is greater than that in the nontradables sector upward pressure will be exerted on wages in the tradables sector; this pressure will lead workers to move to this sector, reducing the relative supply of labor in the nontradables sector, and raising the relative price of its products. Hence, if the rise of the relative productivity of the sectors is greater in one country than in another, the relative price of its nontradable to tradable products will rise by more than that in the other country. Assuming that

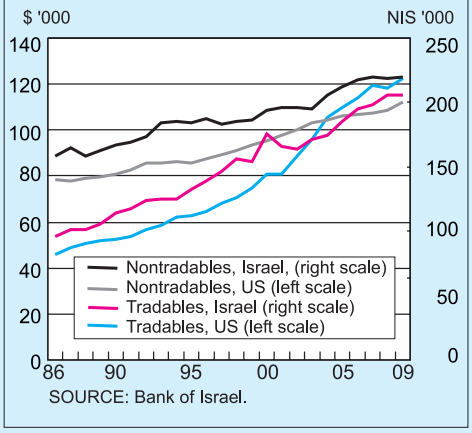
[1] An example of an empirical study which supports this claim is that of Berka and Devereux (2010), "What Determines European Real Exchange Rates?" NBER Working Paper 15753.

the price of the tradable goods is equal between the countries (in accordance with the theory of PPP), this development will lead to real appreciation, namely, to the strengthening of the currency of the first country. This box examines the Balassa-Samuelson theory, and in particular the correlation between relative productivity in the tradables sector (manufacturing and agriculture) and that in the nontradables sector (all the other industries except the public services) in the real exchange rate between Israel and the US, using data for the period 1986-2009.

An examination of the development of productivity (estimated by real product per worker[2]) over time in Israel and the US reveals similar patterns in both sectors (Figure 1): in both countries the initial level of product per worker in the tradables sector was lower than that in the nontradables one,[3] and in both of them the growth rate of the tradables sector was greater than that of the nontradables one. The accelerated growth rate of product per worker in the tradables sector was due to the rapid technological advances made in those years which affected manufacturing and agriculture more than the nontradables sectors (the Baumol-Bowen Effect). These changes in the growth rates of the sectors occurred concurrently with changes in the level of tradability of the various industries comprising these sectors, especially the business and financial services industry, which is included here in the nontradables sector even though the level of tradability of its services is increasing. The changes in this industry have not been taken into account in this box, which includes only manufacturing and agriculture in the tradables sector, as is accepted in the literature.

An examination of the productivity of the tradables sector relative to that of the nontradables sector in Israel and the US reveals that in the US the rise in this ratio was faster than it was in Israel throughout most of the period reviewed. The gap narrowed in the early 1990s, and also before the crisis which erupted in the early 2000s, a period when the growth rate of relative productivity in Israel accelerated, as the growth rate of

Figure 1
GDP per Worker in US and Israel, 1986-2009
(base year: 2005)



SOURCE: Bank of Israel.

[2] The theoretical model relates to TFP (total factor productivity), but since it is difficult to estimate this it is customary to measure productivity per worker, estimated by per capita product in each sector.

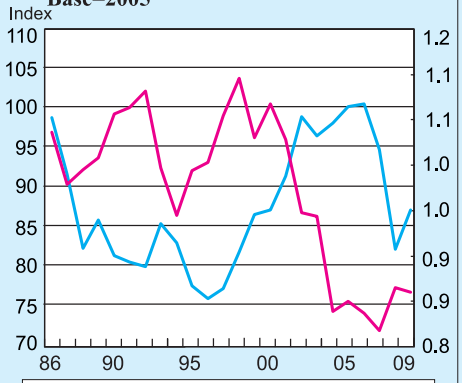
[3] The fact that the level of product per worker in the tradables sector was lower than that in the nontradables one (except in the US towards the end of the period) is surprising because the average wage in the tradables sector was higher, and this sector is relatively capital intensive. This result may be due in part to the omission of the public services industries, where product per worker is relatively low.

product per worker in manufacturing outstripped that in the business and financial services industries.

The correlation between the development of productivity in the tradables sector relative to that in the nontradables sector in Israel relative to the US, on the one hand, and the real exchange rate, based on the CPI, on the other,[4] does indeed indicate that there is a correlation between the two variables, as predicted by the Balassa-Samuelson model. According to the estimation results,[5] a 10 percent increase in the gap between Israel and the US in the productivity of the tradables sector relative to that of the nontradables is accompanied by 4.8 percent appreciation in the NIS exchange rate against the dollar,[6] given that the terms of trade and government consumption are constant.[7]

This correlation is also reflected in the long-term trends of the variables,[8]

Figure 2
Relative Productivity and the Real Exchange Rate (Index), 1986-2009
Base=2005



SOURCE: Bank of Israel.

[4] There are different definitions of the real exchange rate. In this box the index chosen for the real exchange rate is based on the CPI, because it is widely used. Using an alternative index based on prices of derived product prices, which is more in line with theoretical forecasting, does not change the results of the estimation significantly.

[5] The existence of this correlation is obtained by running a regression in which the dependent variable is the rate of change of the real exchange rate, and the explanatory variables are the rate of change of relative productivity, the terms of trade (Israel vis-à-vis the US), and government consumption as a percentage of GDP (Israel vis-à-vis the US). This correlation does not necessarily indicate a causal relation between the variables; the effect might be the reverse, for example as a result of appreciation, which reduces the share of the traditional industries (whose profit margins are low) in the entire manufacturing industry, thereby increasing the productivity of manufacturing as a whole.

[6] Similar results were obtained in the study by Dimitry Romanov (2003), "The Real Exchange Rate and the Balassa-Samuelson Hypothesis: An Appraisal of Israel's Case Since 1986" (Hebrew). Research Department, Bank of Israel, Discussion Paper series no. 2003.09, August 2003, which found a similar correlation (a 10 percent increase in relative productivity accompanied by 6 percent appreciation in the shekel vis-à-vis the dollar).

[7] According to the results of the regression, a deterioration in Israel's terms of trade vis-à-vis the US, defined as the index of export prices divided by the index of import prices (Israel vis-à-vis the US) is accompanied by real depreciation in view of the income effect. Similarly, an increase in government consumption relative to GDP (Israel vis-à-vis the US) is accompanied by appreciation because this rise has a greater effect on the demand for nontradable goods, and hence raises their relative price.

[8] Despite these trends no significant cointegrative relation was found between the variables. This finding appears to indicate that there is no long-term relation between them, even though according to the model the relations should obtain in the long run. The result may be due to the paucity of observations in the regression, which makes it difficult to examine these long-term relations.

as may be seen in Figure 2. The more rapid growth of the US tradables sector than the nontradables sector was accompanied almost throughout by local-currency depreciation in Israel. Only in the two periods when the growth rate of relative productivity in Israel accelerated—in the early 1990s and before the crisis at the beginning of the 2000s—was there a trend reversal with local-currency appreciation in Israel. Thus, in 2008, too, when the last crisis erupted, the productivity of the tradables sector relative to that of the tradables sector in Israel rose more than that in the US, and this development was accompanied by real local-currency appreciation in Israel. By contrast, during 2009 relative productivity declined, and this was accompanied by real local-currency depreciation. However, these changes in the real exchange rate in the last two years do not necessarily derive from changes in relative productivity, whose effect is expressed in the long run; they may be due to changes in relative demand, which affects the relative price of nontradables in both countries in the short run.

5. THE PRINCIPAL INDUSTRIES

I. Main developments

The trend of recovery from the economic crisis, which began in the second half of 2009, encompassed all the principal industries.

The trend of recovery from the economic crisis, which began in the second half of 2009, encompassed all the principal industries. Economic activity in 2010 was affected by the rise in global demand as well as by the stability of Israel's financial system (Table 2.6). Economic growth was fostered by the expansion of exports as well as by the increase in domestic uses, supported by expansionary macroeconomic policy, primarily in the monetary sphere. In the second half of the year the pace of growth evident in the first half was maintained in most of the principal industries.

The product of the manufacturing industry rose appreciably due to the continued recovery of demand in Israel and abroad.

The product of the manufacturing industry rose appreciably due to the continued recovery of demand in Israel and abroad. The increase in demand was met by the supply side—despite the decline in profitability resulting from the real local-currency appreciation and the deterioration in the terms of trade. The rise in labor input in manufacturing was moderate in relation to its expansion in the nontradables industries, apparently because of the reduction in the profitability of exports relative to that of the nontradables industries. Thus, the expansion of activity was based on a rise in physical capital utilization, while the increase in labor input and investment was moderate. The way factor inputs developed in this industry attests to the fact that manufacturing has not yet attained full utilization of its productive capacity.

In response to the continued exceptional rise in house prices there was a surge in construction activity, especially of residential construction, and construction product rose by 7.1 percent.

In response to the continued exceptional rise in housing prices there was a surge in construction activity, especially of residential construction, compared with the trend of the last decade. Construction product rose by 7.1 percent in 2010, exceeding the average growth rate in the business sector. Although dwelling completions have not yet risen, they are expected to do so in 2011. The expansion of construction activity

Table 2.6
The Principal Industries, 2005–10

(rates of change, at constant prices)

	Change from 2009 to 2010					2005–2009, annual averages					
	Industry weights	Product	Labor input	Capital	Monthly wage per employee post[b]	Industry weights in 2005[a]	Product	Labor input	Capital	Total factor productivity	Labor productivity	Real wage per employee post
Manufacturing	21.4	7.8	0.2	2.8	1.7	21.4	3.7	0.4	5.2	1.6	3.3	0.2
Agriculture	2.5	0.0	-5.2	1.4	0.8	2.9	1.4	-0.9	1.9	1.2	2.3	0.9
Transport and communications[c]	11.2	5.4	5.9	2.8	-3.4	11.4	4.0	2.5	3.5	0.9	1.4	-0.2
Construction	6.9	7.1	6.5	3.8	0.4	6.8	4.4	3.2	5.7	0.7	1.1	1.0
Electricity and water	3.4	-2.0	3.7	2.5	1.4	2.6	11.8	-3.5	1.3	13.5	15.9	2.1
Commerce and business services[c,d]	54.7	4.6	3.1	6.0	1.3	54.9	4.4	4.7	5.8	-0.6	-0.3	0.2
Business sector product	100.0	5.3	2.8	3.1	1.0	100.0	4.4	3.3	3.8	0.8	1.1	-0.1

[a] Excluding imputed banking services, errors and omissions.
[b] Excluding Palestinians, and since 2003, excluding foreign workers.
[c] The differences in output figures between this table and data in sector tables are due to different calculation methods.
[d] Including commerce, catering and hotel services, and financial, business and personal services.
SOURCE: Based on Central Bureau of Statistics data.

was accompanied by an impressive rise in the number of persons employed in this industry, most of them Israelis—about one quarter of the increase in the number of persons employed in the business sector as a whole—without finding real expression in wages. This situation indicates that there is no shortage of workers in the industry, as the dominant factor in the rise in the number of persons employed was the demand for workers. The construction industry is therefore an important channel by which the policy adopted since the eruption of the crisis, namely, the stimulation of economic activity, is expressed.

The product of the transport industry rose steeply after declining in 2009.

The product of the commerce and services industry expanded rapidly once again in the second half of 2009, and continued to grow at a similar rate during 2010. Labor input in the commerce and services industry rose more steeply in 2010 than in the other industries, and was accompanied by an increase in the real wage. This difference in the year-on-year development of the industry from 2009 stems from the entrenchment of economic growth in 2010 as well as from the different conditions in the labor market, which approached a full employment economic environment this year.

The product of the transport industry rose steeply after declining in 2009. The product of the land haulage industry grew by 9 percent, expressing a sharp rise in the product of the trucking industry and a moderate rise in that of buses, taxis, and trains. The expansion of the activity of the bus industry apparently derived from the expansion of demand from domestic passengers and tourists. The product of sea and air haulage rose due to the marked increase in activity—haulage of freight and passengers to and from Israel and by Israeli firms on international lines—relative to the slump of 2009.

The product of the communications industry rose by 5 percent in 2010. In the mobile telephony, high-speed internet, and multi-channel television industries penetration rates have reached saturation, so that a significant part of the rise in the industry's revenues stemmed from the introduction of new products.

II. Developments in selected industries

a. Manufacturing

The product of the manufacturing industry, constituting about one fifth of business-sector product, rose by 7.8 percent in 2010 after contracting in 2009 as a result of the global economic crisis. The continued recovery from the crisis, together with the expansion of demand in Israel and abroad, was met on the supply side despite the decline in profitability due to the deterioration in the terms of trade and the real local-currency appreciation. The response of the industry's product to the increase in demand was based on increased utilization of physical capital and the number of hours worked, while the rise in investment and in the number of employee posts was moderate—attesting to the fact that the production capacity constraint in the manufacturing industry is not yet significant.

The growth of manufacturing was not uniform throughout the year, and there were differences in its intensity between the various spheres of activity. In the first half of the year this industry grew rapidly due to the expansion of world trade and the exceptional increase in chemicals and fuel exports. In the second half of the year chemicals and fuel exports moderated and the activity of the industry declined. The activity of the other manufacturing industries was not characterized by similar volatility, and their output rose at a uniform, albeit more moderate, rate in 2010 (Table 2.7). The contribution of the high-tech industries to the growth of manufacturing as a whole was smaller than it has been in previous years, when their expansion led the growth of the industry.

The expansion of the manufacturing industry was not uniform throughout 2010 because of the exceptional rise in the exports of the chemicals and oil industries in the first half of the year.

Table 2.7
Manufacturing Production and Sales,[a] 2004-10

		2009			2010		
	2008-2004	First half	Second half	Total	First half	Second half	Total
Manufacturing production	6.4	-12.1	4.1	-6.0	17.8	-4.3	7.8
Exports (in NIS terms)	12.4	-22.8	15.5	-9.7	26.4	-10.4	15.7
Domestic sales	2.4	-5.5	0.8	-6.3	5.8	-1.0	3.6
			Excluding chemicals and oil				
Manufacturing production	4.5	-8.8	2.0	-4.8	2.5	9.9	4.2
Exports (in NIS terms)	10.9	-20.2	16.5	-7.7	11.7	3.0	13.2
Domestic sales	2.3	-6.5	-0.7	-7.2	7.6	-3.0	3.5

[a] All rates of change are annual, at constant prices. Half-yearly changes are changes from the previous half year.

SOURCE: Based on Central Bureau of Statistics Manufacturing.Surveys.

Exports

Manufacturing exports, which account for 40 percent of total manufacturing sales, rose markedly in 2010, mainly in the first half of the year. The growth rate of Israel's manufacturing exports is in line with the notable growth rate of world trade despite the real local-currency appreciation and the deterioration in the terms of trade, which has an adverse effect on the profitability of exports in 2010. Figure 2.11 shows the calculation of the return on labor in exports—an index of profitability—also taking the exchange rate and foreign trade prices[41] into account, in comparison with this figure for the entire business sector. The return on labor as a share of manufacturing export product was lower than that in the total business sector throughout most of the period reviewed, because manufacturing is more labor-intensive than the other industries. However, during most of 2010 the return on labor in exports was higher than is usually the case, and even slightly higher than the return on labor in the total business sector, meaning that the relative profitability of manufacturing exports is low. If this situation

The growth rate of Israel's manufacturing exports was consistent with the marked expansion of world trade, despite the real local-currency appreciation and the deterioration in the terms of trade, which impaired the profitability of exports in 2010.

[41] For further information on the way the index of the profitability of exports is calculated, see Bank of Israel, *Recent Economic Developments*, no. 122, p.31.

The decline in the relative profitability of manufactured exports may have been one of the reasons for the moderate increase in labor input in this industry relative to their rise in the other principal industries.

persists it could lead to the transfer of sources from manufacturing exports to other industries, so that the costs in the various industries will return to the relation that characterized most of the period reviewed, which is apparently one of equilibrium. The moderate pace at which labor inputs rose in manufacturing relative to the other industries, and especially the nontradable ones such as construction, commerce, and the hospitality and catering industries, provides evidence of this (Table 5.3 in Chapter 5, *The Labor Market*).

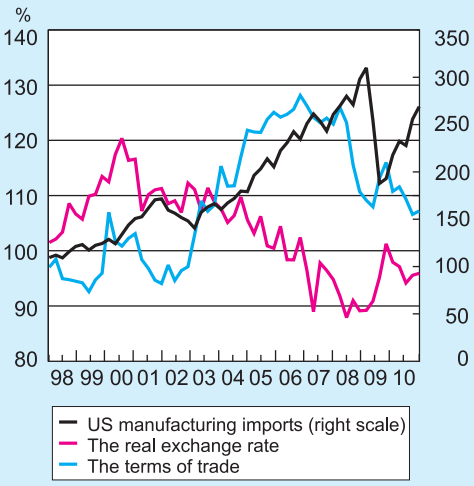
As stated, the growth rate of exports was high despite the real local-currency appreciation (Figure 2.12). The real appreciation was expressed in the lower profitability of exports, but did not inflict notable damage with regard to the quantity offered, due to generally high rates of profitability in most exporting industries. Several studies have found that shifts in the real exchange rate have only a moderate effect on the amount offered. Evidence is also provided in the box in the 2008 edition of this publication[42] indicating that the effect is concentrated primarily in industries which are not high-tech intensive, and is expressed with a lag of about a year.

The terms of trade—the ratio between prices of exports and of imported inputs—deteriorated throughout most of 2010 because of the sharp rise in the price of imported raw materials (especially fuel). However, as was the case with the real exchange rate, the terms of trade do not affect the extent of exports immediately but with a lag, apparently because of long-term trade arrangements. The adverse effect on profitability because of the deterioration in the terms of trade during the year may have been one of the reasons for the decline in exports in the second half of the year.

Figure 2.11
The Index of Export Profitability --Labor Share, 1998-2010

SOURCE: Based on Central Bureau of Statistics data.

Figure 2.12
Changes in the Factors that Affect Israel's Manufacturing Exports, September 1996-September 2010



SOURCE: Based on Central Bureau of Statistics data.

[42] See Box 2.3 in Bank of Israel, *Annual Report* for 2008, p. 67.

To some extent imports from the US reflect the development of global demand, and especially the demand for the products which Israel exports.[43] Shifts in this demand have an immediate and marked effect on Israel's exports. In 2010 trade with the US soared—after plunging in 2009—and this was the main reason for the rise in exports in 2010.

As may be seen from Table 2.8, the growth of US trade encompassed all the principal industries. The marked rally of the state of the US electronics industry—reflected in the sharp rise in the Tech Pulse Index this year—led to an increase in US trade as well as in global demand for electronic products. This increase did not lead to a proportionate rise in Israel's electronics exports, but only to a moderate rise in exports of electronic communications equipment, monitoring and surveillance equipment, and medical and scientific equipment. On the other hand, exports of the chemicals industry—such as industrial chemicals, fertilizers, and medications—as well as metals exports rose notably, leading the expansion of Israel's exports. The exports of the rubber and plastics industry, and of the textile industries—the former a mixed industry, the latter a traditional one—declined. The extent of the exports of these industries is more sensitive to real local-currency appreciation, and its negative effect

Table 2.8

Israel's Total Exports and Total US Trade, 2009-10

(dollars, rate of change, percent)

	Share of manufactured exports	2009			2010		
			Israel's total export			Israel's total export	
		US trade	($)	Real	US trade	($)	Real
Total manufactured exports	100	-26	-14	-8	22	12	11
Total excl. chemicals, fertilizers, and pharmaceuticals	78	-24	-12	-6	24	10	10
Electronics components	10	-22	166	159	28	0	-1
Electronic communications equipment	8	-11	-18	-14	17	5	5
Inspection equipment and medical and scientific equipment	10	-11	-15	-12	15	6	8
Industrial chemicals and fertilizers	9	-10	-36	-23	14	22	32
Pharmaceuticals	14	8	-6	-13	6	14	8
Metals	6	-38	-39	-34	31	48	42
Rubber and plastics	4	-15	-28	-27	23	1	-3
Textiles	2	-15	-13	-5	18	3	-1

SOURCE: Based on Central Bureau of Statistics and US foreign trade data.

[43] The use of this variable stems from the need for by-industry specificity and quarterly data, which are not available for global trade but are available in US import figures.

on profitability—which is in any case low, because of the increase in competition from developing countries—may have led to the decline in the extent of their exports.

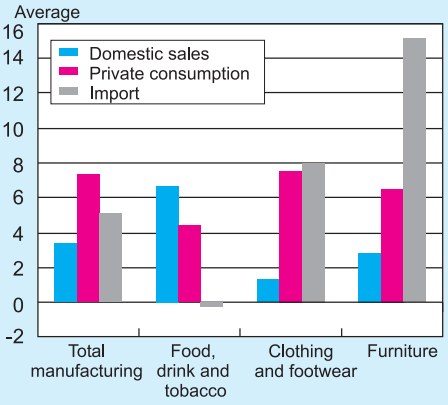
The rise in manufacturing exports throughout the first half of 2010 (Table 2.7) exceeded the increase that can be explained by the development of world trade, the terms of trade, and the real exchange rate. This reflects the exceptional growth during that period of the exports of the chemicals and oil industries, and especially those exporting industrial chemicals and fertilizers, pesticides, antiseptics and medications. Later in the year the exports of these industries declined, leading to the reduction of manufacturing exports, so that over the year as a whole the growth of exports was in line with the background conditions.

Domestic sales

Sales of manufactured goods to the domestic market account for 60 percent of the industry's total revenue. There are two main sources of domestic demand for manufacturing product—private consumption of products and investment in structures, vehicles, and equipment. As a result of the expansion of private consumption, the rise in the product of the construction industry, and the rise in the extent of investment in the principal industries in 2010 the domestic sales of the manufacturing industry were up by 2 percent, compared with their 9 percent decline in 2009.

Many manufacturing industries depend on a rise in domestic demand as the source of their growth. These include industries which depend on the extent of private consumption—such as the food and beverages industry (which sells 95 percent of its product to the domestic market), the clothing and footwear industry (about 80 percent), and the furniture industry (72 percent). As Figure 2.13 shows, these industries benefited from the expansion of domestic demand, expressed in the rise in private consumption of their products. The food and beverages industry even succeeded in expanding its share of consumption of these products at the expense of imports, while the share of domestic production in consumption of furniture, clothing, and footwear continued to be eroded by growing competition from the developing countries.

Figure 2.13
Domestic Sales and Private Consumption of Manufactured Goods, 1998 to 2010



SOURCE: Based on Central Bureau of Statistics data.

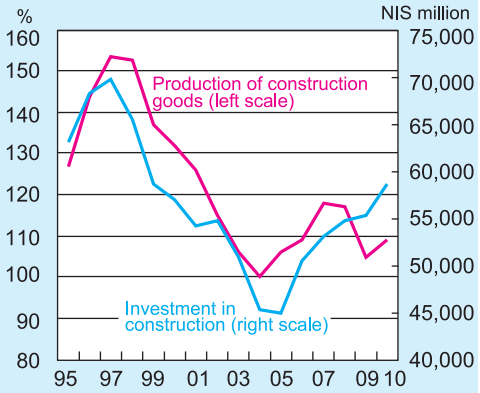
Manufacturing industries which sell their products to the construction industry expanded in 2010 due to the rapid growth of construction investment.

Additional industries which depend on domestic demand are those which sell their products to the construction industry. These include the wood industry (which sells 99 percent of its product to the domestic market), the non-metallic minerals industry[44] (90

[44] Such as glass, ceramics, and plaster.

percent), and the metal products industry (73 percent). The output of these industries constitutes about 10 percent of total manufacturing output. As Figure 2.14 shows, their production is dependent on investment in construction—both residential and nonresidential—and this was the case in 2010, too. After a slowdown in the growth rate of construction investment in 2008 and a slight decline in 2009, this investment rose rapidly once more, contributing to the increase in production by industries which sell to the construction industry.

Figure 2.14
Manufacturing Production of Goods for the Construction Industrya and Investment in Construction, 1995-2010



[a] Including stone and sand quarries (industry classification 130), metal products for construction (280), non-ferrous minerals (26) and wood excluding furniture (20).

SOURCE: Based on Central Bureau of Statistics data.

Factor inputs, productivity, and profitability

The number of employed persons and hourly labor input rose in 2010, but their rate of increase was more moderate than in the other principal industries (Table 5.3 in Chapter 5, *The Labor Market*), and did not compensate for the marked decline in 2009.[45] The fact that labor input has not yet returned to its pre-crisis level, together with the rise in labor productivity and decline in unit labor cost in total manufacturing, indicates that a supply constraint has not yet emerged with regard to labor in this industry.

The expansion of activity in the manufacturing industries in 2010 was based on the rapid rise of physical capital utilization, as was expressed in the Bank of Israel's *Companies Survey*, and to date this process has led to only a moderate increase in investment and capital stock. In view of the development of factor inputs—capital and labor—in manufacturing it is possible to assess that the industry's productive capacity has not yet been fully utilized.

The assessment is that full production capacity in manufacturing has not yet been attained.

An examination of the development of factor inputs according to their technological intensity[46] indicates that there has been a notable increase in investment in the advanced industries and a rise in unit labor cost. Consequently, these industries may be

[45] The number of persons employed in manufacturing went down by 4.8 percent in 2009, and labor input fell by 7.6 percent.

[46] Divided into three groups: a. traditional industries—food, beverages and tobacco, textile and clothing, footwear, leather and its products, wood and its products, paper and its products, printing and publishing, non-metallic minerals, basic metals, metal products, engines and electricity-distribution items; b. mixed industries—plastics and rubber, mining and quarrying, miscellaneous, jewelry and objets d'art, chemicals and oil, machinery and equipment, and transportation vehicles; c. advanced industries—electronic components, electronic communications equipment, medical equipment, and monitoring and surveillance equipment.

closer to full productive capacity than the other manufacturing industries, as the rate of unemployment among persons with a high level of education—who abound in the advanced industries—began to decline sooner than it did in the general population (see Figure 5.7, 'Unemployment Rate by Education,' in Chapter 5, *The Labor Market*).

Total measured productivity soared in 2010, reflecting primarily the cyclical element of increased utilization of machinery and equipment in the traditional and mixed industries. Total productivity in the advanced industries remained unchanged, however, providing further evidence of the possibility that these industries are closer to full productive capacity than the rest of the manufacturing industry.

Factors behind long-term developments in manufacturing and government policy

The share of the traditional industries in total manufacturing product fell sharply in 2010, but their share in total employment dipped only moderately.

Over time the share of the advanced electronics industries in total manufacturing has been rising at the expense of that of the traditional industries. This is an appropriate process in the context of Israel's comparative advantage in this industry—high-level and innovative human capital. Labor-intensive developing countries provide price competition for the traditional manufacturing industries with which it is difficult to contend. While the share of the traditional manufacturing industries in total GDP has plummeted, its share in total employment has declined only moderately: most workers in manufacturing are still employed in those industries, and their share in the industry is far greater than their contribution to GDP.

Table 2.9
Selected Indices of Manufacturing Activity, 2010

(change, percent)

		Industries		
	Total manufacturing	Low-tech	Medium-high and medium-low tech	High-tech
Production	7.8	6.9	12.9	2.6
Employees	1.7	1.7	3.9	2.7
Labor input (hours)	3.3	3.7	5.8	3.9
Nominal hourly wage cost	3.8	4.8	5.1	4.1
Unit labor cost	-1.3	0.4	-3.4	4.3
Total factor productivity	5.3	4.3	9.6	0.3
Labor productivity	5.3	4.6	13.6	-1.6
Total gross capital stock beginning of year	2.6	3.1	2.6	2.0
Investments	4.3	-2.2	13.8	2.0
Export prices relative to manufacturing output prices (real exchange rate)	-6.8	-	-	-
Export prices relative to price of imported inputs (terms of trade)	-3.8	-	-	-

SOURCE: Export data—National Accounts; other data—based on Central Bureau of Statistics industry surveys.

It is recommended that a qualitative edge be attained in the products of Israel's traditional manufacturing industries by increasing the extent of R&D and investing in human capital.

The importance of the traditional industries for employment, and their difficulty in expanding while contending with price competition underline the importance of creating a qualitative edge in products. One way of doing this is to increase the extent of Research and Development (R&D), which has been negligible to date. Two years ago the Chief Scientist in the Ministry of Industry, Trade and Labor adopted a plan to increase the extent of R&D in the traditional manufacturing industry.[47] The two main components of this plan are approving R&D budgets for plants which implement innovative production processes, and according an exemption from royalties paid to the state on profits resulting from the implementation of the project. As Figure 2.15 shows, there was an admirable increase in the extent of the grant extended to the traditional manufacturing industry in 2009 and 2010, also as a proportion of the Chief Scientist's R&D grants. Larger R&D grants in the traditional industries could lead to a process whereby the extent of their independent R&D projects increases, helping them to gain a comparative advantage in the face of competition from the developing countries, and contributing to the expansion of these industries.[48]

Another way of creating a qualitative edge is to cultivate human capital and improve the quality of workers. The average number of years of schooling in the manufacturing industry rose by 0.7 years in 1995-2010, and the extent of the increase was uniform in the various levels of the industry (Figure 2.16). It would have been reasonable to expect a more significant increase than the average in the traditional manufacturing industries, with the possible narrowing of the gap in their disfavor, but the difference in years of schooling vis-à-vis the advanced industries remained at 2.5 years throughout the period reviewed.

In 2010 the government decided to make some amendments to the Encouragement of Capital Investments Law, 5719-1959. These included, inter alia, the inclusion of a reduced grant of 10 percent in investment in human capital (compared with a grant of 30 percent for investment in physical capital). This was a step in the right

Table 2.10
Composition of GDP and Number of Employees by Technological Intensity of Industry, 1995 and 2008

	GDP		Employees	
Low-tech	50.9	33.4	63.1	54.7
Medium high-tech and medium low-tech	29.3	38.6	23.8	26.9
High-tech	19.8	28	13	18.4

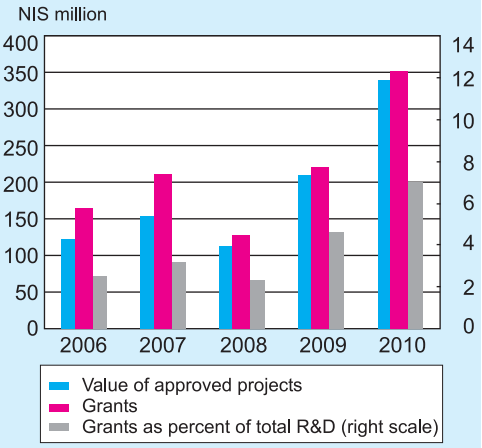
SOURCE: Based on Central Bureau of Statistics data.

[47] In the wake of the report of the Committee to Examine Ways of Empowering the Periphery and the Traditional Manufacturing Industry (the Makow Report), Ministry of Industry, Trade and Labor, October 2007.

[48] See D. Verstel, S. Lach, and S. Prizet, "The Effect of Government Support for R&D on the Economy" (Hebrew). Ministry of Industry, Trade and Labor, 2008.

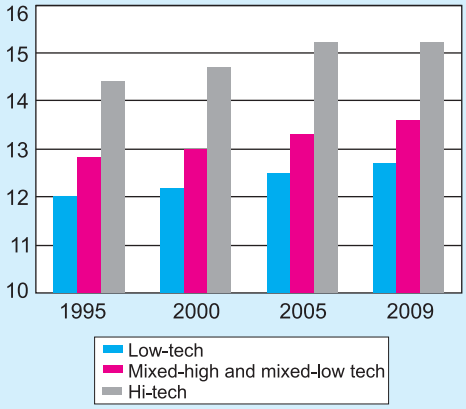
In the framework of the Encouragement of Capital Investments Law it is recommended that the grant for investment in human capital be brought into line with that for investment in physical capital.

Figure 2.15
R&D Projects in Low-Tech Industry, and Grants of the Chief Scientist, 2006-2010



SOURCE: Office of the Chief Scientist in the Ministry of Industry, Trade and Labor, and the Ministry of Finance.

Figure 2.16
Number of Years of education of Employees in manufacturing Industry, 1995-2009



SOURCE: Based on Central Bureau of Statistics data.

direction, but in view of the inferiority of some manufacturing industries in the sphere of human capital it is recommended that the grant for this kind of investment should be at least equal to that for physical capital, and that action should be taken to implement this. It is also recommended that the employment track in the Encouragement of Capital Investments Law be reinforced[49] in such a way as to provide an incentive for highly-paid qualitative employment.[50] These recommendations are further bolstered by the updating of the objectives of the law, which stress the augmentation of innovativeness and the expansion of production in general in Israel. According to the findings presented in the 2006 edition of the Bank of Israel's *Annual Report*, despite their high cost grants for investment in physical capital and tax benefits for investments did not play a very important role in increasing employment.

Another significant amendment to the Encouragement of Capital Investments Law is that the tax benefit will henceforth be extended to all manufacturing industries and will not be contingent on investment. This is a welcome change as making the benefit contingent on investment distorted the relation between the cost of capital and the cost of labor. This change also simplifies the law and reduces the uncertainty that previously characterized the system of tax benefits. However, this change also reinforces the export rule, namely, that the condition for receiving the tax

[49] The plan is for the share of the employment track in the budget of the Encouragement of Capital Investments Law to be increased from 15 to 30 percent in 2012.

[50] For a discussion of this subject, see also the box in Bank of Israel, Annual Report for 2006 (p.64), and the box in *Recent Economic Developments* 118 (p. 127).

benefit is that at least 25 percent of sales are exports. This rule will henceforth apply to all a firm's revenue, not only to the increment for investment. The question of the need for a rule of this kind has been discussed in previous editions of this publication, but it is still not clear whether it is advisable to discriminate between exporting companies and those which sell to the domestic market.

b. Construction

About a quarter of the increase in the number of employees in the business sector was in the construction industry, making it an important expression of the policy of stimulating economic activity adopted since the crisis.

House prices continued to rise for the third year in succession, and at a faster rate over the past two years, affecting all regions in Israel while reducing the variance between them. In response, there was a surge in the activity of the construction industry compared with the trend in the last decade: construction product rose by 7.1 percent in 2010, exceeding the average growth rate of business-sector product. The surge was expressed primarily in the marked increase in the number of building starts and sales of state land for residential purposes, as well as in the expansion of nonresidential construction activity after this had declined in the preceding two years. There is as yet no marked change in the number of completions, but this is expected to rise in 2011. Alongside the expansion of activity there was an impressive 7.8 percent rise in the number of persons employed in this industry, most of them Israelis, accounting for about one quarter of the increase in employment in the business sector. Thus, the construction industry constitutes an important channel of the policy of stimulating economic activity adopted since the eruption of the economic crisis.

The predominant factor in the marked rise in the number of persons employed was the demand for labor, as the surge in construction activity came in response to the increase in housing prices. However, this increase was not expressed in wage hikes, so that there does not appear to be a shortage of labor. The increase in labor input was not accompanied by the expansion of capital, so that capital/labor ratio was eroded. The steep rise in housing prices increased contractors' profitability, and this compensated for the decline in labor productivity. Despite the surge in activity, bank and nonbank credit to the industry did not rise, so that the expansion of activity appears to have been financed by sales of apartments at a stage closer to the start of construction than in the past. In response to the notable price increases, monetary and macro-prudential policy measures were implemented alongside fiscal measures intended to restrain demand and accelerate construction, in addition to the increase in the supply of state-owned land.

(i) Prices

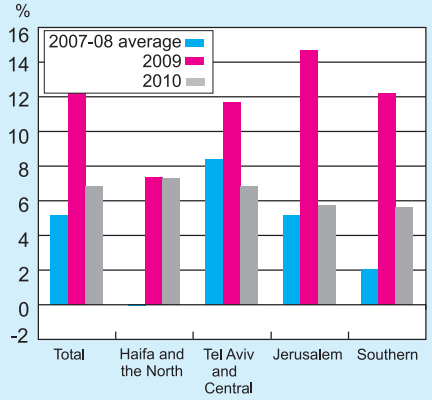
The exceptional and unprecedented rise in apartment prices continued, and there is growing divergence between the development trends of house prices and rents.

The exceptional and unprecedented rise in apartment prices persisted for the second consecutive year (Table 2.11). In the last two years there has been an average relative 30 percent increase (adjusted for the CPI without the housing component), and in the course of the last two years it has been 33 percent. Prices also rose in 2008—before the eruption of the global crisis in September—but this increase contracted after the

Bank of Israel's key interest rate was reduced to almost zero in 2009:I, in response to the crisis (see Chapters 3 and 4 below). The increase in prices was evident in all parts of Israel, with a reduction in the differences between regions in 2010 (Figure 2.17). It was accompanied by a marked rise in the extent of mortgages taken up, and especially of unindexed, variable-interest loans (which are linked to the Bank of Israel's key interest rate)—even though their share of the renewed credit flow fell to about 50 percent on average in 2010, compared with 60 percent in 2009—as well as by a notable rise in the extent of housing transactions. Sales of new apartments also accelerated, and the stock of housing available for sale contracted. Rents also rose, although at a more moderate rate in 2010, and there is a growing gap in the development of trends in housing prices and rents: in the last three years real rents rose by 12 percent compared with a 39 percent increase in apartment prices, expressing the disconnect between the two prices (Figure 2.18).

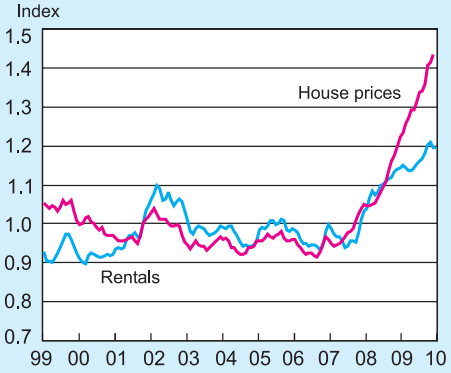
In response to these price increases, policy measures were introduced in order to restrain demand and expand the supply of apartments. In order to check demand, measures were introduced to restrict purchasing groups and raise the cost of mortgages, whose share in house prices (loan to value—LTV) is high, and especially those at unindexed local-currency interest, if the borrowers are not eligible for government aid. Restrictions were also imposed on capital inflow. These measures were introduced alongside the gradual rise in the key interest rate (see Chapter 3). On the fiscal side, in addition to increased sales of state land (see below), measures intended to increase the supply of apartments and land and contain demand through taxation were introduced in 2010:IV (see box below).

Figure 2.17
Nominal Increase in House Prices in Different Regions/Districts (Nonhedonic)



SOURCE: Based on Central Bureau of Statistics data.

Figure 2.18
House Prices and Rentals, 1999-2010 (January 2002 prices = 1)



SOURCE: Based on Central Bureau of Statistics data.

Table 2.11

Construction, Selected Data, 1997-2010

	Level in 2009 (NIS billion, 2005 prices)	Annual average change (percent)				
		2002-1997	2007-2003	2008	2009	2010
Total output	61.9	-4.9	1.8	1.6	3.1	7.4
of which Residential (including renovations)	36.1	-3.7	2.0	11.2	5.4	12.8
Nonresidential	14.0	-5.3	-0.8	0.1	-5.9	10.2
Other construction (earthworks and defense related)	9.5	1.8	2.3	-9.9	-3.6	-6.9
Inventory of houses under construction (’000)	69.6	-5.7	-0.9	3.2	3.0	9.8
Residential starts (’000 units)	39.0	-7.4	-0.7	6.0	6.2	12.3
Residential completions (’000 units)	32.8	-8.8	-3.2	3.2	7.5	0.1
Apartments offered for sale (’000)	10.2		-2.2	1.4	-12.6	0.3
Construction product	32.2	-2.7	1.9	3.1	-0.9	7.1
Total employees (’000)[a]	224.1	-4.0	0.2	3.1	-3.1	7.8
Real wage per employee post[b] (2004 prices)	6,382	1.1	0.8	1.9	-1.7	0.3
House prices relative to CPI excl. housing	--	-2.2	-3.0	2.5	12.6	15.4
Rent prices relative to CPI excl. housing	--	2.5	-3.4	-1.5	11.5	2.9
House prices relative to CPI	--	-3.6	-2.3	2.8	10.0	14.6
Rent prices relative to CPI	--	1.7	-2.7	-1.2	8.9	2.3
Input prices relative to CPI	--	-0.2	3.9	-0.6	-3.3	-0.1
Average CPI-Indexed mortgage interest rate (annual average)	--	6.2	4.8	4.1	2.4	2.2

[a] Includes an estimate of unreported foreign workers.

[b] Until 2002, derived from the wages of Israelis and foreign workers; from 2002, Israelis only

SOURCE: Based on Central Bureau of Statistics and Ministry of Housing and Construction data.

List of fiscal policy measures introduced in 2010
(The month in which the measure was implemented is in parentheses. All measures, except for the one regarding purchasing groups, are for a limited time.)

1. Measures intended to augment supply

Reduction of betterment tax on sales of land available for construction in 2011 (November 2010): provided construction work ends within 30 months. Land betterment tax was 45 percent until 2000, when it was reduced to 20 percent, so that the tax was paid according to the weighting of the tax rates in the years in which the land was in the hands of its owner. Sellers of land in 2011 will pay a tax of 20 percent for all the years it has been in their hands. There are no reliable data on the amount of land whose sale will be significantly impacted by this measure.

Measures to accelerate construction (December 2010): The Israel Land Administration Council decided, further to the government decision of November, to provide an incentive of 15 percent of the value of the land to contractors who complete construction (i.e., obtain the form authorizing occupancy) within 30 months of the day on which they win the tender for the land. This proposal will apply to residential construction projects with an intensity of at least 50 housing units).

Exemption from betterment tax on the sale of apartments for investment purposes (December 2010): As of January 2011 persons owning an apartment in addition to the one in which they reside will be exempt from the betterment tax (at 20 percent) on the apartment, provided they sell it in 2011 or 2012. The exemption will apply to the sale of up to 2 apartments (up to a top price of NIS 2.2 million per apartment), in addition to one apartment which may be sold at the exemption currently prevailing under law.[1] At the end of the period of the exemption the situation will revert to that currently prevailing under the law. This measure is also intended to provide investors with an incentive to sell apartments.

2. Measures intended to restrain demand

Increase in purchase tax for buyers of apartments for investment purposes (December 2010): This law will go into effect on 21 February, due to the legislative process. In 2011 and 2012 purchase tax for buyers of apartments for

[1] Under the current law, persons selling a second or additional apartment within 4 years must pay betterment tax, while the seller of one apartment is exempt.

investment purposes is as shown in the table.[2] This measure is expected to act indirectly to cut prices for first-time buyers by reducing purchases by investors.

Cancellation of exemption from V.A.T. for purchasing groups (submitted in the framework of the National Budget for 2011-2012): purchasing groups were regarded as buyers of land and not of apartments, and were therefore exempt from paying V.A.T.

House price (million shekels)	Tax rate (%)	
	Before change	After change
Up to 1	3.5	5
1-3	5	6
3 and over	5	7

[2] It is not clear how this measure will affect first-time apartment buyers, who generally buy relatively cheap apartments. On the one hand, the reduction of purchases by investors is expected to work indirectly to reduce apartment prices, but on the other the relative tax on purchases of apartments worth up to NIS 1 million has been reduced as a result of the measures, and these apartments also tend to be bought for investment purposes, which could serve to make them more expensive.

Sale of land and assessment of its effect on prices

The measures listed above were implemented only towards the end of 2010. Previously, starting in 2009:IV, campaigns had been held to sell state-owned land through several auctions. The question is, to what extent did an increase in land sales affect prices? It is reasonable to assume that the effect on prices of the measures intended to restrain demand is faster than that of the increased supply of state-owned land. This is because it takes about three years from the sale of land until construction begins, as is indicated by an econometric analysis of data from the last decade (Table 2.12),[51] and construction takes about 2 years from start to completion. However, the time required

It takes about three years from the sale of land to the onset of construction, so that the increase in the sale of state land through auctions since 2009: IV has not yet been expressed in building permits; hence to date this increase has, perhaps, affected prices solely via expectations regarding them.

[51] The amount of time between the sale of land and the approval of the transaction by the Land Administration Council has been estimated at about 6 months: about 2 months from the time the auction is published until the envelopes containing the bids are opened; about one more month from then until the bids are accepted or rejected; and another 2 months until the persons submitting the successful bids make the payment. When a regression was run of building starts on Land Administration Council approvals, the lags of 8 and 12 quarters (2 and 3 years) was found to be significant, with an explanatory power of 67 percent; when a regression was run of building starts by the private sector on construction permits of this sector significant lags of 1-6 months were found.

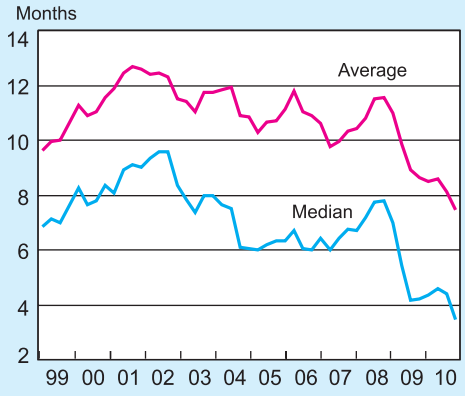
from the start of construction to the point at which a sale takes place (the point at which the actual price is set) has been reduced in the last 2 years, as Figure 2.19 shows, and some apartments may even be sold in the time between receipt of the permit and the inception of construction ('on paper'). Hence, it may be assessed that the effect of the increase in land sales on the actual price is expressed, at the earliest, in the amount of time between receipt of the permit and the commencement of construction, i.e., two and a half years after the date at which the announcement regarding the sale of the land is made. Thus, the increased sale of land by auction since 2009: IV has not yet been expressed in construction permits, so that if it has had any effect on prices to date this is solely in the realm of expectations. This constitutes another expression of the considerable rigidity of supply in the short term.

Data to the end of 2010 indicate that the 'gross' supply of land has not risen appreciably: in the last two years only another 17,500 housing units have been added a year on average, compared with 16,000 in the period from 2000 to 2008 (moreover, not all the land put up for sale was in fact sold). This is not in line with the quantity indicated by Land Administration Council permits, which constitute final authorization to sell land by auction, after a buyer has been found for it and the buyer has paid for the land and its development. This has risen in the last two years to an annual average of 20,800 housing units, compared with 15,800 in the period from 2000 to 2008 (see below).

Table 2.12
Time Taken from Sale of Land to Completion of Building

Time (in years) between stages	Stage
	Sale of land
0.5	↓
	Israel Lands Authority confirmation
1.5-2.5	↓
	Building permits
0.5	↓
	Start of building
2	↓
	Completion of building

Figure 2.19
Average Time from the Start of House Construction to their Sale, 1998-2010



SOURCE: Based on Central Bureau of Statistics data

Analysis of the reasons for the rise in housing prices

Many indicators in the development of apartment prices reflect asset portfolio considerations (apartments for investment purposes) rather than housing requirements.

Against the backdrop of the continued notable increase in prices, two questions were raised, the answers to which are important in order to adopt the right policy. First, to what extent does this development reflect a shortage in the supply of apartments and the 'real' need for housing services? This is because the extent of apartments constructed in the course of the decade, an annual average of 32,000, was lower than the annual increment of households—about 40,000. Second, to what extent does the accelerated rise in prices indicate the development of a bubble? On the one hand, it comes after a protracted real decline in prices since 1997, so that the increase (especially since the trough of 2007) reflects an adjustment—albeit rather rapid—to the long-term development trend. On the other, many indications in this development reflect asset portfolio considerations (apartments for investment purposes), namely, the search for an alternative yield source, rather than the need for housing services, and hence push apartment prices up, alongside the following features: a. Apartment prices have moved away from rents; b. The price increase accelerated after the Bank of Israel's key interest rate was reduced to almost zero in 2009:I, concurrent with the rise in share prices; c. The rise in prices was not selective, and was evident throughout Israel, including areas where demand is low and there is not a high concentration of population. Note that the accelerated rise in apartment prices is not unique to Israel, and is in evidence in other countries which, like Israel, were less adversely affected by the economic crisis. Those countries also followed the US and Europe in reducing interest rates, and were characterized by a rise of house prices, capital inflow and pressure for the appreciation of their currencies.[52] This phenomenon also undermines the possibility that a shortage of apartments is the predominant factor in this development.

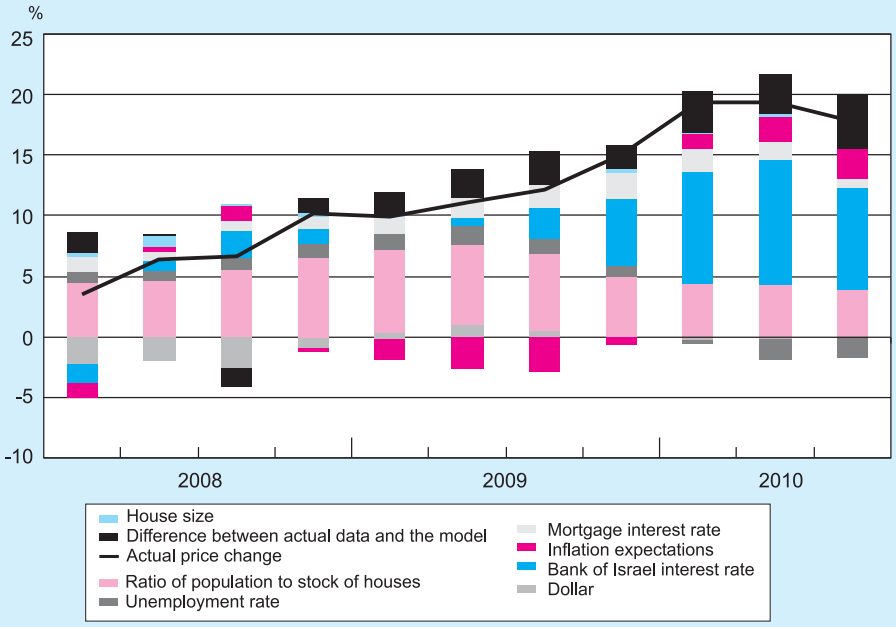
A study found that the Bank of Israel's key interest rate, which was reduced because of the crisis, explains about half the rise in prices in the last two years, while the shortage of apartments explains only about one fifth of it.

Two studies undertaken in the Bank of Israel examined these questions. One study found that the level of prices at the end of 2010 does not indicate a bubble at present, despite the rise in prices in the last two years, and also that if there is a deviation from the long-term trend, it is small (see Chapter 3 below). Another study,[53] which examined the reasons for the price rise in the last decade (Figure 2.20) found that the Bank of Israel's key interest rate, which was reduced because of the economic crisis, explains about half of the increase in prices in the last two years, while the shortage of apartments, expressed in the variable 'ratio of population to housing stock,' explains only about one fifth of the rise. Another finding was that there is an unexplained residual of 20 percent (about 4 points a year) which in the recent past is always positive, and can therefore be interpreted as indicating an excessive price rise. The study also

[52] These countries include Norway, Sweden, Switzerland, Singapore, Hong Kong, Australia, and China. They also took steps in 2010 to deal with the accelerated increase in housing prices: raising the interest rate, reducing LTV of housing loans, issuing instructions to banks and borrowers, restricting apartment purchases by non-residents, taxation, and measures intended to augment construction. For further details, see Bank of Israel, *Inflation Report* 32, for 2010:III.

[53] See W. Nagar and G. Segal (2010), "The Housing Market in Israel: Structural Factors in Apartment Prices and Rents, 1999-2010" (Hebrew) draft.

Figure 2.20
Contribution of Different Variables[a] to the Changes in House Prices, 2008-2010:Q3



[a] The sections of the columns are in percentage points.

found that under the present circumstances the effect of the interest rate will grow weaker in the year ahead, whereas the shortage of apartments will continue to have an effect of around 3 percent per year. Note, too, that the impressive increase in building starts in 2010 (see below) has not yet found expression in these equations; though it is expected to begin to effect them from next year on, so that the effect of the shortage of apartments will be even smaller. The main result that emerges from the study is that the shortage of apartments is not the main reason for the recent increase in prices, so that it is necessary to focus on restraining demand. A disproportionate increase in the supply of land is not the right solution for the present increase in prices, as excessive expansion could lead in future to a sharp reversal of the price trend, especially when the interest rate is raised to its normal level.[54]

(ii) Activity

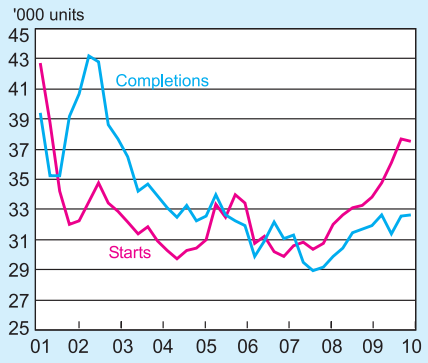
The activity of this industry rose impressively, as expressed in both residential and nonresidential construction, which together account for 75 percent of the industry and whose growth rate was higher than that of the industry's product. Notwithstanding,

[54] Another important finding in the study is that the central bank's key interest rate affects rents (the index of housing prices which is included in the CPI) via its effect on apartment prices, but not directly. Since rents are a component of inflation, apartment prices are one of the passthrough mechanisms from monetary policy to inflation. This connection, which is unavoidable, embodies risks for excessive increases in apartment prices.

other construction activity—infrastructure, earthworks, and security work—which are mainly initiated by the public sector, declined for the third year in succession (Table 2.11).

In the last three years apartment construction starts have risen, after declining since 1997. The growth rate accelerated in 2010, reaching 39,000 housing units at the end of the year—as at the beginning of the decade—compared with an annual average level of 32,000 housing units during the decade (Figure 2.21). The number of building permits issued, which makes it possible to predict the number of building starts for a period of up to six months, indicates that this pace will continue (Figure 2.22). Nevertheless, there was no change in building completions in 2010. Thus, as of now, there has been no addition to housing services, but those are already expected to increase in 2011. The construction of nonresidential structures rose notably in 2010, after declining in the two preceding years, and consisted of structures for commerce and services, business and offices, as well as construction for local authorities.

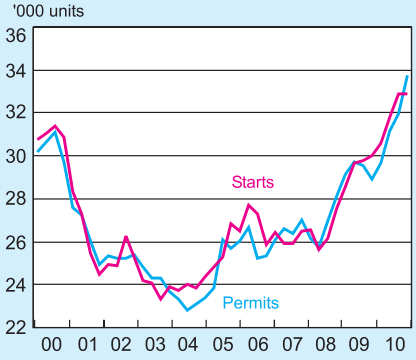
Figure 2.21
Annual Building Starts and Completions, 2001-10



SOURCE: Based on Central Bureau of Statistics data.

The number of building starts rose to 39,000 at the end of 2010—the same as at the beginning of the decade—compared with an average level of 32,000 units during the decade.

Figure 2.22
Annual Private Sector Building Permits and Building Starts, 2000-10



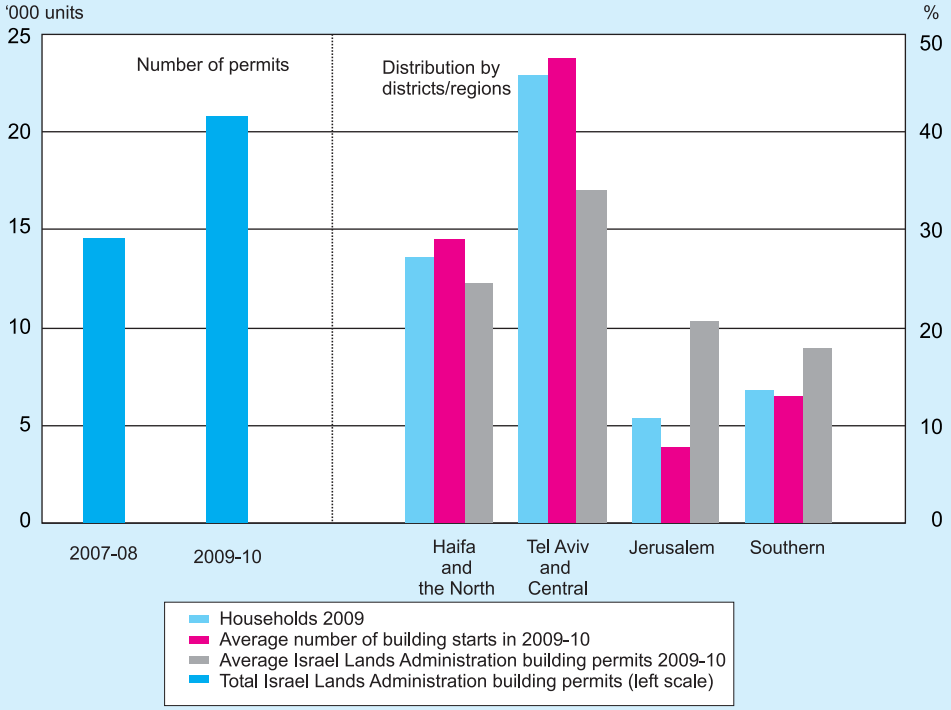
SOURCE: Based on Central Bureau of Statistics data.

Most of the increase in starts represented the response of the private sector to the price rise and was not government initiated. This situation is in line with the efficient functioning of the market.

Building starts were spread throughout Israel, in line with the distribution of households (Figure 2.23) and similar to their dispersal before the surge. Because the campaigns to sell land since the end of 2009 were not yet expressed in building starts in 2010 (as explained above), most of their rise stems from the response of the private sector to the rise in prices rather than to the government initiative[55] (even though it may have provided a trigger by issuing permits). This situation is consistent with the efficient functioning of the market. However, even though there has been an appreciable increase in the supply of land in the last two years, according to the permits issued by the Land Administration Council, its distribution throughout Israel was not in line with that of households—it was positively biased towards the Jerusalem region (with a significant portion in Beit Shemesh) and the south, and was negatively biased toward the north and center. Consequently, the direct effect of land sales on damping the increase in prices might

[55] Government-initiated building starts rose by about 500 housing units in 2010, to about 4,700 units.

Figure 2.23
Distribution of Households, Building Starts and ILA[a] Building Permits by Regions/Districts



[a] Israel Lands Administration.
SOURCE: Based on Central Bureau of Statistics data.

be expressed in the areas of Jerusalem and south, but not in the center and the north. However, while it may also have an indirect effect through the dispersal of the population, a process of this kind is inevitably slower.

Despite the increase in the number of persons employed in Israel resulting from the expansion of demand, the real wage did not rise. This combination attests to considerable elasticity in the supply of workers, making it possible to conclude that there is no shortage of workers in the construction industry.

(iii) Factor inputs and profitability

Employed persons

Concurrent with the surge in construction activity in 2010, the number of persons employed in this industry rose significantly—on average by about 16,000 persons (7.8 percent), 14,000 of them Israelis and 2,500 Palestinians (Table 2.13). End-year data, i.e., data for 2010:IV compared with data for 2009:IV, show that the increase was in fact of 21,000 employed persons, about half of them in 'wet work' (which includes wall and floor tilers, plasterers, masons, iron workers, and molders.) The demand side seems to have been the dominant factor in the rise in the number of persons employed, as activity also expanded, in response to the hike in apartment prices. Nonetheless, the

real wage did not rise (or did so by only 0.3 percent, Table 2.14). This combination attests to considerable elasticity in the supply of labor, and makes it possible to infer that there is no shortage of construction workers.[56]

There may be several reasons for the slow rate at which wages have risen: a. New employees have low levels of education, start at the lowest grade of the wage scale in the construction industry (see below), and thus bring the average wage down. b. Some of the new employees do not seem to be of an adequate professional level, and their wage is also at the lowest grade of the wage scale in the industry. The need to train them on the job also explains the fact that they are taken on at a low wage, because of the expense of their training and low productivity at that stage. c. Palestinian workers are also recruited, and their wage is relatively low, also serving to reduce the average, even though their wages have risen more than the average in the industry.

The backdrop to the impressive increase in the number of Israelis employed in the construction industry was not only the marked rise in its activity but also the adoption

Table 2.13
Composition of Employees in the Construction Industry, 2000-10

'000

Employees	('000)		Change from previous year					
	2000	2010	2006	2007	2008	2009	2010	2000-2010
Total	238.1	224.1	5.1	18.4	6.4	-6.5	16.2	-13.9
Israelis	117.8	157.4	7.4	15.9	0.5	-8.3	13.8	39.6
Foreigners	62.5	36.8	-0.2	-1.9	3.5	0.5	-0.1	-25.7
Palestinians	57.8	29.9	-3.0	4.5	2.5	1.3	2.6	-27.8
Composition of Israelis:								
Builders and construction workers	38.4	56.5	4.3	7.4	3.1	-7.6	6.1	18.1
of which "wet work"[a]	25.5	40.7	4.2	5.4	1.7	-7.5	5.3	15.3
Non-Jewish Israelis:								
Total	43.3	73.6	7.3	7.6	-0.5	-1.8	6.7	30.3
Builders and construction workers	21.4	38.9	3.6	6.2	1.2	-4.2	5.9	17.5
of which "wet work"[a]	17.2	32.4	3.2	4.2	0.4	-4.4	6.7	15.1

[a] "Wet work" includes wall and floor tilers, plasterers, masons, iron workers, and molders.
Source:Based on Central Bureau of Statistics data.

[56]However, a survey of vacancies indicates that on average there were 7,400 positions in the industry in the period from September to November 2010, compared with 5,300 in the equivalent period in 2009—a rate of vacancies of about 3 percent. About 45 percent of these posts were in 'wet work,' above the accepted rate in the industry, which is estimated at about 30 percent. This situation indicates that there is upward pressure on wages in the industry, as well as the potential to recruit additional workers.

Table 2.14
Indicators of Productivity in the Construction Industry, 2006-10

	2006	2007	2008	2009	2010	2006-2010
	(Percentage change)					
Product						
Total	11.3	4.5	3.1	-0.9	7.1	27.3
Per worker	8.3	-4.7	0.0	2.2	-0.7	4.8
per hour	7.6	-4.8	0.6	1.5	0.5	5.2
Capital						
Per worker	0.3	-4.2	3.8	10.7	-3.7	6.2
per hour	-0.3	-4.4	4.5	9.9	-2.6	6.6
Real wage per employee post in construction						
Total	0.7	1.8	1.1	-2.0	0.6	2.2
Israelis and non-Israelis	1.1	2.8	1.9	-1.7	0.4	4.4
Israelis	0.8	2.3	2.5	-1.9	0.3	4.1
Real wage per employee post in business sector						
Total	1.3	1.6	-0.7	-2.6	0.9	0.5
Israelis	1.3	1.8	-0.3	-2.5	0.9	1.1

Source:Based on Central Bureau of Statistics and Bank of Israel data.

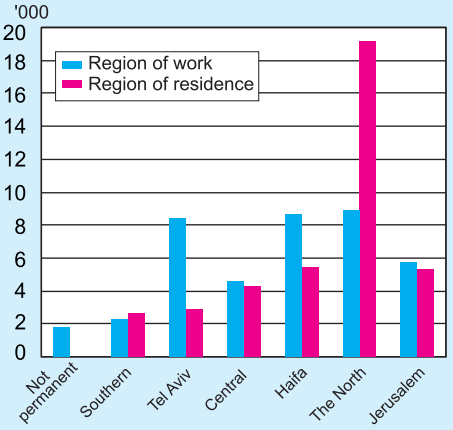
by the government of a socio-economic agenda in April 2007,[57] according to which the number of foreign workers in construction should be reduced to zero by 2012, in order to diminish poverty and income inequality. The greater number of Israelis employed in the industry disproves the generally accepted contention that Israelis are not willing to work in construction, especially in 'wet work'. The year-on-year changes, (e.g., from 2008 to 2009) also attest to the potential for recruiting more workers.

The increase in the number of Israelis employed in construction also has a positive effect on the welfare situation. This increase constitutes about one quarter of the rise in employment in the business sector, and about half of the increase in the number of men employed in the business sector. Based on the characteristics of this segment of the population, these men are usually the family's main breadwinner. Furthermore, many of the additional employees are non-Jewish Israelis—a segment of the population which has a higher than average poverty rate. Many of the persons employed in this industry work away from their areas of residence, and this applies particularly to residents of the north of the country (Figure 2.24), who are characterized by above-

[57] "The Report of the Committee to Determine Policy Regarding Non-Israeli Workers: a Socio-Economic Agenda for Israel, 2008-2010." The number of foreign workers in the construction industry in the table is apparently biased upwards. The quota of legal foreign workers in the industry should have declined from 8,000 to 5,000 in July 2010, but the implementation of this decision was postponed for a year. In 2010 the quota of permits issued for Palestinian workers was increased by 2,000. In January 2011 the socio-economic cabinet decided to increase the quota of permits for Palestinian workers by 5.250, 4,000 of them in construction. These measures are not consistent with the view and the path of the socio-economic agenda and the low wages in the construction industry.

average unemployment rates and below-average income rates, a situation that also attests to recruiting potential. From the aggregate of these characteristics it is clear that by employing Israelis the industry plays a significant role in the rise in the total employment rate and the decline in unemployment, together with the reduction of income inequality and the reduction of poverty in Israel.

Figure 2.24
Employees in Construction by Region of Residence and Region of Work, 2010



SOURCE: Based on Central Bureau of Statistics data.

In the context of these positive developments in the employment of Israelis in construction—contributing to the reduction of unemployment, inequality, and poverty—it is important for the activity of the industry to go on relying on employing Israelis, even if this involves a wage hike. Hence, it is important to continue working to put an end to the traditional employment of non-Israelis. Various studies have shown that there is substitution between Israelis and non-Israelis, especially in the construction industry.[58] An analysis undertaken in the Research Department[59] shows that the entry of non-Israeli workers has also served to retard technological advances in the industry, expressed in the stagnation of labor productivity and the real wage per employee since the 1960s, as well as in the significant erosion of these variables in relation to the business sector as a whole. An international comparison—to the middle of the last decade—of the relative wage in construction compared with the total business sector indicates that Israel, where the ratio is 83 percent (compared with over 100 percent in the 1960s), is in the lowest position among the developed countries (except for Singapore), and is even below several developing countries. The analysis also shows that a 20 percent real wage hike in construction would lead to an average increase in apartment prices of 3.5 percent at the most.

Against the backdrop of these positive developments in the employment of Israelis in construction, which serves to reduce unemployment, inequality, and poverty, the expansion of activity in this industry must continue to rely on the employment of Israelis. It is therefore desirable to continue acting in order to end the employment of non-Israelis.

[58] N. Sussman and D. Romanov (2003), "Foreign Workers in the Construction Industry: the Situation and Political Implications," Bank of Israel, Research Department, Discussion Paper (June) (Hebrew); D. Gottlieb (2002), "The Influence of Non-Israeli Workers on Employment, Wages, and Inequality, 1995-2000," Bank of Israel and Sapir Forum (July) (Hebrew); S. Amir and D. Gottlieb (2005), "The Entry of Foreigners and the Elimination of Local Workers from Employment in Israel" Economic Research Planning Authority, Ministry of Industry, Trade and Labor (September) (Hebrew); Z. Eckstein and S. Prizat (2003), "The Substitution of Foreign Workers by Israeli Workers in the Construction Industry" (Hebrew), Applied Economics Ltd., for the Association of Contractors in Israel.

[59] See W. Nagar (2011), "An Analysis of the Construction Industry in Israel: the Composition of Employees and the Development of Mechanization, 1960-2010" (Hebrew) (draft).

Despite the positive developments, the low level of wages could hamper the continued recruitment of Israeli workers in the industry—whether in order to expand activity or to replace the non-Israeli workers. In January 2010 the Contractors Association reached a new wage agreement with the Federation of Workers (Histadrut) with regard to construction employees. The main point of the agreement was an increase in the wage scale for construction workers so that their minimum wage would be NIS 500 higher than the minimum wage in the overall economy, and stand at NIS 4,350. Subsequently, wages would rise so that at the highest grade, grade 8, they would reach NIS 6,200. The increment in wages is a step in the right direction, but it is doubtful whether it will be sufficient to attract and provide an incentive for the recruitment of additional Israeli workers, because even at the highest grade, wages are significantly lower than the average wage in construction today—NIS 6,940 (NIS 7,615 for Israelis only),[60] which is also below the average wage in Israel—NIS 8,400. Moreover, an agreement to raise the minimum wage from NIS 3,850 to NIS 4,300,[61] is currently being negotiated, and this will not automatically result in the adjustment of the agreement regarding the construction industry, so that the small increment that the agreement is supposed to give to construction workers has already been eroded in relative terms.

Capital, productivity, and the funding of activity

The increase in capital did not keep up with the pace at which labor inputs rose, so that there was a decline in the capital/labor ratio. The combination of the recruitment of workers and the decline in the capital/labor ratio should have led to a decline in labor productivity, but no such real decline has occurred (Table 2.14). It can therefore be concluded that the rise in prices contributed to contractors' increased profitability, and this compensated for the decline in productivity.

Despite the lively activity in the industry in 2010, and the appreciable rise in the number of building starts, the current financing of contractors did not rise. Similarly, according to the *Companies Survey* no financing problems were reported during the year. Net capital-market issues by construction companies, including share issues, amounted to only NIS 1 billion. With regard to bank financing—balance-sheet credit to the construction industry (in contrast with that to the real-estate industry) declined, but credit also includes off-balance-sheet credit, which rose by NIS 8.7 billion (Table 2.15). The data show that a large part of the rise in off-balance-sheet credit reflects the sales guarantees extended to apartment buyers. It seems, therefore, that the surge in the market and advance apartment sales—to a time closer to the start of construction of apartments—financed contractors' activities.

[60] The average wage in the industry also includes the wages of office workers, managers, engineers, etc., and is therefore higher.

[61] The agreement is between the Manufacturers Association and the Federation of Labor.

Table 2.15
The Change in the Financing of the Construction Industry in 2010

1. From the capital market (NIS billion)

	Issues		Repayments	Net
	Bonds	Shares	Bonds	
	7	5.9	12	0.9

2. From the Israeli banking system

	On balance sheet		Including off balance sheet	
	NIS billion	%	NIS billion	%
Construction and real estate	-1.7	-2.2	4.2	3.3
Real estate	-0.3	-0.8	-4.4	-8.3
Construction	-1.3	-3.8	8.7	11.5

Source: Bank of Israel data.

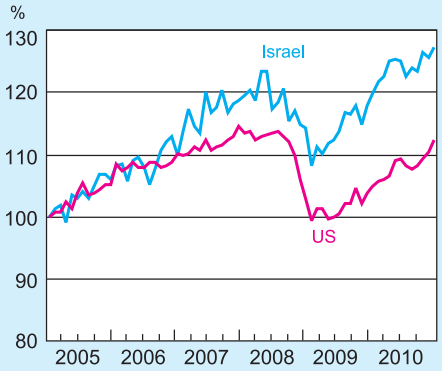
c. Commerce and services

The product of the commerce and services industry rose in 2010, particularly due to the increase in domestic economic activity, while services exports rose only moderately.

The product of the commerce and services industry, accounting for 57 percent of business-sector product, grew by 8 percent in 2010 after a slowdown in its growth rate at the beginning of 2009. The product of this industry began to expand rapidly in the second half of 2009, and persisted at a similar rate during 2010. Labor input in commerce and services increased in 2010 at a rate equivalent to that evident in 2009, but—in contrast to that year, when wages in the industry declined—this was accompanied by a real wage hike. This difference in development between 2009 and 2010 derives from the entrenchment of growth in 2010, as well as from the changed conditions in the labor market, which approached full employment this year.

The expansion of the commerce and services industry was led by domestic activity, whereas services exports rose only moderately in most areas of activity. Total services exports rose particularly as a result of the increased export of tourism services, which contributed to the export of transport services.

Figure 2.25
Change in Trade Industry Revenue in Israel and the US, 2005-10



SOURCE: Based on Central Bureau of Statistics data.

(i) Commerce

The product of the commerce industry, which constitutes about 17 percent of business-sector product, returned to its upward trend in 2010 after contracting

Table 2.16
Main Trade and Services Indices, 2004–10

(rates of change, percent)

	Share in trade and services product (%)	Labor input	Real wage per employee	
2004-08				
Trade and services	100	6.8	4.0	1.2
Trade	23	4.9	3.6	0.5
Services	77	7.4	4.1	1.4
Of which: Hotels and restaurants	4	5.8	15.9	0.2
Banking, insurance and financial services	69	8.2	22.5	12.2
Personal and other[a]	6	7.0	21.4	-1.4
2009				
Trade and services	100	4.3	-26.3	-4.3
Trade	22	-1.3	-3.0	-2.5
Services	78	6.2	-33.9	-4.8
Of which: Hotels and restaurants	4	-3.9	1.6	-1.1
Banking, insurance and financial services	69	-7.0	4.0	-7.7
Personal and other[a]	6	0.3	5.6	-2.0
2010				
Trade and services	100	8.0	3.3	1.3
Trade	22	7.8	3.1	1.5
Services	78	8.2	3.4	1.2
Of which: Hotels and restaurants	4	8.1	2.9	1.3
Banking, insurance and financial services	69	8.2	3.5	1.5
Personal and other[a]	6	8.2	3.5	0.5

[a] In order to present detailed sector data, rates of change are based on sales figures in constant prices, unlike table 2.6.
SOURCE: Central Bureau of Statistics.

slightly in 2009. As a result of the renewal of the industry's growth trend, its labor input rose, as did its real wage.

A comparison of the development of the sales revenue index (at constant prices) of commerce in Israel and the US (Figure 2.25) helps to provide an understanding of the reasons for the development of the industry in the last three years. The comparison shows two main points: first, the timing of the turnaround—the cessation of growth at the beginning of 2008 and its renewal at the beginning of 2009—is common to the sales revenue indices of both Israel and the US; second, the decline in revenue in the US during 2008 was deeper than it was in Israel, and the growth rate after the

recovery was more moderate. The common timing of the turning-point hints at the reasons for the adverse effect on commerce during the crisis—a decline in the value of households' financial wealth and the detrimental effect on consumer trust of fears that the crisis would worsen. While the source of these factors—the global financial crisis that had begun in the US— was shared, its intensity in the US was greater, so that the pace of recovery from these difficulties was—and still is—slower in the US.

The new regulations regarding cash refunds to customers may lead to competition between businesses with regard to their generosity in pursuing this policy, and hence to the attainment of the benefits embodied in it.

In December 2010 regulations requiring businesses to refund money to customers who decide to return goods or cancel orders for goods, under certain conditions and subject to terms that make distinctions between kinds of goods, went into effect.[62] This measure is of great importance in the sphere of customer protection, but may also have economic benefits. In most countries this policy has developed independently in the wake of market competition, and studies undertaken elsewhere[63] have shown that the benefits have motivated businesses to introduce this practice voluntarily: a measure of this kind signals the quality of products, attracts potential customers who are risk-averse, and in the final event increases net demand (after the return) in the market. The fact that in Israel this policy was imposed detracts from its advantages, but may lead to competition between firms with regard to the extent of generosity displayed in adopting the policy, thus making it possible to reap the benefits embodied in it.

(ii) Selected services

Business services: the product of the business services industry, which accounts for about one quarter of business-sector product, resumed its growth trend in 2010 after stagnating in 2009. The main reason for the expansion of the industry was the acceleration of the growth rate of domestic uses together with domestic demand for services. Although the renewed upward trend in exports of business services—one third of the industry's product—is still moderate, it also contributed to the expansion of product, after its decline was the main cause of the contraction of activity in the services industry during the crisis. The number of persons employed in business services rose in 2010, and the number of unfilled positions in it was the highest in the principal industries, attesting to the industry's growth potential in the near future.[64]

Computer and R&D services account for about one third of business services. In common with the other commerce and services industries, activity in this industry resumed its growth trend in 2010 after declining during the crisis. However, the growth rate of its product in 2010 (4.4 percent) is still below the rapid growth rate of 2004-2007 (12 percent on average).

[62] Full information on these regulations may be found on the website of the Ministry of Industry, Trade and Labor, where there is also a background document by the Ministry's Research and Economics Authority: Roni Bar-Tzuri, "Cancelling a Purchase and Giving a Cash Refund."

[63] "The Option Value of Returns: Theory and Empirical Evidence" (2009), E.Anderson, K.Hanssen, and D.Semester, Marketing Science, vol. 28.

[64] For further details, see Chapter 5, *The Labor Market*.

Both the export of software and R&D services and the extent of capital raised on the risk-capital market are still far from their pre-crisis level.

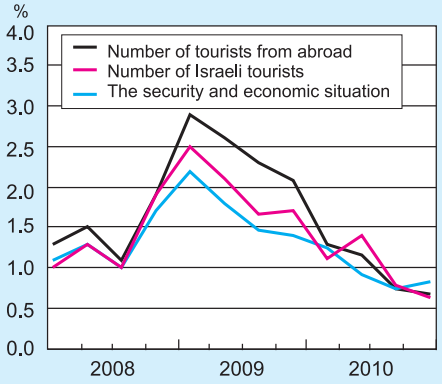
Exports of computer and R&D services, which include the export of the services of start-up companies inter alia, declined in 2010. This expresses the reduction of the extent of capital raised by these firms in the last two years as a result of the global financial crisis, recovery from which has not yet concluded. Thus, while capital raised on the risk capital market—the engine of growth for start-up firms in this industry—began to recover in the course of 2010, its extent is still far from what it was before the crisis.

Banking, insurance, and other financial institutions:[65] the product of the financial institutions, which represent 10 percent of business-sector product, rose by 4.5 percent in 2010, and the number of persons employed in this industry rose by a similar extent. The real wage in the financial services industry rose by 4.5 percent in 2010—the greatest increase of all the principal industries. However, the rise in the real wage in 2010 was only a partial adjustment of its sharp decline in 2009 as a result of the financial crisis and its impact on the profits of these entities.[66]

The rapid rise in foreign tourist entries brought the hotels close to full occupancy in peak periods and certain parts of the country.

Tourism and hospitality services: the product of the tourism and hospitality services industry, which constitutes 2.5 percent of business-sector product, was up by 5 percent in 2010 over 2009, after its activity stalled in 2009. Most of the increase in 2010 was due to the rapid rise in tourist entries from abroad and the resulting increase in revenue. The recovery of incoming tourism began in the second half of 2009, after plummeting—because of the crisis—at the beginning of that year. The return to the rapid growth rate in the number of bed-nights brought hotels to a situation of full occupancy, primarily at peak periods and certain areas, such as Jerusalem and Tel Aviv (for more information, see Box 2.3, below).

Figure 2.26
Demand-Side Constraints[a] in the Tourist Industry, 2008-10



[a] The severity of the constraint is between 0 and 4. Zero means no constraint, and 4 means the highest degree of severity of the constraint.

SOURCE: Based on Central Bureau of Statistics data.

The rapid and sharp shifts in the situation of the tourism industry in the last three years are also indicated by the demand constraints revealed by the Bank of Israel's *Companies Survey* (Figure 2.26). In the second half of 2008 the demand constraint worsened, especially with regard to the number of tourists, and peaked at the beginning of 2009. Later that year this and other constraints began to ease, even reaching a point below that at the beginning of 2008, before the crisis.

[65] The account here is intended to complete the picture of the principal industries. For a full description of this industry, see Supervisor of Banks, *Annual Report*, 2010, published in the summer, and Chapter 4, *The Financial System*, below.

[66] For further elucidation, see Chapter 5, *The Labor Market*.

Box 2.2
Scenarios for the rise in the number of hotel rooms in Israel, 2011-2015

International tourism in general, and hotel hospitality in particular, represents an important industry with regard to the extent and share of global exports, and its share of global GDP is growing. In Israel the added value of tourism services, including services to Israeli tourists and flight services, was estimated at some NIS 12 billion in 2007,[1] constituting about 2 percent of GDP at basis prices. The large proportion of persons without an academic education as well as of persons from the periphery is a prominent feature of employment in this industry. These characteristics of the composition of employment in tourism attests to the importance of this industry in Israel, over and above its contribution to growth, namely, its ability to provide employment for persons without higher education who, because of the technological advances of recent years, have a lower rate of employment than those with higher education.

Israel's tourism industry relies in both incoming tourism from abroad and internal tourism of Israelis. One of the main components of this industry is hotel bed-nights which, while accounting for only 30 percent of a tourist's expenditure in Israel,[2] the shortage of hotel rooms is a barrier to the development of the industry, which provides tourists with catering, transportation, commercial and other services as well as hospitality services.

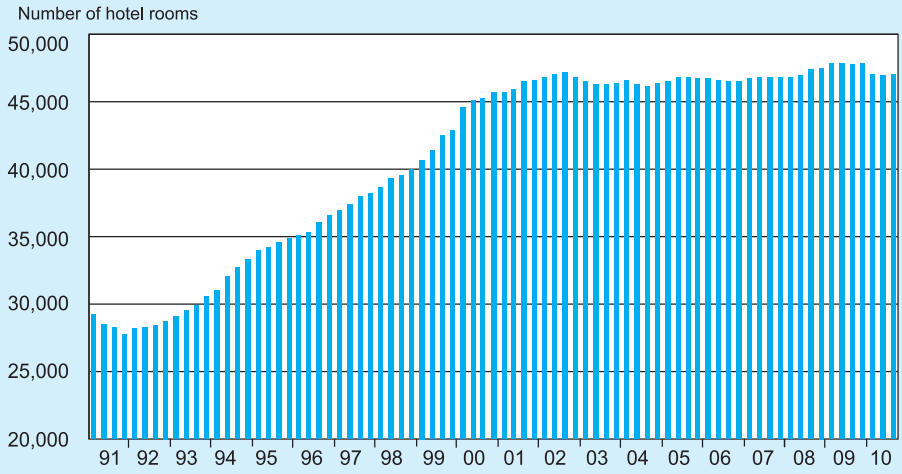
Figure 1 shows the number of hotel rooms offered in Israel by hotels defined as tourism hotels, from the beginning of 1991 to the end of 2009.

As may be seen from the figure, since 2001 hardly any new hotels have been opened in Israel, and the number of rooms has remained stable at about 47,000, after rising continuously in the 1990s. According to reports by the Central Bureau of Statistics (CBS), the number of rooms available in rural bed-and-breakfast establishments as well as those in hotels not defined as tourism hotels has remained virtually unchanged in the last five yeas, standing at 7,600 and 4,800 rooms respectively, at a time when the number of rooms has risen in most of the developed countries, particularly those around the Mediterranean basin, in response to the upward trend in the demand for tourism services.

[1] The data relate to 2007 because that is the last year in which the satellite account of tourism in Israel was made according to the Tourism Value Added (TSA) method developed by the World Tourism Organization (UNWTO), making it possible to compare countries with regard to the extent of the industry. A detailed account is to be found in: D. Frieman, "The Effect of Tourism in Israel on the National Economy, a Calculation of the Output Multipliers, Product, and Employment in Tourism in Israel" (Hebrew), Association of Hotels and the Ministry of Tourism, 2010.

[2] In 2008 the average expenditure by a tourist in Israel was $ 1,200, $ 380 of it on accommodation. In addition, a tourist spent $300 on flight services via Israeli companies (this is an average expenditure, as some tourists buy flight services from foreign companies).

Figure1
Number of Hotel Rooms in Israel[a] 1991:Q1-2010:Q3



[a] In tourist hotels: hotels, guest houses, vacation villages, hotel apartments, and motels recommended for tourists by the Ministry of Tourism.
SOURCE: The Central Bureau of Statistics .

It is almost certain that in the wake of the decline in the number of tourists reaching Israel at the beginning of the 2000s because of the deterioration in the security situation, and in view of the only partial substitution between bed-nights of Israelis and of tourists, there was no need to increase the number of rooms. In the last few years, however, demand for bed-nights from both Israelis and tourists has risen in the context of the improvement in the security situation. This increase brings the situation regarding total bed-nights in recent years close to one of full occupancy,[3] mainly at peak periods and in certain parts of the country, such as Jerusalem and Tel Aviv. It is clear, therefore, that if demand from Israelis and tourists rises in the future, particularly if there is further improvement in the security situation or progress with the peace arrangements, it will be necessary to augment the number of rooms in order to meet the increased demand.[4] Note in this connection that the question of by how much to augment the supply of rooms in view of the rising demand is one of policy, as this industry is subject to planning. In order to build a hotel the government must: a. designate land for tourism purposes, because the competition for land use between tourism and residential construction impairs economic growth:

[3] Average occupancy of 60-70 percent in all parts of the country is considered to be full occupancy.

[4] The Ministry of Tourism assessment is that if the security situation remains calm an additional 1.6 million tourists will visit Israel in 2015, compared with 3.4 million in 2010.

an entrepreneur earns more from residential construction than from building a hotel, but the state earns far more from hotel construction because the product of hotel services is far higher than that of housing services,[5] and, as noted, the tourism industry is also the main provider of employment for persons without higher education and persons from the periphery; b. approve the plan for the construction of the hotel; c. provide an investment grant in many parts of the country.

The appropriate framework for examining the question of by how much to increase the supply of rooms is that of the long run, as the increment to hotel rooms (building hotels) is not immediate. Consequently, we constructed several simulations (scenarios) based on an empirical framework, in which we estimated the hotel market simultaneously on the demand side—of both tourists and Israelis—and the supply side.[6] The framework includes two groups of consumers—Israelis and tourists—who are influenced by different factors: the demand by tourists is affected primarily by the security situation,[7] as well as the price of a bed-night, the cost of a vacation abroad, the real exchange rate, and other factors. Demand by Israelis is affected by the cost of an alternative vacation abroad, the level of per capita GDP in Israel, and the price of a bed-night. Israelis and tourists differ in their sensitivity to the price of a bed-night as well as to security instability.

The simulation in Table 1 presents, under certain assumptions, the expected rise in demand by tourists and Israelis for bed-nights in the next five years (2011-15) and the number of hotel rooms that should be added to the existing stock in order to meet the increased demand. The scenarios include identical assumptions regarding the rise in per capita GDP (1.8 percent a year), and the alternative costs available to tourists for bed-nights abroad, as well as the global increase in per capita GDP (3.6 percent a year). We assume the relatively moderate effect of increased global economic growth on demand by tourists: the elasticity of income in the simulations is unitary, even though elasticity greater than one may be assumed, meaning that a hotel bed-night is a luxury item.

The scenarios are distinguished by the assumptions regarding the level of security instability, the trend of change in the real exchange rate, and the cost to Israelis of a vacation abroad. In scenarios 1 (the basic one) and 4 we assume that in the next five years the effective real exchange rate will remain unchanged,

[5] The return on labor in hotel services is much greater than it is in housing services.

[6] See R. Shaharabani and Y. Menashe (2011), "The Hotel Market in Israel" (Hebrew), Bank of Israel, Research Department Discussion Paper

[7] The index of security instability is a synthetic, non-linear index of fatalities based on figures of Israeli fatalities, including civilians killed in acts of terrorism, soldiers killed in action, and Palestinians.

while in scenarios nos. 2 (appreciation) and 3 (appreciation and the cancellation of the exemption from V.A.T.) we assume that the effective real exchange rate will appreciate by 2 percent in each of the next five years.[8] In scenario no.3 we assume that as of 2011:I the exemption for tourists from V.A.T. on hospitality and transportation services will be cancelled. The cancellation of the exemption from V.A.T. is translated into an increase of only 5 percent in the price of a bed-night for tourists.[9]

In scenario no.4 (deterioration in security stability) we assume that the level of security instability changes in the course of five years. The scenario assumes a marked deterioration in the situation at the end of 2011 which persists briefly, and an improvement in it one year late, so that the average for the entire simulation period in the level of security instability is that it is the same as its average in 1986-2010. In the other scenarios we assume that the level of terrorism in the next five years will be constant—the average level in 2008. Although this level is slightly below the long-term average from 1986 till today, it also includes the high level of security instability which prevailed at the end of 2008 because of the conflict in Gaza. In all the scenarios except no.4 the aim was to attain full occupancy at the end of the period.[10] In scenario no.4 the aim was to minimize the deviation from full occupancy—both upwards and downwards.

As Table 1 shows, in all the scenarios future demand for bed-nights by Israelis and tourists rises, but the extent of the increase is sensitive to various assumptions. In the basic scenario we find that in order to meet future demand it is necessary to increase capacity by a total of 9,000 rooms between 2011 and 2015.[11] In scenarios nos. 2 (appreciation) and 3 (appreciation and cancellation of the exemption from V.A.T.) we find that it is necessary to augment room capacity by 6,500 and 5,900 rooms respectively. In scenario no.4 (deterioration in the security situation) we find that it is necessary to increase capacity by 7,500 rooms. The increment of rooms obtained in these scenarios is significantly smaller than the assessment of the Ministry of Tourism regarding the need to increase the number of hotel rooms by 19,000 in the

[8] We also assume that the cost to Israelis of vacationing abroad will fall by 3 percent each year. This decline is comprised of a 1 percent reduction also assumed in the basic scenario and another 2 percent because of real local-currency appreciation.

[9] This estimate is based on the assumption that the cancellation of the exemption from V.A.T., and the consequent 1.6 percent rise in the cost of a bed-night for tourists, will not fully impact on demand by tourists. We assume, therefore, that the relevant price of a bed-night in the demand equation of tourists expresses all the costs of a visit (including the flight), which, as stated, will increase by only 5 percent.

[10] Full occupancy was defined as the average of the occupancy rate in 1999 and that of 2008, which was the peak year for tourism in the scenario of a deterioration in the situation.

[11] According to Ministry of Tourism reports of hotels under construction or closed for redevelopment, the number of rooms in various stages of construction is far greater than our forecast of the number required. However, experience shows that only some of the plans are implemented, and this is dependent inter alia on demand from abroad connected with the security situation.

Table 1: Different Scenarios in the Hotel Sector 2011–15

Scenario I – Basic	Scenario 2 – Appreciation in the real exchange rate[a]	Scenario 3 – Appreciation in the real exchange rate and elimination of the VAT exemption for tourists[b]	Scenario 4 – A Worsening in security situation
In order to supply the future demand from Israelis and tourists, hotel capacity should be increased in 2011–15 by a total of:			
9,000 rooms	6,500 rooms	5,900 rooms	7,500 rooms
The price for Israelis would decrease each year by:			
0.2 percent	0.5 percent	0.6 percent	0.25 percent
Estimate of the number of Israeli and tourist bed nights in 2015, compared with the base year (2008), when there were 11,403 Israeli bed nights and 10,150 tourist bed nights.			
Israelis Tourists	Israelis Tourists	Israelis Tourists	Israelis Tourists
13,821 11,855	13,677 10,825	13,718 10,526	13,975 11,168

a By 2 percent a year.

b Increasing the rate for tourists by 5 percent.

next five years if the security situation does not worsen. In scenarios nos. 2 and 4, which include factors acting to reduce demand, mainly of tourists (deterioration in the security situation, real appreciation, and cancellation of exemption from V.A.T.) the share of Israelis' bed-nights in total bed-nights increases relative to the basic scenario because of the partial nature of the substitution between bed-nights of Israelis and of tourists.[12]

Note that the simulation was run for the economy as a whole, not on a regional basis or one relating to types of tourism (vacation, business, pilgrimage). Thus, the results of the scenarios should be viewed solely at the national level, and not as specific recommendations as to where hotels should be built. Naturally, the considerations for choosing where to put a hotel should also be broader, taking into account the fact that the value added of a tourist's visit to Israel is greater than that of an Israeli's bed-night.

[12] The price of a bed-night for Israelis declines each year relative to the basic scenario because of the reduction in the number of tourist bed-nights due to the appreciation or the deterioration in the security situation, in order to fill the empty rooms with Israelis. In the last scenario, with a decline in the security situation the difference between the price of a bed-night for Israelis and tourists narrows because of the change in the nature of tourism: in such years fewer tourists come for vacation and pilgrimage purposes and more for business purposes, the latter being less sensitive to terrorism.

4. infrastructure industries: activity, investment, and regulation

The product of the transport industry, which constitutes some 6 percent of business-sector product, soared by almost 10 percent.

The activity of the transport and communications industries: The product of the transport industry, which constitutes some 6 percent of business-sector product, soared by almost 10 percent, after declining by about 5 percent in 2009 (Table 2.17).

In the wake of the expansion of economic activity, the product of the land transport industry rose by 9 percent.

In the wake of the expansion of economic activity, the product of the land haulage industry rose by 9 percent, reflecting a sharp increase in the product of the truck industry,[67] and a moderate rise in the product of buses, taxis, and trains. The expansion of the activity of the bus industry apparently stemmed from the expansion of demand by domestic passengers and tourists. The increase in the number of domestic passengers reflects the expansion of employment in industries where workers are not highly educated—as this segment of the population uses buses. The product of sea and air freight rose as a result of the marked increase in activity—the haulage of freight and passengers to and from Israel, and by Israeli companies on international lines—relative to the slump of 2009.

The product of the communications industry rose by 5.1 percent in 2010.

The product of the communications industry, which accounts for 4 percent of business-sector product, rose by 5.1 percent in 2010, reflecting an increase in the use and penetration of new products. The pace of penetration of the mobile telephony, high-speed internet, and multi-channel television industries has already reached saturation, so that the increase in the number of subscribers in the first two in 2010 was only 3 percent, and even declined in the last. Hence, a significant part of the rise in the industry's income derived from the introduction of new products.

The infrastructure: the transport and communications, energy and water industries are infrastructure industries which have a positive external effect on the economy as a

Table 2.17
Transport and Communications, Main Indicators, 2010

(annual change, percent)

	Share in total commerce and services product (%)	Product	Real wage per employee
Transport and communications	100	7.9	5.9
Communications	41	5.1	2.4
Transport and storage	59	9.8	6.8
of which Buses, taxis and trains	14	3.1	10.6
Trucks	18	13.2	
Air and sea transport, airports and seaports	13	9.1	22.5

SOURCE: Central Bureau of Statistics.

[67] The product of the truck industry is measured solely as the product of haulage companies, which is only part of the activity of trucks. Companies with haulage input appear to prefer to have their own fleet of trucks, rather than resort to haulage companies. Thus, the product of trucks plummets during a recession and soars at a time of prosperity.

whole, and so their importance far exceeds their share in GDP. Thus, for example, an improvement in the quality of public transport and the roads infrastructure expands employment possibilities, improves the match between workers and firms, thereby increasing GDP and reducing unemployment. The fulfillment of the externalities of the infrastructure industries depends to a great extent on the government's regulation and supervision (for further details, see below), and even on investment in the infrastructure that is initiated and encouraged by the government.

Infrastructure investment declined in 2010.

Infrastructure investment, which constituted 19 percent of investment in the principal industries in 2010, was down by 7 percent from 2009 (Table 2.18). The decline encompassed most of the main spheres: investment in transport declined, while that in communications rose slightly; investment in energy, comprising mainly investment in the oil and gas infrastructure, rose notably, while investment in water dipped as a result of the conclusion of several desalination investment projects. In the composition of infrastructure investment the transport industry played a prominent part, accounting for 40 percent, and energy also took a leading role, with a 14 percent share as a result of investment in the gas infrastructure.

The government acted to heighten competition in the communications industry.

Regulation of the communications industry: The government acted in 2010 to increase the efficiency of the industry and heighten competition in it. In the mobile telephony industry, which accounts for 55 percent of the communications industry, most indicators show that the level of competition between the cellular phone companies in Israel is not high. Its low level is expressed by: a. the low level of customers who leave a specific company (the churn rate)—the higher this is the greater is competition (Figure 27); b. a very high level of income per user of cellular phone companies in Israel by international standards;[68] c. a rise in the index of mobile telephony service prices in the last two years, after declining constantly since 2000.[69]

The government acted to reduce costs to consumers by drastically cutting interconnection fees. Until the end of 2010 these fees were higher in Israel than in Europe, even though the level of prices in Israel is lower. In the wake of the reduction, from the beginning of 2011 interconnection fees in Israel will be among the lowest in the world. The government also acted in various ways to heighten competition in the industry. These included: a. reducing the cost of moving from one cellular operator to another, from one internet provider to another, and also in multi-channel television; b. enabling the entry of virtual operators—operators who rent air time from a regular cellular operator (who owns an infrastructure)—as is customary in the OECD countries; this reform will improve competition in the industry without increasing the radiation which ensues when a regular operator enters the field; c. the regulation will make it possible to introduce a third land-line network in the

[68] The number of minutes per user is also high in Israel by international standards, but the marginal expenditure per minute is not high in the mobile telephony industry, and most of this expenditure is fixed, so that under conditions of competition a high usage rate does not necessarily entail a high cost to the consumer.

[69] Calculation based on CBS data.

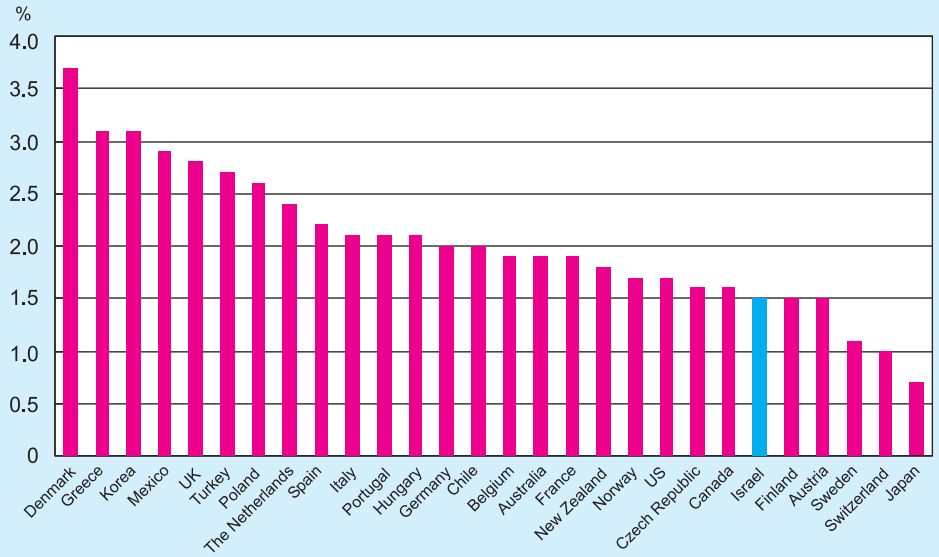
Table 2.18
Investment in infrastructure, 1995-2010

(annualized, percent)

	Total infrastructure	Communications	Transport					Electricity	Energy (oil and gas)	Water
			Total transport	*Of which* Land transport	*Of which* Roads	*Of which* Railways	*Of which* Seaports and Airports			
1995-2000	4.0	11.8	4.7	4.4	3.8	14.0	6.2	-1.9	-8.6	0.9
2001-2005	-3.0	-9.4	-2.4	-0.3	-12.2	40.9	-16.7	1.1	1.7	5.9
2005-2010	1.1	-0.5	0.7	-1.0	5.8	-10.0	17.5	-2.4	37.6	-7.2
2010	-6.8	2.2	-3.9	-12.2	-11.2	-14.5	110.7	-14.1	19.2	-40.4
2010 (NIS millions)	18,387	3,247	7,299	6,293	4,478	1,795	1,006	3,624	2,558	1,433

Source: Central Bureau of Statistics

Figure 2.27
Churn Rate[a] of Cell Phone Customers, by Country, 2009



[a] Or attrition rate: the percentage of customers leaving a service in a year.
SOURCE: Bank of America, Global Wireless Matrix 2010:Q3.

future, and this will compete with the infrastructures of 'Bezeq' and 'Hot,' as well as bringing in a new mobile phone operator with an infrastructure.

The green tax reform accorded a tax benefit to economic and non-polluting vehicles.

Regulation in the land transport industry: the green tax reform which went into effect at the end of 2009 accorded a tax benefit to economic and non-polluting vehicles (see, too, Box 6.3 in the chapter on *The General Government*). This gave rise to a notable increase in the share of small, economic, privately-owned vehicles in total vehicles purchased. The proportion of small vehicles,[70] which was 18 percent of all new vehicles purchased in 2009, rose to over 32 percent in 2010.

In the metropolitan area the public transport share of the market has declined, while that of private vehicles has risen.

Public transport: in public transport, mainly inter-city travel, new bus companies are now active in addition to the veteran 'Egged' and 'Dan' companies. Currently 20 percent of the lines are in the hands of the new companies. The reform which introduced the new companies enables better service and lower fares, and is suitable for the non-metropolitan area. In the metropolitan area, however, where extensive public transport has clear economic benefits, its share of the market has declined, while that of private vehicles has risen (see Box 1).

The functioning of the ports: since 2004, the year in which reforms were made, the organizational structure of Israel's ports consists of three government companies which operate the ports of Haifa, Ashdod, and Eilat, and a government company which administers, maintains, and develops the ports. The Shipping and Ports Authority in the Ministry of Transport is the supervisory body.

[70] Vehicles in groups 2 to 5.

Ships' waiting time was up in 2010 in light of the marked rise in the number of ships and the quantity of freight handled by the ports.

An examination of indices of the functioning of the ports over time (Table 2.19) shows that in 2010 the average output per hour in dock of ships declined, in the context of the marked rise in the number of ships and the quantity of freight handled by the ports. Thus, the amount of ships' waiting time was up in 2010 from 2009, the year of the crisis. Nevertheless, the share of night work in Israel's ports is very small, and it is recommended that steps be taken to encourage its expansion, thereby bringing down waiting times (see section on encouraging night work in the ports).

Competition between the ports is limited because most of the users are 'captive,' i.e., obliged to use a certain port, largely because of its geographic location.

Competition between the ports is limited because most of the users are 'captive,' i.e., obliged to use a certain port, largely because of its geographic location. There is great potential for competition between quays within a port, if each quay is operated by a different operator. In order to improve competition in the future it is important to act so that the future development of the quays is undertaken in the framework of a third entity, namely, in a way that is not linked to the existing port companies. Any

Table 2.19
Operational Facts about Israel's Seaports

	Average output per hour of ship dwell time in port (containers per hour)[c]		Number of container ships which visited the ports		Average number of containers handled (per ship)[d]	
	Haifa	Ashdod	Haifa	Ashdod	Haifa	Ashdod
2001	17.9	9.2	1,158	972	486	366
2002	18.5	11.1	1,373	1,137	439	332
2003	17.3	11.7	1,144	1,040	584	345
2004[a]	22.5	12.9	878	753	642	397
2005	24.2	14.5	1,247	1,066	581	375
2006[b]	22.0	17.9	981	840	638	461
2007	15.5	13.3	1,025	929	732	596
2008	20.8	18.6	1,118	981	727	569
2009	25.4	27.7	1,226	1,220	590	489
2010	24.5	24.4	1,208	1,292	675	524

[a] The data for 2004 is net of the effect of a strike.

[b] The data for 2006 do not include the third quarter, because of the Lebanon war.

[c] The number of hours from the time work started on the ship till the harbor pilot leaves the ship after guiding it out of the port and the ship sails.

[d] The measurement unit is a twenty foot equivalent (TEU) or forty foot container. For the average dwell time productivity index, it doesn't matter if it is a twenty foot or forty foot container.

SOURCE: The Ministry of Transport Shipping and Ports Authority.

privatization of the existing port companies should enable the future entry of third operators.

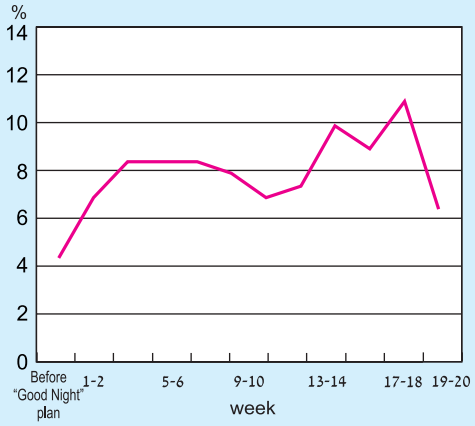
The reform of port charges: after many years in which port charges did not reflect their true costs, in October the reform of these charges went into effect, gradually increasing the cost of exports—which are currently subsidized by imports—and cheap freight, which is subsidized by expensive freight. Consequently, the competition may also extend to spheres which are currently considered to be unprofitable, such as freight exports. The reform of charges also makes it possible to encourage night work in the ports (see next paragraph).

Night work in the ports has significant externalities because it enables capital to be utilized also at night.

Encouraging night work in the ports: night work in the ports has significant externalities because it enables capital utilization at night, too. The work of the ports uses mainly the capital of the ports and the logistics chain associated with it, including roads and trucks which load and unload freight. One of the reasons for the inefficiency of Israel's ports is their very low output at night (between 10 p.m. and 6 a.m.): only 4 percent movement of containers—entry to and exit from the port gates—in Haifa port, and almost none in Ashdod port. Logistical activity at night would lead to the reduction of the queue to unload ships as well as to less road congestion. In other countries it is customary for the logistics chain, including ports, haulage companies, warehouses and manufacturers, to operate at night.

The reform of port charges in 2010:IV encourages—for the first time through charges—night work,[71] by setting a fee that was NIS 150 lower for each container entering or exiting the port by night, out of an average fee of about NIS 800 for handling a container, i.e., for the use of the infrastructure and for handling. This incentive led to a small increase in night-time activity at Haifa port, where there is a tradition of night work (Figure 2.28), from 4 percent before the incentive to about 8 percent, and to a smaller increase at Ashdod port. The incentive is expected to be reduced to only NIS 100 in 2011:II, compared with $ 50 per container at Los Angeles port.[72] If, as the data indicate,

Figure 2.28
Share of Containers Handled at Night,[a] 2010



[a] The number of containers handled in the Port of Haifa during the night shift (10:00 p.m. to 6:00 a.m.) divided by the total number of containers handled.

SOURCE: Israel Ports Company.

[71] An initial attempt to encourage night work at Haifa port, which was managed by the Israel Ports Company in conjunction with the Haifa Port Company and the Ministry of Transport, was implemented for a year until December 2008, after which the plan was to continue with night activity by means of charges—taking a lower fee for port services at night and a higher one at peak times. This plan was implemented via the reform of port charges in October 2010.

[72] See http://pierpass.org/offpeak-information/rules-regulations-and-rates/

the increase in night-time activity is not adequate, it is possible, for example, to increase the charges for users at peak periods, and thus to increase the subsidization of the night-time rates.

Night-time activity has to overcome barriers primarily of factory warehouses, a part of the logistics chain that hardly works at night. Thus, for example, a factory warehouse will be opened at night only if there is sufficient consistent demand for it. Hence, in addition to the financial incentive to the owner of the container, it is necessary, at least at the start of the experiment, to subsidize the activity of the logistics chain, especially of the warehouses,[73] in order to make night work more efficient.

Reducing the price of air transport will increase tourism and goods exports, make the economy more open, and improve consumers' welfare.

Regulation of air transport: reducing the price of air transport will increase tourism and goods exports, make the economy more open, and improve consumers' welfare by reducing the price of imported goods and vacations abroad. Within the European Union and the US there is considerable competition between airlines because of two necessary conditions for competition—a flexible flight policy and extensive demand for air transport services, expressed in a large volume of flights, making it possible to sustain several carriers which compete with one another. In Israel, on the other hand, the level of competition does not appear to be high.

A series of government decisions in 2008 and the beginning of 2009 made flight policy more flexible by gradually making flight agreements more liberal. The agreements in some countries enable several carriers to fly regularly and determine the quantity and frequency of flights by specific carriers without having to obtain a government permit. However, this trend was barely in evidence in 2010, and no liberal agreement is likely to improve competition between Israel and various other countries, among them the Netherlands, Greece, Romania, and Poland, with which air traffic to and from Israel is fairly intensive.

Electricity production capacity by means of gas-fired power plants increased in 2010.

The electricity infrastructure: in view of the rise in demand for electricity and difficulties in approving a coal-operated plant, an emergency program to increase the production capacity of the Israel Electric Corporation by means of gas-fired combined-cycle power plants, which can be built relatively quickly, was implemented. The implementation of this program increased production capacity by 3 percent in 2008, 2 percent in 2009, and another 10 percent in 2010. The availability of gas by means of the gas-conducting system (see next section) and its low cost relative to industrial oil, was expressed in the conversion of electricity generating plants from industrial oil to the use of gas (Table 2.20).

The Sheshinski Committee concluded that the tax burden on oil and natural gas should be raised, as is customary elsewhere in the world, so that the state can also benefit from the discoveries by means of appropriate taxation.

Energy: the main development in this industry in 2010 was the discovery of enormous gas reserves (the 'Tamar' reservoir and the 'Leviathan' reservoir). This development required the re-examination of the tax burden on the state's natural resources, and the 'Committee to Examine Fiscal Policy Regarding Israel's Oil and Gas Resources' (the Sheshinski Committee) was set up. The committee concluded, at the beginning of 2011, that the tax burden on oil and natural gas should be raised, as is customary

[73] In this way trucks can take containers to and from the port, i.e., not travel empty.

Table 2.20
Distribution of the Israel Electric Corporation Electricity Generating Capacity,[a] by Types of Fuel (percent)

	2003	2008	2009	2010
Gas	0	15	35	40
Coal	48	42	41	38
Fuel oil	22	5	4	3
Diesel oil	31	39	20	19
Declared capacity (MW)	10,117	11,430	11,664	12,769

[a] There are hardly any private electricity generating companies.
SOURCE: Israel Electric Corporation.

elsewhere in the world, so that the state can also benefit from the discoveries by means of appropriate taxation.

Alongside the discovery of gas, the dispersal of the system for transporting natural gas, which already connects most areas in Israel, has made it possible to increase resort to natural gas for 14 percent of energy use in Israel in 2009 and 17 percent in 2010, primarily for the generation of electricity and consumption by large industrial plants. Natural gas is an alternative energy source to oil and refined products in industry and for the generation of electricity. Its advantages are its far lower cost than that of oil and lower damage to the environment. The demand for natural gas forecast by the Ministry of the Infrastructure indicates that its use will soar from 5.3 BCM a year in 2010 to 11.1 BCM in 2020, while consumption of energy from other sources will rise by far less. This increases the intensity of gas used in generating electricity, as well as for other uses, such as industry.

Alongside the discovery of gas, the dispersal of the system for transporting natural gas, which already connects most areas in Israel, continued.

Water: consumption of fresh water in 2009 stood at 1,164 cu.m., down by 13 percent from 2008, 58 percent of it for the household sector. In the last few years there has been a shortage of water because of particularly dry years and also because water rates did not reflect the damage caused to the reservoirs because of the use of water when the reserves were low. Because of this shortage the government decided in 2008 to increase the water supply by desalination, and the amount of desalinated water rose to 600 cu.m. (Table 2.21).

Together with the increase in supply the decision was made to reduce demand by a policy of rates. The Committee to Reform Water Rates[74] determined that the real cost of producing water, especially desalinated water, should be internalized via rates, otherwise there would be excess demand for water—reducing the government's support for the industry. Thus, in accordance with the outline formulated by the committee, water and sewage rates for household consumers were raised by about 40 percent at the beginning of 2010. It was found that a 1 percent rise in the water rate

In the last few years the water industry has undergone a structural change, with authority for the sphere being transferred from various entities to a central Water Authority, in which all authority is now concentrated.

[74] The Water Authority, The Reform of Water Rates, Final Report (Hebrew), January 2010.

Table 2.21

Water Desalination

	Capacity of seawater desalination plants (million m3)	Increase in capacity since end of previous year (million m3)
2008	130	130
2009	140	10
2010	270	130
Forcast		
2011	287	17
2012	287	0
2013	412	125
2014	537	125

[a] Capacity is the water production ability during 20–25 years, according to the conditions detailed in the agreement with the state. Production usually takes place at night, when electricty is cheap and available, as per the commitment in the agreement.

SOURCE: The Water Authority.

beyond the increase in the CPI reduced per capita water consumption by 0.3 percent.[75] This has led to the reduction of per capita water consumption in the household sector in the last two years.

Consumption of fresh water declined significantly in 2009.

Regulation of the water industry: in the last few years the water industry has undergone a structural change, with authority for the sphere being transferred from various entitities to a central Water Authority, in which all rights are now concentrated, including the determination of rates, allocation of water, approval of investments in the water and sewage infrastructure, and planning the water system. An important principle of the new arrangement is that the Authority which approves investments also determines water rates. Thus, the Authority must balance the desire to increase investment in the water system with the resultant rise in the price of water. The Water Corporations Law of 2001 removed the issue of water from the local authorities and led to the establishment of water corporations. In the local authorities the corporations are responsible for supplying water and charging for it, as well as for investment in the water system and reducing depreciation. Currently there are about 50 regional water corporations, some of them very small, although the industry is characterized by increasing returns to scale.

The Water Corporations Law removed the issue of water from the local authorities and led to the establishment of water corporations.

[75] Examination presented in Bank of Israel, *Annual Report* for 2009, Chapter 2, p. 99.

Box 2.3
The structure of metropolitan transport in Israel from an international perspective:
The advantages of extensive and efficient metropolitan transport

An extensive and efficient public transport system has obvious economic advantages. Hence, governments almost everywhere in the world act to expand it and make it more efficient, particularly in metropolitan areas. The expansion of public transport requires sources of investment, subsidy, and regulation, while making it more efficient diverts sources. The operational efficiency of public transport reduces the subsidy to the industry, while expanding it makes it possible to reduce road congestion and improve the quality of the environment, supporting employment by improving the match between workers and firms, and aiding that segment of the population which is unable to buy a private vehicle and would like to participate in the labor market. In urban areas extensive public transport can lead to the concentration of areas of employment and increase population density, and this has significant economic benefits. It has been found that the elasticity of product to building density and/or population size in a city and/or the size of employment centers in a city is 0.13, due to the high elasticity in the services industries (0.2) and the low elasticity in the manufacturing industry (0.07) (Graham, 2007).

Policy methods for attaining an extensive and efficient metropolitan public transport system

In order for public transport to be extensive it is necessary to invest in the mass transportation system and establish dedicated lanes, to provide subsidies and an appropriate institutional structure that enables a fare structure that encourages the use of public transport.

In countries with a high or growing (as in Israel) level of motorization, competition from private vehicles requires a high quality public transport service so that use of the latter can compete with the former. A high level of service is usually obtained from a public transport system when it combines several features—underground trains, a light railway, or other means of mass transport in an urban center, as well as an extensive bus system in less central areas. Most metropolitan areas in developed countries have mass transportation systems, whereas in Israel public transport in the metropolitan area is provided almost solely by buses. In the last few years, however, there has been investment in mass transportation systems: in metropolitan Haifa three lines for a new bus rapid transit system of mass transport ('metronit') are currently under construction and the service is expected to go into operation at the end of 2012; in Jerusalem one line of the light railway is at the running-in stage, while in metropolitan Tel Aviv the construction of the light railway is subject to delay. In addition, it is

necessary to invest in public transport lanes, which have increased hardly at all in metropolitan Tel Aviv in the last few years. There is economic justification for according priority to public transport lanes, as the number of passengers which a public transport lane is able to move is far greater than that of a lane that is open to all forms of transport.

A government subsidy provides an incentive for preferring public transport to a private vehicle. This subsidy—expressed in the improved frequency and lower cost of the service—is viable because of the aforementioned benefits of an extensive public transportation system. Parry and Small (2007) found that the optimal subsidy is higher than 50 percent of the operating expenses of a public transport system.

An appropriate institutional structure also stimulates the use of public transport as well as making it more efficient. In Europe and the US the institutional structure includes a metropolitan authority, which is the regulator of public transport in the metropolitan area. The operator of a public transportation system may be public or private, and there various kinds of contracts exist between the operator and the regulator. A public operator can bring about extensive public transport, but is generally not efficient; private operators, chosen through competitive tenders, are more efficient (Pina, Vincente and Torres, 2006). However, when the operators are private they have to be integrated with one another so that it is easy for passengers to transfer from one system to another, and especially through an integrated fare system which encourages the use of the various forms of public transport at a low cost. An arrangement of this kind is possible if the operators reach agreement regarding joint ticketing.

Efficiency of the public transport system: a competitive contract enables the regulator to offer incentives to the operator to increase efficiency and also to expand the service. There are two main kinds of contract: net and gross. The contracts are limited in time, and every few years the tender is reopened for competition, so that the operators are obliged to increase their efficiency. In a net contract the operator obtains revenue from the passengers and bears the costs; there is high risk to the operator in this type of contract—revenue risk (the risk that sales of the transport services will be low), and production risk (the risk that production costs will rise for a given level of service provided). In a gross contract the operator does not obtain revenue from the passengers but is paid by the regulator per kilometer/bus, and its risk is lower—production risk only. Risk requires a premium, and so net contracts cost the regulator slightly more than gross contracts.

In a net contract the operator has an incentive to increase revenue, but if there are several operators in a dense metropolitan area they may disturb one another. Thus, for example, a bus operator will not be motivated to feed light railway lines, since they compete directly with it, and neither will it be motivated to feed a bus

operator that competes with it at the margin for passengers.[1] Moreover, in net contracts it is almost impossible to integrate the various public transport systems: when there are several revenue-sensitive operators it is almost impossible to get them to cooperate, and particularly to undertake joint ticketing (World Bank, 2002). Hence, contracts of this kind lead to public transport which operates efficiently but is not extensive.

A gross contract involves several problems: first, the operator who is paid per km./bus has no motivation to improve the service, to take fares (which are passed on to the regulator) from passengers, to increase capacity, or to locate public transport bottlenecks; second, these contracts require an effort on the part of the regulator to monitor and control the transportation system; third, since the revenue is in the regulator's hands, it is difficult to find an incentive to boost it, as a public entity's incentive to increase revenue taken from passengers is smaller than that of a business entity. The advantage of these contracts over net contracts is that they make it relatively easy to create an integrated fare structure: the operators do not need to settle accounts among themselves because they are paid per km./bus. A variant of the gross contract—a gross contract with incentives to improve and expand the service—represents an attempt to overcome these disadvantages: the operator is paid per km./bus but has an incentive (premium) to increase the number of passengers and improve the service (Table 1).[2]

Table 1 The Institutional Structure

	Public operator	Private operator, net contract	Private operator, gross contract	Private operator, gross contract with incentives
Public transport: extent and efficiency	Widespread, inefficient	Not widespread, efficient	Not widespread, efficient	Widespread, efficient
Management: Difficulty/effort to control franchisee	Low	Low-medium	High	High
Fares: difficulty in creating a combined tariff structure	Not difficult, (there is only one operator)	Almost impossible	Possible	Possible

[1] Obviously, operators have no desire to further the integration of the system, and their aim would seem to be the opposite.

[2] There are, of course, other topics, such as the length of the contract and barriers to entry into the market. For further elucidation, see Albalate, Bel and Calzada (2010).

Table 2
Structure of Metropolitan Transportation In israel and Other Countries

Country	Metropolitan area	Type of public transport	Operator	Modal split: share of public transport in km/ passenger: the largest town in conurbation	Modal split: share of public transport in km/ passenger: the conurbation	Daily ticket[a]	Combined ticket[b]	Subsidy: Share of proceeds from ticket sales	Subsidy: Share of operating costs	Type of bus contract,[c] gross or net	Are there incentives to increase the number of passengers?
The Netherlands	Amsterdam	Bus, metro, tram		47.6	16.4	Yes	Yes	161.7	61.8	Net	
Spain	Barcelona	All	Public and private[d]	64.7	37.7	Yes	Yes	79	44.1	Gross[i]	Yes
Germany	Berlin	All	Public	33.3	11.7	Yes		90.3		Gross[g]	
UK	Birmingham	Bus, tram, suburban railway	Private		12	Yes					
Belgium	Brussels	Bus, metro, tram		30.7		Yes	Yes	171.2	52.6		
Germany	Frankfurt	All	Public			Yes		113	52	-	
Finland	Helsinki	All	Public and private	64	37.8	Yes	Yes	76.9	43.5		Yes
UK	London	Bus, metro, tram	Private	65[e]	47.4	Yes		87.7	44.5	Gross	
Spain	Madrid	Bus, metro, suburban railway	Public	63.6	49.5	Yes	Yes	124.9	55.5	-	
UK	Manchester	--[f]	Private		12.9						
Canada	Montreal	Bus, metro, suburban railway		28.4	17.4	Yes		74.9	39.6		
France	Paris	All	Publich	63.6	29.4	Yes	Yes	142.8	56.4	-	
Spain	Seville	Bus, suburban railway			19.8						
UK	Sheffiled	--[f]		29.4	21.3	Yes					
Sweden	Stockholm	All	Private	56	35.4	Yes		113.3	41	Gross	
Germany	Stuttgart	All	Public	32.8	18.1	Yes	Yes	40.7	24.2	-	
Italy	Torino			31.1	22.8	Yes	Yes			Gross	
Spain	Valencia	Bus, metro, tram		39	23.4	Yes	Yes	125.1	55.6		
Austria	Vienna	Bus	Public	50.7	30.1	Yes	Yes	59.9	22.8	-	
Israel[k]	Tel Aviv	Bus, and in the future, tram	Private			No	No			Net	
Israel[k]	Jerusalem	Bus, and in the future, tram	Private			Yes	Yes (partial)[j]			Net	

a A combined daily ticket accepted by all operators.
b Relevant when there are several operators.
c In Central London.
d Relevant when there is a private operator.
e The public operator aperates in the town and the private operator serves between the town and the suburbs.
f There is no supervision.
g Changed to gross in 2004.
h Private operator in the outskirts.
i A type of gross contract.
j Hourly ticket.
k For greater detail see the equivalent section in the Bank of Israel Annual Rerport for 2009.
SOURCE: See References at the end of this Box.

International comparison

An extensive public transport system can generally be found if the subsidy is high and the operator is public or—if there are several operators—if the operators are private and have a gross contract (Table 2). In the last few years we have witnessed a trend of shifting away from public (or historic) operators to private ones, in order to make public transport more efficient.

Subsidy: the average subsidy in metropolitan Europe was over 50 percent, and in the US it reached 75 percent. In cities where there is no subsidy public transport is very limited (EMTA, 2009; Parry and Small, 2007).

Type of operator: in some parts of metropolitan Europe reforms have been introduced transferring part of the market from historic, usually public, operators to private ones. This transition has led to lower costs of the service, since private operators are, as stated, more efficient. When the government's objective is to reduce the subsidy, as is the case in England (outside London), the government privatizes the service, so that the number of passengers using public transport plummets (see the example of Manchester in Table 2). In the US it is more common to find a public operator or a structure which includes one large public operator and several small private ones. Structures of this kind are not as a rule efficient (Roy and Yvrande-Billon, 2007).

Kind of contract: in most European countries when the operator is private the contract is of the gross kind. Gross contracts with incentives are accepted in the leading metropolitan areas of Europe—London, Barcelona, etc.

The structure in Israel

Public transport in Israel was historically in the hands of two large private operators, 'Dan' in metropolitan Tel Aviv, and 'Egged' in metropolitan Jerusalem and Haifa and the non-metropolitan areas. These operators have net contracts. In recent years some 20 percent of the lines, a considerable part of them within the metropolitan area, have been transferred to new private operators. The new operators were introduced via the franchise system under net contracts. The share of public transport in total kilometers driven in the metropolitan area has fallen,[3] in contrast with the situation in the leading metropolitan areas of Europe.

Efficiency: the entry of additional operators created a benchmark of income and expenditure in the operation of lines. This enabled the regulator to bring about the reduction of the operating costs of buses relative to the historic operators, create a competitive threat to them, and thereby to increase the efficiency of the historic operators, too.

[3] The index of kilometers driven by private vehicles is rising faster than that of buses on permanent lines.

The regulator: the main tools in the hands of the regulator are competition agreements to transfer clusters of lines from the historic operators to the new ones, and subsidy agreements to regulate the subsidy with the historic operators. In order to choose the new operators competitive tenders are held, and the winners sign contracts which relate to the frequency and routes of the lines, fares, the subsidy, etc. The historic operators in Israel are also subject to regulation regarding fares, routes and frequencies of lines, so that the bus companies do not appear to be able to reduce the frequency of the buses on the routes. However, it is reasonable to assume that they are able to play with this at the margin.

Subsidy: the subsidy agreements with the historic operators include protection if revenues fall below a certain level, but encourage the expansion of public transport hardly at all.

Integrative ticketing in the metropolitan area: the integration of the public transport system, and especially the introduction of integrated ticketing, could encourage resort to public transport. A ticket of this kind, as has been introduced in metropolitan Haifa and recently in Jerusalem, too (and will be introduced in Tel Aviv in the future) alters travel habits—increasing the extent of use of public transport, (Sharaby and Shiftan, 2011). Net contracts, in which the operator is not revenue-neutral, make it difficult to create joint ticketing among several operators. It is possible to create a ticket of this kind only if it does not have an adverse effect on the situation of each operator relative to the present situation, i.e., by protecting its revenue. Thus, the state protects the operator's revenue from below (as is the case in Haifa and Jerusalem), thereby bringing the operators closer to gross contracts (in which the operator is indifferent to both an increase and a decrease in revenue), but does not benefit from excess profits, if they exist.

Conclusions

Extensive and efficient public transport embodies obvious economic benefits. The government has improved the operating efficiency of the industry by means of competitive contracts, but the share of public transport in the metropolitan areas (according to modal split) is contracting because of the competition from private vehicles. This is in contrast with Europe, where the downward trend in the share of public transport has been checked, and in some metropolitan areas it has even risen. The expansion of the industry and the improvement of integration within it appears to involve, alonsgside a transition to gross contracts, the allocation of public transport lanes and, first and foremost, considerable investment in the public transport system in the three major metropolitan centers.

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