Chapter 7
The Balance of Payments

- The current-account surplus remained high at $6.7 billion in 2010, down slightly from the 2009 level. As a percentage of GDP, the surplus remained 3.1 percent.
- Israel had a trade surplus in 2009 and 2010 after many years of steadily declining deficits.
- Israeli exports were less affected by the crisis than those of other developed countries because the crisis caused only mild damage to high-tech industries.
- Israeli exports recovered more quickly than those of other developed countries, thanks to the growing share of Asian markets in exports and a rapid increase in exports of tourism and transport services.
- Capital inflows from developed countries to emerging markets, including Israel, increased in 2010. Monetary expansion in the United States, the Eurozone, and the UK instigated large capital flows from these countries to the rest of the world, including Israel.
- Rate-hiking in Israel, meant to prevent overshooting of the inflation target and to attenuate asset prices, had an upward effect on short-term capital inflows and currency appreciation.
- The Bank of Israel, like other central banks, sought to alleviate the adverse effects of short-term capital inflows on the exchange rate and exports by purchasing foreign currency and also, at a later time, by imposing a liquidity requirement on transactions made for capital-inflow purposes.
- According to an index developed by the International Monetary Fund, the Bank of Israel's "resistance" to capital inflows in 2010 was not exceptional by the standards of other countries that were the targets of such inflows.
- Israel's integration into global capital markets is weak by the standards of developed countries. Israelis' portfolio investments abroad (shares and bonds) are conspicuously small and their direct investments abroad are also relatively paltry.
- Although the offshore gas discoveries are expected to allow large-scale substitution of imported energy sources, the substitution is likely to have only a mild effect on currency appreciation. Only if exports of natural gas become profitable is major appreciation foreseen, inflicting significant damage on the tradable industries—the "Dutch disease."

Table 7.1
The Balance of Payments, Main Indicators

	2003-07	2008	2009	2010
	Annual rate of change, %			
Goods exports[a]	14.0	13.7	-19.7	21.7
World trade in goods[a]	16.5	15.6	-22.6	16.6
Services exports[a]	11.6	15.0	-9.6	12.2
Goods and services imports[a]	13.5	14.6	-25.1	20.4
Terms of trade	-1.2	1.8	10.4	-4.4
The real effective exchange rate	2.2	-10.7	1.8	-5.0
	($ billion)			
Current account	3.9	1.5	7.1	6.7
Goods and services balance	-0.5	-2.8	4.7	4.5
Net income account	-2.3	-4.1	-5.1	-6.2
Net current transfers	6.7	8.5	7.4	8.4
Capital account	0.7	1.1	-0.3	1.0
Financial account	-5.4	-1.6	-11.3	-9.1
Direct investments, net	0.3	3.7	2.7	-2.6
Net investments in tradable securities portfolio (excl. *makam*)	-0.4	-0.6	-6.8	-9.2
Other net investments and *makam*[b]	-4.9	9.6	9.5	14.5
Change in foreign exchange reserves	-0.4	-14.2	-16.8	-11.8
Statistical discrepancies	0.7	-1.1	4.6	1.5

[a] In doller terms.
[b] Including financial derivatives.
SOURCE: Central Bureau of Statistics and IFS.

1. THE CURRENT ACCOUNT

Israel continued to post a large current-account surplus in 2010, at $6.7 billion—slightly smaller than in 2009. As a percentage of GDP, the surplus remained 3.1 percent.

Israel continued to post a large current-account surplus in 2010, at $6.7 billion—slightly smaller than in 2009—and 3.1 percent of GDP. The stability of the current-account surplus was abetted by stability of the trade surplus, at $4.5 billion, as an increase in the deficit on the goods account—due to higher fuel prices—was offset by a surplus on the services account, which continued to trend upward. As for the two other components of the current account, the deficit on income account grew in 2010 but was canceled out by an equal increase in the surplus on current transfers account. The slight decline in the current-account surplus in 2010 brought the upward trend in this indicator to a halt, after the deficit began to contract in the mid-1990s and transitioned to a surplus upon the exit from the recession at the beginning of the current decade.

Current-account developments in 2010 were also influenced by events abroad, specifically the recovery from the global crisis. Israeli exports claimed a growing share in the developed countries' imports and exports during the crisis due to the large share

of high-tech industries, which were less harmed by the crisis, in the country's exports, thus explaining the relatively moderate effect of the crisis on Israel. During the recovery period, the share of Israeli exports in developed countries' trade continued to increase due to the relatively swift recovery of these exports. The recovery is attributed to the exports of tourism and transport services, of all things, which advanced at a faster pace than global trade—partly as a correction from their low level in 2009 due to Operation Cast Lead. Another contributing factor in the rapid recovery of the Israeli economy was its ability to redirect exports from one part of the world to another. During 2010, the share of Eastern markets in Israeli exports grew more vigorously than their share in global trade and that of Western markets decreased commensurably. This structural change is perceived as a permanent one that is not expected to undergo a correction, unlike the rapid increase in exports of tourism services, which may be temporary.

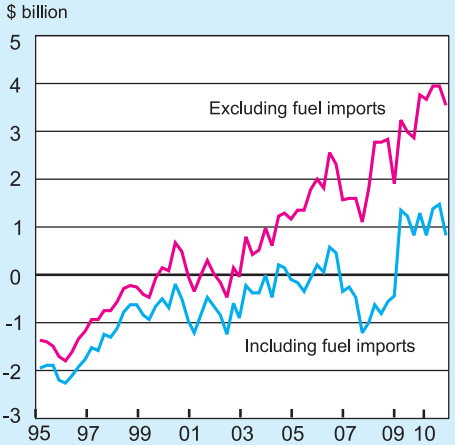
The proportional growth of Israeli exports in the imports and exports of trading partners in recent years despite real currency appreciation may trace to a stronger upturn in the productivity of the domestic tradable industries than in that of non-tradable industries. A comparison between Israel and the US in the relative productivity of tradable industries suggests that real pressures toward real appreciation of the shekel may be at work. (See box in Chapter 2.)

a. The trade balance and the terms of trade

Israel enjoyed trade surpluses in 2009 and 2010 after many years of steadily contracting deficits [Figure 7.1]. The surplus in 2010, $4.6 billion, approximated the previous year's level. Many changes in the trade balance in recent years were brought on by the dramatic changes in global fuel prices. Net of these changes, the upward trend in the surplus was more stable, continuing in 2010 despite real currency appreciation and the worsening of terms of trade.

The year's developments on goods account may be divided into price effects and quantity effects.[1] The price effect is described in Figure 7.2, which presents Israel's terms of trade including and excluding fuel prices[2]: in 2010, the terms of trade worsened by 4.4 percent, reducing the trade surplus by $2.6

Figure 7.1
Trade Balance With and Without Fuel Imports, 1995-2010
(Billion $, seasonally adjusted)



SOURCE: The Central Bureau of Statistics.

Many changes in the trade balance in recent years were brought on by the dramatic changes in global fuel prices. Net of these changes, the upward trend in the surplus was more stable, continuing in 2010 despite real currency appreciation and the worsening of the terms of trade.

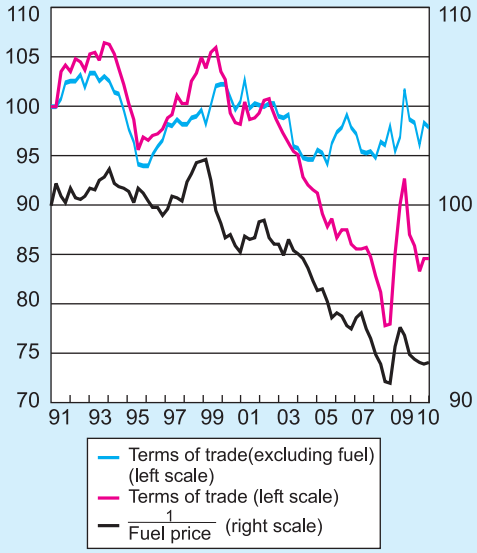
The worsening of the terms of trade in 2010, occasioned mainly by a 25 percent increase in fuel prices relative to 2009, cut $1.9 billion off the surplus.

[1] Price indices for trade in services do not exist.

[2] Terms of trade are defined as export prices divided by import prices. Since Israel is a net importer of fuel, fuel prices are entered into the terms of trade as a denominator. To demonstrate the relation between terms of trade and fuel prices, the diagram also contains a series of 1 divided by fuel prices.

billion. The trade data net of fuel elicit a more stable indicator over the years, in which a relatively mild downturn in 2010 reduced the surplus by about $0.7 billion.[3] Therefore, the worsening of the terms of trade in 2010, occasioned mainly by a 25 percent increase in fuel prices relative to 2009, cut $1.9 billion off the surplus by lowering the value-added of exports. A Bank of Israel examination in 2010 shows that Israeli exports have a 60 percent value-added rate: 52 percent in goods and 70 percent in services.[4] The worsening of terms of trade in 2010 reduced the value-added of total exports by about 2 percent, assuming that the increase in the prices of imported goods used for exports resembles the increase in import prices at large.

Figure 7.2
Indices of Israel's Terms of Trade[a] and Fuel Prices, 1991-2009
(1991 = 100)



[a] Excluding ships, aircraft and diamonds.
SOURCE: Based on Central Bureau of Statistics.

b. Developments during the year

Exports and imports increased vigorously in the first quarter, more slowly in the second and third quarters, and again rapidly in the last quarter.

The trade balance was stable in 2010 due to similar increases in exports and imports relative to the previous year. Importantly, however, developments during the year were uneven: exports and imports increased vigorously in the first quarter, more slowly in the second and third quarters, and again rapidly in the last quarter. The mid-year slowdown may have traced to the deceleration in global trade at the time; it also may have been a correction to the faster recovery of exports than of global trade in late 2009. A third contributing factor to the slowdown was the approach of the Israeli economy to full production potential, a development that had an upward effect on local costs (relative to costs abroad, which, of course, it did not affect) and was reflected in real appreciation. The growth slowdown of manufacturing exports in 2010 induced a similar decline in the growth of imports of industrial raw materials, which account for 60 percent of Israel's imports of goods. The growth rate of imports of consumer and capital goods also slowed during the year, despite the currency appreciation and the approach of the economy to its potential production. This, however, probably happened because imports of these components had been strong relative to previous levels despite the slowdown.

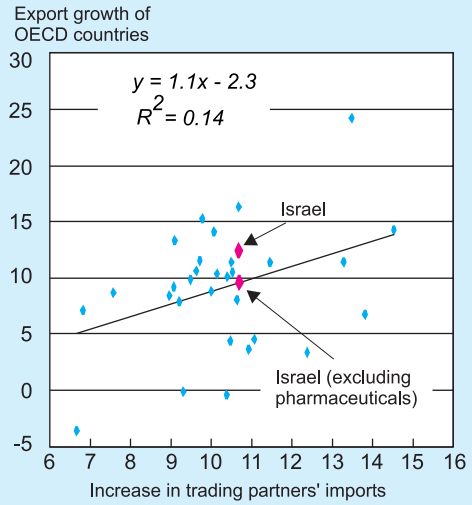
[3] The share of fuel in imports of goods has been around 18 percent in recent years.

[4] For specifics, see Recent Economic Developments, #129, February 2011, Part 2, "An Estimate of the Value Added of Exports," in Survey of Developments.

c. Exports and world trade

Exports increased by 19 percent (in current dollars) and by 15 percent in real terms despite real appreciation and the worsening of terms of trade. Israel's export performance was aided by the ongoing recovery of its trading partners from the global crisis: world trade expanded by 11.3 percent in real terms and trading partners' imports grew by 10.7 percent. The difference between the rates traces to the relatively small share of the faster-growing Asian countries in Israeli exports. Examination of the rates of change in OECD countries' real exports as against imports to each country's trading partners shows that much of the development of exports was powered by an increase in trading partners' demand (Figure 7.3). Even so, the growth rate of Israeli exports in 2010 surpassed that of the trading partners' imports. Although the difference was not statistically significant, the real currency appreciation that occurred in 2010, which could have dealt a blow to exports, makes it all the more valid. In greater detail, the rapid increase of Israeli exports in 2010 was powered by an aberrant upturn in pharmaceuticals; net of this industry, the rate of increase corresponded to that of the trading partners' imports—around 10 percent.

Figure 7.3
Export growth of OECD countries and import growth of their trading partners
(Rate of change between 2009 and 2010)



[a] The volume growth in the goods and service s export target market calculated as the increase in imports in each country's trading partners.
SOURCE: WEO.

(1) Crisis and recovery in Israel and abroad

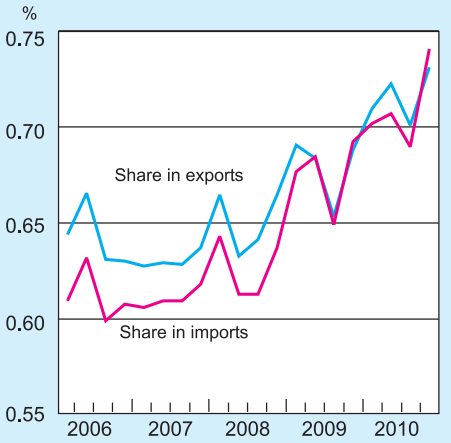
Israel's export performance was aided by its trading partners' ongoing recovery from the global crisis.

The economic crisis that erupted in late 2008 and the recovery that followed affected Israel in various ways, including changes in its trading partners' demand for goods and services. Israel's main trading partners are the developed countries, to which more than 80 percent of Israeli exports are destined. The crisis had less of an effect on Israeli exports than on the developed countries' trade and Israeli exports recovered more quickly than these countries' trade did even thought the NIS appreciated during the recovery. This outcome was reflected in a proportional increase in Israeli exports in the developed countries' international trade during both the crisis and the recovery (Figure 7.4).[5] It bears remembering that the share of Israeli exports in the developed

[5] The proportional increase in imports relative to the pre-crisis level mirrored rapid increases in exports of services and of non-manufacturing goods.

countries' trade had been declining steadily from 2000 to mid-2007; since then, the trend has been moving in the opposite direction.

Figure 7.4
Share of Israel's Exports in OECD Imports and Exports, 2006-10



SOURCE: OECD.

To compare Israeli exports with other countries' exports and to provide the background of developments in international trade, Table 7.2 shows the development of trade in goods and services in Israel, the OECD countries, and the BRIC group of emerging markets from the eve of the crisis in the second quarter of 2008 to the third quarter of 2010 (in current dollars). The table shows that the emerging markets' trade was less affected by the crisis than that of the developed countries (declines of 25 percent and 30 percent, respectively, in exports of goods and services) and that the emerging markets recovered from the crisis more quickly. Thus, developed markets' exports gained 15 percentage points since the crisis while those of emerging markets went up by 21 percentage points, even though the decrease during the crisis had been milder among the latter class of countries, as stated. Another finding in the table is that world trade in services was less badly affected by the crisis than trade in goods—a phenomenon evident in all countries' exports and imports. Accordingly, trade in goods rebounded more quickly than trade in services, bringing the levels of world trade in goods and services relative to their pre-crisis levels into approximate alignment at the present writing.

In 2010, exports steadily approached the high level attained in the second quarter of 2008, immediately before the crisis, and came to 94 percent of that level in the third quarter of 2010.

The development of Israeli exports from the second quarter of 2008 to the third quarter of 2010 resembled that of emerging markets' exports more than it did those of developed markets. In 2010, exports steadily closed in on the high level attained in the second quarter of 2008, immediately before the crisis, and came to 94 percent of that level in the third quarter of 2010. The proportions of exports in that quarter relative to the pre-crisis level were 96 percent among emerging markets and 85 percent among developed countries.

However, the composition of Israeli exports in terms of goods versus services actually resembles that of a developed market—a similarity mirrored in the high share of exports of services as against lower shares of services in emerging markets' exports.[6] The proportion of services in Israel's exports is 30 percent as against 23 percent on OECD average, and that of emerging markets is only 10 percent. This highlights the

[6] The composition of Israel's manufacturing exports in terms of technology intensity also resembles that of OECD members. High-tech industries are dominant in developed markets' exports; traditional industries dominate in exports of emerging markets.

Table 7.2
Imports and exports: Israel, OECD, and BRIC[a] countries during the crisis[b] and recovery[c]
100=2008:Q2

(Indices based on dollar figures)

	Israel			OECD			BRIC		
	Share of trade[d]	Crisis	Recovery	Share of trade[d]	Crisis	Recovery	Share of trade[d]	Crisis	Recovery
Export					(percent)				
Total	100%	76	94	100%	70	85	100%	75	96
Goods	70%	67	91	77%	68	84	90%	74	96
Services	30%	87	102	23%	81	86	10%	81	100
Import									
Total	100%	68	84	100%	68	83	100%	76	111
Goods	76%	62	82	80%	65	82	86%	73	111
Services	24%	89	90	20%	81	87	14%	94	108

[a] Brazil, Russia, India and China.

[b] From 2008:Q2 to 2009:Q2.

[c] From 2008:Q2 to 2010:Q3.

[d] Two years before the crisis.

SOURCE: The Central Bureau of Statistics, OECD, Eurostat, USITC, IFS, and central banks of BRIC countries.

emerging markets' comparative disadvantage and the developed markets' comparative advantage in exports of services; it also shows that Israel's comparative advantage in services exports exceeds the OECD average, as reflected in the high proportion of services in Israel's total exports.

Israel's comparative advantage in exports of computer and R&D services reflects its comparative advantage in high-tech industries, which is itself reflected in the composition of Israel's goods exports.

Israel's most salient comparative advantage in exports of services is in computer and R&D services. Net of its abundant exports of these services, the share of services in its exports resembles the OECD average. Israel's comparative advantage in exports of computer and R&D services reflects its comparative advantage in high-tech industries. This advantage is also manifested in the composition of Israel's exports of goods, in which high-tech accounts for 26 percent of total Israeli exports as against 22 percent on OECD average. The effect of the crisis on world trade was weaker in high-tech than in other industries. Thus, among the developed markets, high-tech exports fell to 82 percent of the pre-crisis level whereas manufacturing exports at large dropped to 70 percent, and software services exports in developed countries fell to 82 percent, and declined to 81 percent of total exports of services. It was this relatively mild blow to world trade in high-tech, which accounts for a large share of Israeli exports, which explains why the adverse effect of the crisis on Israeli exports was as mild as it was.

As the recovery proceeded, Israel's exports regained 16 percentage points from their lowest point during the crisis, more than the OECD average. In our estimation, two

Table 7.3
Development of Israeli export components, and OECD import and export components during the crisis[a] and recovery[b]
100=2008:Q2

(Indices based on dollar figures)

	Israel Export			OECD Export			OECD Import		
	Share of trade[e]	Crisis	Recovery	Share of trade[e]	Crisis	Recovery	Share of trade[e]	Crisis	Recovery
					(Percent)				
Goods	70%	67	91	80%	65	82	77%	68	84
Manufacturing excluding diamonds[c]	52%	77	95	70%	70	95	69%	69	88
High-tech[c]	26%	98	114	22%	82	107	18%	74	89
High-tech excluding Intel and pharmaceuticals[c]	16%	92	110						
Medium-high-tech[c]	15%	65	84	22%	62	84	32%	67	87
Medium-low-tech[c]	8%	52	72	10%	58	82	9%	64	81
Low-tech[c]	3%	85	94	16%	79	107	10%	75	93
Services	30%	87	102	20%	81	87	23%	81	86
Services excluding start-ups[d]	30%	90	103						
Tourism[d]	6%	83	113	5%	81	110	5%	80	116
Transport[d]	5%	58	83	11%	88	94	5%	69	87
Business services[d]	20%	120	106	4%	65	85	12%	84	95
Software[d]	7%	94	108	1%	92	99	1%	87	92
R&D[d]	3%	138	89	1%	-	-	1%	-	-

[a] From 2008:Q2 to 2009:Q2.

[b] From 2008:Q2 to 2010:Q3.

[c] OECD trade includes the US and EU 25.

[d] OECD trade includes the US, EU 25, and Japan.

[e] Two years before the crisis.

SOURCE: The Central Bureau of Statistics, OECD, Eurostat, USITC, IFS.

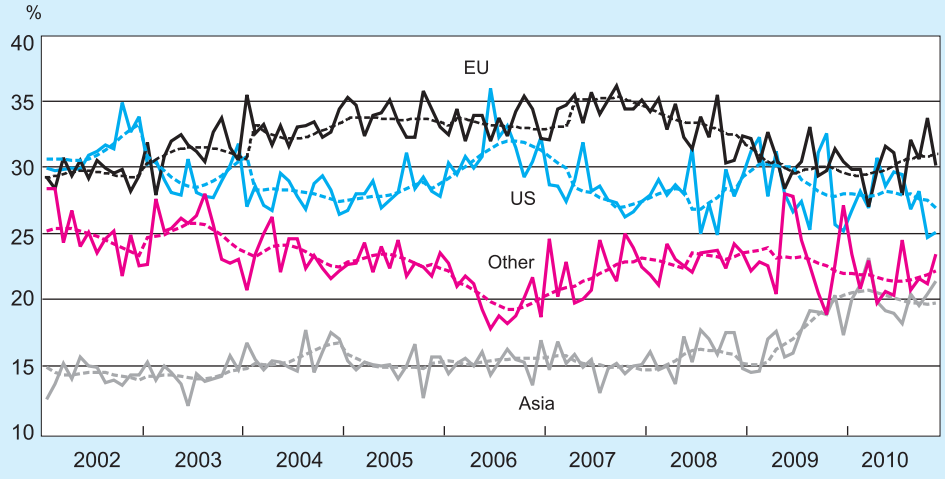
developments explain why Israeli exports recovered more rapidly than the developed markets' trade did: a rapid increase in exports of tourism and transport services and an upturn in the share of Asian markets in Israel's exports. Exports of tourism services grew by 25 percent over 2009, a year when Israeli tourism was severely affected by Operation Cast Lead and the global economic crisis, and drew very close to the record set in 2000. In several parts of the country—mainly Jerusalem and the north—hotel occupancy verged on its potential.[7] In contrast to the rapid growth of tourism-services exports, high-tech services exports actually decreased during the recovery after posting a surprising increase during the crisis. Manufacturing exports moved ahead at a pace similar to the growth of imports and the increase in the developed countries' manufacturing exports.

Two developments explain why Israeli exports recovered more rapidly than did the trade of the developed markets: a rapid increase in exports of tourism and transport services and an upturn in the share of Asian markets in Israel's exports.

In recent years, a growing share of Israeli exports has been destined to emerging markets in the East while the proportion destined to the developed Western markets has contracted. The proportional growth of Asian markets as destinations of Israeli exports in 2010 surpassed the growth of these markets' share in international trade, and the latest data on the distribution of Israeli exports by trade zones shows that the trend has gathered strength. Israel's main export destinations in recent years were the European Union (33 percent), the US (28 percent), and Asia (15 percent). In the second quarter of 2009, the share of Asia began to trend upward after many years of stability at around 15 percent (Figure 7.5) and leveled off at 20 percent in 2010. The structural change in export destinations seems to have been facilitated by the global crisis and developments in its aftermath; rapid recovery in Asia as against sluggish

The increase in the share of Asian markets as destinations of Israeli exports in 2010 surpassed the growth of these markets' share in international trade.

Figure 7.5
Composition of Israel's Exports, by Geographical Destination, 2002-10
(seasonally adjusted, trend data)



SOURCE: Central Bureau of Statistics.

[7] R. Sharabani and Y. Menashe, "Israel's Hotel Market," Discussion Paper, Bank of Israel Research Department, 2010 (in Hebrew).

Fears of another crisis in Europe cast doubt on the developed markets' ability to continue growing, prompting the above change in the distribution of Israeli exports between Europe and Asia.

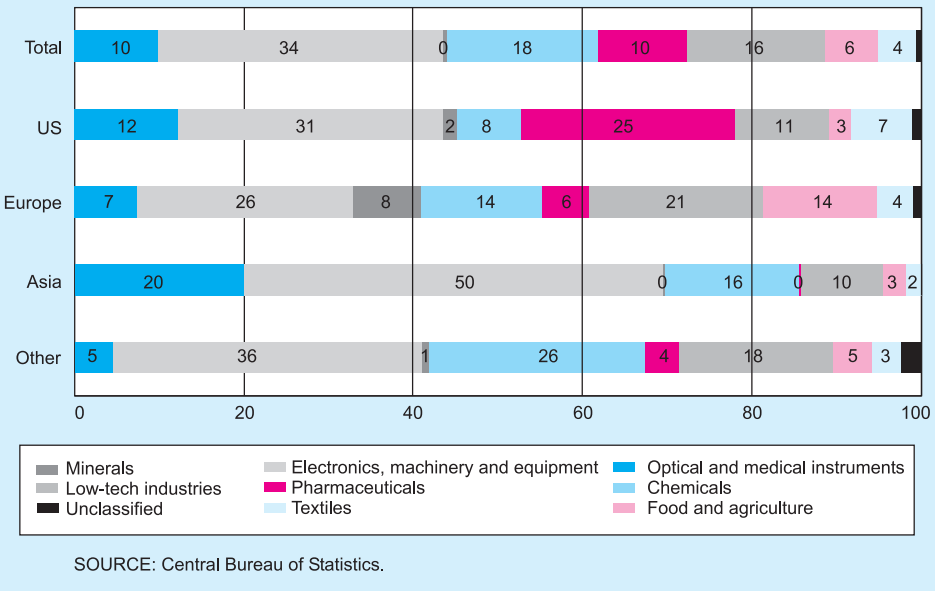
Table 7.4
Share of selected Asian countries in Israeli exports
(Share of total goods exports)

Country	2007	2010
Hong Kong	5.2	5.9
India	2.7	4.3
China	1.7	3.1
Japan	1.3	1.0
Korea	1.3	1.3
Malaysia	0.1	1.3
Other	3	3
Total	**15**	**20**

SOURCE: The Central Bureau of Statistics.

recovery of demand in the West and expectations of another crisis in Europe made the penetration of Asian markets worth pursuing. This marked a change from previous years: although demand grew more swiftly in Asia than in Europe and the US during those years, the geographic composition of Israeli exports had been developing in tandem with that of world imports. The global crisis in 2008 and fears of another crisis in Europe cast doubt on the developed markets' ability to continue growing, prompting the aforementioned change in the distribution of Israeli exports between Europe and Asia. Examination of the export destinations in Asia shows that most of the increase accrued to Hong Kong, China, India, and Malaysia, which accounted for 15 percent of total Israeli exports in 2010 (Table 7.4). If these trends gain momentum, the change in geographic composition may influence the industrial composition of Israeli trade. The industrial composition of exports to the various trade zones does not follow a standard pattern (Figure 7.6): exports to the U.S. are intensive in pharmaceuticals,

Figure 7.6
Share of manufacturing sectors in Israel's exports to primary trade regions, 2005-07



SOURCE: Central Bureau of Statistics.

those to Europe are intensive in traditional and food industries, and those to Asia are intensive in electronics. Examination of the change in the industrial composition of Israeli exports to Asia shows that the proportional increase originates in exports of electronics and chemicals.

d. Real factors that affect the real exchange rate

The increased share of Israel's exports in developed countries' trade in recent years took place against the background of real appreciation of the shekel relative to the currencies of Israel's trading partners.

The proportional increase in Israeli exports in developed countries' trade in recent years took place against the background of real appreciation of the shekel relative to trading partners' currencies: by 5 percent in 2010 and by 15 percent in cumulative terms since 2007, both in real terms. The relation between the real exchange rate and exports operates in both directions. On the one hand, real appreciation reduces the value of exports in domestic-currency terms, thereby diminishing the exporters' profits. Due to this negative relation between the real exchange rate and exports, appreciation dampens exports. On the other hand, an improvement in the productivity of tradable industries (relative to that of nontradable industries) induces an increase in exports and, concurrently, real currency appreciation due to the flow of workers from nontradable industries to tradable ones (the Balassa-Samuelson effect). This manner of thinking describes a positive relationship between the real exchange rate and exports, together, and productivity in the tradable industries because a relative increase in these industries' productivity leads both to more exports and to appreciation. Since 2007, the shekel has been undergoing real appreciation in tandem with the proportional increase in Israeli exports in the imports of Israel's trading partners. An increase in the productivity of tradable industries relative to that of nontradable ones would explain this outcome. An examination of the relative productivity of Israel's tradable industries in comparison with corresponding American industries in recent years shows that the improvement in Israel has been slightly greater—a factor that abets real appreciation. (For further detail, see box in Chapter 2.)

(1) The real exchange rate and the output gap

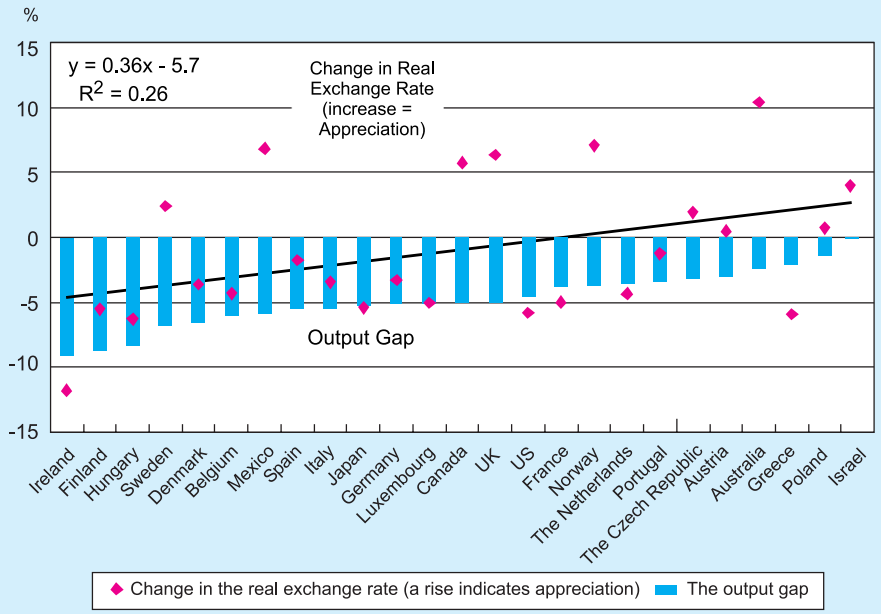
Since Israel's output gap in 2010 was 3.5 percentage points below the OECD average, the contribution of this factor to real appreciation was around 2 percent.

Another source of real-appreciation pressure is the closing of the output gap. Since demand for goods decreases at times of economic downturn and since the prices of tradable goods in Israel and abroad are the same, the relative prices of nontradable goods may fall. When the economy is doing well, in contrast, general demand for goods increases and wages and production costs rise concurrently, coupled with an increase in the relative prices of nontradable goods. Since the prices of tradable goods are determined abroad, the increase in wages and production costs makes the tradable sector less profitable and encourages labor to move from this sector to the nontradable one. Therefore, currency appreciation—an increase in the price of nontradable goods relative to that of the tradable ones—should be expected as an economy approaches its full production potential. Indeed, by examining the change in the real exchange

rate relative to the output gap in the OECD countries, we find a positive relation between them (Figure 7.7). In the estimation of the OECD, Israel is very close to its full production potential whereas its main trading partners remain in recession, resulting in real appreciation. Indeed, a long-term examination of the connection between the output gap and the real exchange rate found a statistically significant relation between these variables. Specifically, a one-percentage-point contraction of the output gap a relative to the OECD average induces about half a percentage point of real appreciation. Since Israel's output gap in 2010 was 3.5 percentage points below the OECD average, the contribution of this factor to real appreciation was around 2 percent.

Real appreciation originating in differences between output gaps may also be connected with classic thinking. The Balassa-Samuelson effect relates to real appreciation induced by a shift of factor inputs from the nontradable sector to the tradable sector as the response of the labor market to a relative increase in the productivity of the tradable sector. When the economy is at equilibrium (full employment), the increase in demand for labor in tradable industries due to the increase in these industries' relative productivity may be fulfilled by a shift of workers to these industries from the nontradable ones. In contrast, if the economy is not at equilibrium and has idle factor inputs (supply surpluses), a relative increase in tradable sectors' demand may be fulfilled by a shift of jobless persons to them. Therefore, the closer the economy

Figure 7.7
Change in Real Exchange Rate (2009 to 2010) and Output Gap (2010)



SOURCE: WEO.

is to the utilization of its full production potential, the more a relative increase in tradable industries' productivity will affect the exchange rate.

Imports

The factors underlying the increase in imports of goods were the recovery of economic activity and 5 percent real appreciation.

Imports of goods increased by 22 percent in 2010; imports of services remained at their 2009 level. The factors underlying the increase in imports of goods were the recovery of economic activity and 5 percent real appreciation, which lowered the prices of imported goods relative to domestic ones (Table 7.6), thereby inducing a considerable increase in all components of imports of goods, but at different rates: 25 percent in intermediates (not including diamonds and energy), 13 percent in consumption goods, and 10 percent in capital goods. Although imports of services remained at the previous year's level, they were less affected by the crisis than imports of services abroad.

During the crisis and the recovery, imports to Israel developed much as those to the developed markets did, even though the crisis did less harm to the Israeli economy than to the others (Table 7.7). However, the two destinations were different in their imports, largely due to differences in composition. The decrease in imports of goods during the crisis was more severe in Israel than in the developed countries, because raw materials account for a large share of Israel's imports and these imports contracted

Table 7.5
Change in the Relative Price of Goods Imports, 2001-2010

(Percent)

	2001-2002	2003-2006	2007	2008	2009	2010
Imported consumer goods prices relative to the CPI	3.0	0.9	-7.7	-8.7	1.9	-5.7
Imported non-durable goods prices relative to the CPI	1.6	1.2	-6.6	-7.5	0.0	-4.5
Imported durable goods prices relative to the CPI	4.5	0.7	-9.7	-9.9	4.6	-7.6
Imported investment goods prices relative to the GDP deflator	5.4	-1.4	-4.8	-11.3	2.1	-7.1
Imported raw materials prices (excl. fuel and diamonds) relative to the GDP deflator	3.6	3.3	-0.2	-4.3	-7.7	-2.4
Imported raw materials prices (excl. fuel and diamonds) relative to export prices	-0.3	-2.2	-4.0	-1.5	6.5	-3.3
Fuel prices relative to the GDP deflator	-0.2	21.0	3.5	24.7	-35.0	21.5

SOURCE: Based on the Central Bureau of Statistics data.

Table 7.6
Israeli and OECD imports during the crisis[a] and recovery[b]
100=2008:Q2

(Indices based on dollar figures)

	Israel			OECD		
	Share of trade[d]	Crisis	Recovery	Share of trade[d]	Crisis	Recovery
Goods imports	100%	66	88	100%	64	86
Production inputs excluding fuel	45%	67	89	18%	58	85
Consumer goods (excluding vehicles)	15%	89	104	26%	85	107
Durables	5%	94	107	12%	83	110
Current consumption	11%	87	103	14%	87	104
Capital goods (excluding vehicles, transport)	13%	70	86	23%	71	96
Vehicles	7%	71	97	10%	62	83
Fuel	20%	50	74	22%	48	66
Services imports	100%	89	90	100%	81	87
Tourism	19%	82	93	25%	81	110
Transport	32%	80	86	25%	88	94
Other business services	45%	101	92	50%	65	85

[a] From 2008:Q2 to 2009:Q2.

[b] From 2008:Q2 to 2010:Q3.

[c] OECD trade includes the US and EU 25.

[d] Two years before the crisis.

SOURCE: The Central Bureau of Statistics, OECD, Eurostat, USITC, IFS.

globally due to a sharp downturn in their prices. The rates of change in imports of raw materials to Israel and exports of goods from Israel were similar during the crisis and the recovery because a large share of imports of goods is earmarked for export manufacture. Israel's capital-goods imports did not recover as quickly as capital-goods imports to the developed markets, even though, as stated, the Israeli economy is believed to be on the verge of eliminating the output gap. A long-term examination shows that capital goods imports were far above their long-term trend on the eve of the crisis and slipped below the trend during the crisis. In the second half of 2010, capital goods imports returned to the trend line.

Israel's imports of services were less badly affected during the crisis than imports of goods, a phenomenon observed worldwide. Imports of tourism services (departures to destinations abroad) suffered less harm in Israel than abroad and surpassed the

global pace of increase once the recovery began. Imports of other business services did not react to the crisis at all, unlike the situation in the developed markets.

2. THE FINANCIAL ACCOUNT

a. Main developments

Low interest rates and quantitative easing in large developed markets instigated large capital flows from these markets to Israel, encouraged appreciation, and abetted increases in asset prices.

The most important phenomenon in the Israeli financial account in 2010 was the short term capital inflow, which strengthened the shekel. Israel's inflow was part of a set of international capital flows from large developed countries, which were mired in a grave economic crisis, to countries that proved relatively resilient to the crisis—most in the emerging-market class. Quantitative easing in the large developed countries—the US, the Eurozone, and the UK—generated enormous liquidity surpluses there, some of which flowed to other destinations in search of returns. For example, US citizens' capital outflow in debt instruments doubled in 2010.[8] The outflows induced appreciation of the destination countries' currencies, caused their share and asset prices to surge, and narrowed yield spreads (in shares and other assets) in crisis-ridden countries for assets in the countries that received the inflow, most of which were emerging markets.

Most of the capital inflow in 2010 was meant for short-term investment.

The liquidity surpluses of the developing markets flowed to Israel as well and abetted currency appreciation. Although nonresidents bought hardly any assets in Israel directly, the liquidity surpluses that they injected into the economy had a downward effect on interest rates to all terms, thereby contributing to the increase in domestic-asset prices. Thus, prices of shares and real estate in Israel increased in 2009–2010 beyond the expected rate of increase in future dividends (and rent levels); correspondingly, real yields in Israel fell and verged on the low yields generated by properties and shares abroad.[9]

Although the capital inflow continued in 2010, its composition changed: in the past, the capital inflow was to both long and short terms, whereas most foreign investment in 2010 was short-term. Long- and medium-term investments, including direct investment and portfolio investment (investments in shares and bonds net of short-term paper [*makams*]), were only $5 billion as against an annual average of $15 billion in 2006–2008. In contrast, short-term foreign investment, including (but not limited to) *makams* and deposits with Israeli banks, ramped to $15 billion in 2010 as against only $1.6 billion on annual average in 2006–2008. In fact, the net inflow of private capital to short-term investment was even greater—at $14.4 billion—since

[8] U.S. citizens' capital outflow, net of direct investments and investments in shares, was twice as large in 2010 as in the pre-crisis years (2006–2008) at $514 billion (including investments in short- and long-term bonds) in the first three quarters of the year. Bond purchases by the Bank of England and the Federal Reserve were $200 billion and $490 billion, respectively.

[9] Domestic factors—a low pre-crisis price level and insufficient housing stock relative to the number of households—also contributed to the increase in housing prices.

Table 7.7
Israel's Financial Account, 2006-10[d]
(Billion $)

	2006-2008	2009	2010
A. Israelis' investments abroad	22.0	22.0	27.0
1. Direct investments	10.4	1.7	7.8
2. In negotiable securities	4.6	8.3	9.0
3. Other investments	2.7	-4.5	-1.5
4. Foreign exchange reserves	4.2	16.8	11.8
B. Nonresidents' investmnents in Israel	17.1	10.7	17.9
1. Direct investments	11.7	4.4	5.2
2. In negotiable securities excl. *makam*	3.9	0.3	-0.2
3. Other investments and *makam*	1.6	4.8	12.9
C. Net financial flows[a]	-4.9	-11.3	-9.1
of which Net long-term capital inflow (B1+B2)-(A1+A2)[c]	0.5	-4.1	-11.8
Net short-term capital inflow (B3-A3)	-1.2	9.5	14.5
Foreign exchange reserves	-4.2	-16.8	-11.8

[a] A positive sign means net capital outflow.

[b] Net long-term capital outflow minus net direct investment and investment in negiotiable securities (excluding makam).
[c] Net short-term capital outflow minus net other investments, makam, and financial derivatives.
[d] The data for 2006-08 are annual averages, and the data for 2010 are annualized figures based on the first three quarters only.

SOURCE: Central Bureau of Statistics.

Israelis also generated capital inflow by repatriating money that they had held with foreign banks and in other short-term vehicles.

Several factors made Israel an attractive target for short-term capital inflows: its short-term interest rate rose gradually during the year and became high relative to the zero rates abroad; Israel belongs to a relatively small club of countries that allow totally unrestricted capital flows and have convertible currencies, allowing foreign investors to exploit interest spreads more easily; and most of the large short-term capital inflow was "absorbed" by increasing the foreign-currency reserves, leaving the change in the other components of the balance of payments—the current account and medium- and long-term capital flows—much milder. Foreign investment to medium and long terms did not increase in 2010, as a slight decline in foreign portfolio investment (not including *makams*) was offset by a upturn in foreign direct investment originating in larger accrued profits of foreign firms that operated in Israel (as opposed to new

investments). Thus, long- and medium-term investment was flat in 2010 despite the recovery of investment flows to emerging markets and despite the impressive performance of the Israeli economy since the beginning of the crisis.

The relatively paucity of capital flows to medium and long terms seems to have been abetted by the large short-term capital flows. As a rule, capital inflows induce appreciation, which weakens the forces that encourage continued capital inflows. This is especially the case where short-term capital flows are concerned: the influx of short-term capital, motivated by interest spreads, causes temporary and transient appreciation of the shekel until the interest spreads narrow; the temporary appreciation lowers the return on the purchase of an asset from the foreign investor's standpoint by raising the price of the asset in the present (in foreign-currency terms) without increasing dividends in the future (again, in foreign-currency terms). In this manner, it restrains the extent of the long-term foreign investment.

To mitigate the pro-appreciation effect of the capital flows, the Bank of Israel purchased $12 billion in foreign currency during the year. This intervention raises several questions: in what way is the exchange rate so different from other prices in the economy as to justify intervention? How did other countries that became favored targets of foreign investment behave? Did the Bank of Israel influence the exchange rate, and how? What costs attend to this intervention? Are additional policy measures needed? We take up these questions below in this section. In section b, we discuss factors that affected the composition of the financial account in 2010, and in section c we ask how well the Israeli economy has integrated into foreign capital markets by OECD standards and discuss the advantages and drawbacks of this integration.

(1) Is the real exchange rate overvalued?

Temporary appreciation occasioned by passing developments such as the opening of interest spreads is harmful to export competitiveness and, especially, to knowledge-intensive industries.

In 2008–2010, the real shekel exchange rate gained 15 percent over the currencies of Israel's trading partners. This powerful appreciation, against the background of capital flows to emerging markets, makes the question of its origin a more pointed one than otherwise. If the appreciation traces to a rapid increase in domestic economic productivity, it is a positive development. However, if it originates in overly optimistic expectations or transitory factors (such as especially low interest rates abroad), then it may inflict unnecessary harm on the tradable industries. This is because the exchange rate determines current resource allocation in the economy; when appreciation occurs, it reduces the profitability of exporters and manufacturers of import substitutes, causing the production of these goods to decrease. Temporary appreciation occasioned by passing developments such as the opening of interest spreads may prompt exporters to neglect export markets that offer declining profits; by the time the appreciation blows over, re-entering the market may be too expensive. Temporary appreciation may be especially dire for knowledge-intensive industries, which figure importantly in Israel, because in these industries the processes of knowledge accumulation and productivity improvement are intertwined and both of them are inextricably related to production

Fear of excessive appreciation and its effect on export competitiveness has diminished due to the stability of export market share and of the current-account surplus.

itself ("learning by doing"); thus, a temporary decrease in production activity may cause a protracted downturn in productivity.

The improvement on goods and services account in 2009 and 2010 and the maintenance of export market share suggest that the shekel is not really overvalued. The development of Israel's exchange rate relative to that of other countries (tested on the basis of panel data) also shows that the strengthening of the Israeli currency is explained in great part by the rapid increase of Israel's domestic product (relative to other countries) and by undervalued currency in the middle of the previous decade.[10] Conversely, unit labor cost is much higher in export industries than the rest of the business sector today, suggesting that profitability in these industries is low and signaling the likelihood of a future decline in exports. (See Chapter 2, Figures 7 and 11.) The stagnation in export activity in the second half of 2010[11] may also allude to difficulties in export industries' competitiveness that grow steadily as the appreciation dynamic continues. Also, the steep decrease in foreign direct investment, most of which is directed at the export industries, and the fact that the Israeli venture-capital funds raised no money abroad in 2010, may indicate concern among investors about degradation of the export industries' profitability. Fear of excessive appreciation and its effect on export competitiveness also found expression in the report of an International Monetary Fund mission that visited Israel recently, recommending that several preventive measures be considered (including intervention in the foreign-currency markets).

(2) The effect of capital flows—lessons from the past

Large capital inflows from developed markets have led in the past to economic overheating in emerging markets that sometimes ended in crisis.

Large capital flows from developed markets to emerging markets are nothing new; they occurred several times in the past, especially in the first half of the 1990s. At that time, interest rates in the large developed markets fell in response to a recession while the growth potential of the emerging markets in South America and eastern Asia seemed promising due to their successful application of reforms to reduce government deficits and inflation and enhance competitiveness. Consequently, large amounts of capital flowed into the emerging markets, causing economic activity to accelerate too aggressively: private consumption increased (mainly in South America) and investments did the same (chiefly in eastern Asia), reflected in an increase in the current-account deficit. Share and real-estate prices escalated, the money supply expanded, and South American real exchange rates appreciated steeply.[12] The excessive strength of the changes in relative prices and the growing dependency on short-term capital inflows sowed the seeds of economic crisis in Mexico (1994) and Thailand,

[10] Z. Eckstein and A. Friedman (2011). "The Equilibrium Real Exchange Rate for Israel," Working Paper, Bank of Israel Research Department.

[11] It stands to reason that the effect of currency appreciation on dampening the activity of export industries (and those that manufacture import substitutes) is gradual and protracted.

[12] G. A. Calvo, L. Leiderman, and C.M. Reinhart (1996). "Inflows of Capital to Developing Countries in the 1990s," The Journal of Economic Perspectives, 10:2, pp. 123–139.

South Korea, and other East Asian countries (1997). An IMF study[13] that identified and examined 109 episodes of capital inflow in 1987–2007 found that such flows had an especially adverse effect on countries that had large current-account deficits and had exploited the boom years to increase government spending—phenomena that hardly exist in Israel's current episode of capital inflow. The negative impact of the capital inflow in these countries was mirrored in a rapid but temporary acceleration of economic activity followed by a steep downturn in product: one-third of the episodes (thirty-four cases) ended with the sudden cessation of the capital inflow and 15 percent (thirteen cases) ended with currency crises and steep depreciation (20 percent of the episodes studied have not yet ended).

An important lesson to learn from past bouts of capital inflow is that market forces alone will not necessarily align a country's exchange rate with its levels of productivity and competitiveness, as evidenced by the severe exchange-rate fluctuations that typify these episodes. The episodes also show that short-term capital inflows should not be encouraged because they increase the probability of a reversal of capital flows and its attendant damage (unlike direct investment, which proved resilience to the crisis). Since most accepted measures that aim to prevent the adverse effects of capital inflow, including rate-hiking and purchases of foreign currency, actually tend to increase the short-term capital inflow, they should be accompanied by complementary measures that diminish investors' profits from short-term capital inflows. The historical episodes do not elicit an unequivocal conclusion about the effectiveness of central-bank measures at times of capital inflows; the IMF study found that the central bank's anti-appreciation measures—amassing foreign-currency reserves and restricting capital flows—generally made only a small contribution to the stanching of excessive appreciation. These measures did, however, have a favorable effect on the composition of the flows: the share of short-term flows declined and that of long-term flows increased. Other studies found that the use of a range of tools to stem capital inflows, including restrictions, foreign-currency purchases, and fiscal tightening, helped to enhance economic stability. (For an example, see Calvo et al., 1996.[14])

An important lesson to learn from past bouts of capital inflow is that market forces alone will not necessarily align a country's exchange rate with its levels of productivity and competitiveness.

(3) The effect of the Bank of Israel's foreign-currency purchases on the exchange rate

The Bank of Israel's foreign-currency purchases have a pro-depreciation effect, one that is, however, definitely mitigated by the unrestricted capital inflows and outflows and the enormous liquidity surpluses abroad. In essence, the Bank of Israel is increasing the supply of shekel assets in private investors' portfolios, thereby increasing their exposure to exchange-rate volatility. Investors, especially foreign ones, prefer to diversify their investments across different countries and currencies; the steadily growing share of the shekel in their portfolios increases their portfolio

The Bank of Israel's purchases of foreign currency have a pro-depreciation effect because they place more shekels in foreign investors' hands and expose these investors to exchange-rate-volatility risk.

[13] For a broader look, see R. Cardarelli, "Capital Inflows: Macroeconomic Implications and Policy Responses," IMF Working Paper WP/09/40.

[14] See reference in note 12.

risk and prompts them to demand a larger and larger risk premium in return for it—causing the shekel to appreciate against other currencies. The Bank of Israel's pro-depreciation action is effective because foreign investors are not indifferent to the risk originating in the growing exposure of their portfolio to the Israeli currency (even if the shekel itself does not become riskier or more volatile).

Nonresident investors can protect themselves against the exchange-rate risk by buying hedging options against shekel depreciation. Indeed, both the price of these options and the extent of activity in them increased in the second half of 2010.

Nonresident investors can protect themselves against the exchange-rate risk by buying hedging (call) options against shekel depreciation. Therefore, the price of these options may shed some light on the price that nonresidents are willing to pay to neutralize the risk originating in the greater exposure of their portfolios to the Israeli currency (the shadow price). Capital-market data showed that both the price of these options and the extent of activity in them increased in the second half of 2010 relative to options that hedged against appreciation,[15] although the narrowness of the spread that opened between them suggested that the investors' fear of depreciation was not acute. Nonresident investors also went outside the capital market to acquire options that hedge against depreciation, as data from institutional investors indicate. In 2009–2010, these entities executed hedging contracts against currency depreciation on a very large scale ($1.5 billion) but nonresident holdings of *makams* were much greater ($9.2 billion). Notably, institutional entities execute hedging contracts because depreciation hardly hurts them at all since it increases their profits on foreign assets. (The levels of institutional holdings in shares and bonds in foreign markets greatly exceed those expressed in the hedging agreements.) This aside, fund members examine their yields in terms of purchasing power in Israel, not that abroad.

To gauge the effect of the Bank of Israel's foreign-currency purchases on the exchange rate in 2010, an examination was performed on the basis of an accepted economic model (the Uncovered Interest Rate Parity model) that traces exchange-rate changes to surprises in the Bank of Israel interest rate.[16] The inquiry found that the response of the exchange rate in 2010 resembled its past response in terms of sensitivity[17] and even exceeded it. This challenges the hypothesis that foreign-currency purchases attenuate the immediate effect of an interest increase on the exchange rate, because under a regime of intermittent intervention in the foreign-currency market, the market expects the central bank to respond to appreciation and weaken it by buying foreign currency.[18] The examination showed that the sensitivity of the exchange rate to interest changes did not diminish: the foreign-currency purchases that followed the interest rate increases did not attenuate the excess effect of the interest rate increase on the exchange rate; the effect rose steadily one week and two weeks after the interest

[15] The absolute prices of both kinds of options decreased during 2010, returning to levels that were prevalent before the global financial crisis began.

[16] The surprises–unexpected changes in the interest rate–were measured as the difference between the actual change in interest rate and the change that analysts had predicted eight to twelve days previously.

[17] In 2000–2007, the Bank of Israel refrained from intervening in the foreign-currency market.

[18] Indeed, in 2007 a correlation was found between interest-rate increases and foreign-currency purchases: after rate hikes of 25 basis points in January, April, August, and October, nonresident demand for NIS assets increased and the NIS appreciated. With one exception (in August), the Bank of Israel responded with especially large purchases of foreign currency, in excess of $1 billion.

rate increase was announced. These results make it seem that the foreign-currency purchases did not offset the effects of the (unforeseen) rate increase on the exchange rate. They may, however, originate in the large liquidity surpluses abroad: the liquidity surpluses made the exchange rate more sensitive to interest than in the past, and therefore the attenuating effect of the foreign-currency purchases on the exchange rate did operate but remained covert.

The Bank of Israel's foreign-currency reserves provide the economy with liquidity that may be valuable at a time of crisis. However, the economy pays a price for the holding of the reserves.

The Bank of Israel's foreign-currency reserves provide the economy with liquidity that may be valuable at a time of crisis and may even make the development of a crisis less likely. However, the economy pays a price for the holding of the reserves because the reserves are invested in liquid and safe assets abroad, which generally deliver a lower return than would be obtained on safe long-term assets (and lower than the return that the Bank of Israel pays foreign investors who hold *makams*). The exact cost of holding the reserves is determined only in the future because it depends on the future value of the currencies that the Bank of Israel holds. If the real purchasing power of these currencies declines, the cost to the economy rises; if it holds steady, the only cost is the liquidity premium. Notably, the marginal cost of an increase of the foreign-currency reserves is smaller than the average cost because the larger the reserves are, the more the Bank can reduce the share of liquid assets in its portfolio in order to improve the return. Furthermore, the step taken by the Ministry of Finance to hedge Israel's dollar-denominated debt, which is valued at roughly $30 billion, has a pro-depreciation effect but does not involve a cost inflicted by holding very liquid and very safe assets abroad (although the hedging action itself comes at a cost).

(4) Additional policy measures

Given the increase in domestic inflation pressures and continued quantitative easing in the West, restrictions on capital inflows may be a more stable way to stanch capital inflows.

In early 2011, the Bank of Israel took measures to limit capital inflows and reduce nonresidents' profits from short-term capital inflows: it forced the banks to maintain 10 percent liquidity on nonresident transactions in foreign-currency derivatives[19] and the Ministry of Finance announced its intention of doing away with the exemption from capital gains tax on nonresident *makam* earnings. Thus, Israel joined other countries that had become favored targets of capital inflows and were taking measures to stanch them, although in these countries (Brazil, South Korea, and Thailand) the measures were much stronger. Although the steps invoked in Israel marked a slight retreat from the total liberalization of the foreign-currency market, they were justified because the capital inflow had caused over-appreciation of the currency and raised asset prices, and because a further buildup of foreign-currency reserves—which were rather high to begin with—comes at a fiscal cost. The restrictions on capital inflows may provide a more stable path to the attenuation of the inflow in view of the upturn in domestic inflation pressures (against the background of a labor market on the verge of full employment) and repeated postponements of the termination of quantitative easing in Western countries. If the restrictions imposed proved to be effective, they will make the inflation target attainable and assure financial stability without excessive harm to

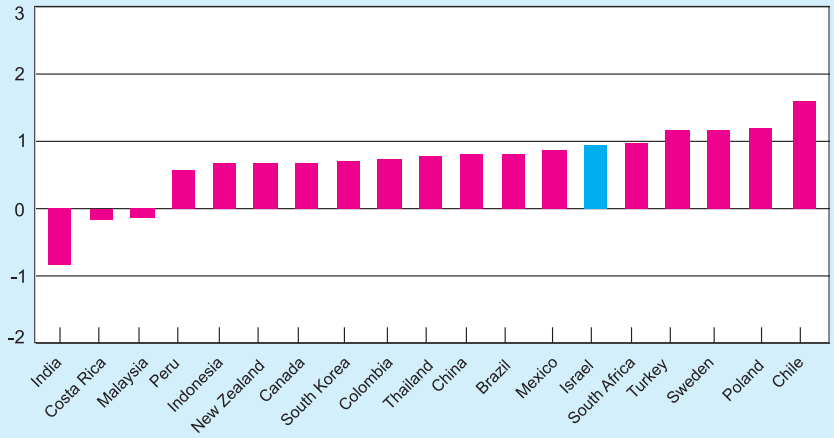
[19] The Bank of Israel announced this measure on January 20, 2011.

Box 7.1
The Capital Inflow "Resistance Index"—International Comparison

The Bank of Israel did not offer exceptional "resistance" to capital inflows in 2010 by the standards of other countries that had been attracting such inflows, as evidenced in an index developed by the IMF. One may use the index to calculate the extent of "resistance" to capital inflows on the basis of the (relative) degree of central-bank policy in the foreign-currency market. A country that experiences currency appreciation without changing the level of its foreign-currency reserves is regarded as having zero resistance to capital inflows; an economy with a fixed exchange rate and steadily growing foreign-currency reserves (relative to the monetary base) is considered strongly resistant to capital inflows. Practically speaking, the index examines the extent of foreign-currency purchases by the central bank relative to the strength of the country's capital inflows, measured as the weighted average of the increase in the reserves (relative to the monetary base) and the currency appreciation.[1]

The comparison described here relates to the period between July 2009 and June 2010 and includes emerging markets that had become favored targets of capital inflows—Brazil, Turkey, New Zealand, Chile, South Korea, Thailand,

Figure 1
The Resistance Index,[a] July 2009 to June 2010



[a] The index is based on a working paper published by the IMF: R. Cardarelli, S. Elekdag and A.M. Kose (2011), "Capital Inflows: Macroeconomic Implications and Policy Responses."
SOURCE: Based on IFS data.

[1] The weight assigned to each component (the increase in the foreign-currency reserves relative to the monetary base, and the exchange-rate change) is inversely proportional to its standard deviation. For a broader discussion, see R. Cardarelli. "Capital Inflows: Macroeconomic Implications and Policy Responses," IMF Working Paper WP/09/40.

etc. Notably, some countries that had not been targeted for capital inflows were filtered out of the first group of countries chosen: five East European countries because their currencies had depreciated while their foreign-currency reserves contracted, and Hungary and Argentina, which experienced steep depreciation. Norway and Australia were not included due to data constraints.

The results single out Chile, Poland, Sweden, and Turkey as especially "resistant" countries, in which the central banks purchased foreign currency until their exchange rates reversed direction (to depreciation), and South Africa, where the currency did not appreciate at all. Israel's "resistance" to capital inflows was stronger than that of Mexico, Brazil, China, Thailand, South Korea, New Zealand, Indonesia, and Peru; in all these countries, however, the reserves increased considerably (relative to the monetary base)—by 20 percent or more. It should be recalled that in most of these countries, capital inflows were also resisted by means of restrictions on them—a factor not reflected in the index. Malaysia, Costa Rica, and India showed no "resistance" to capital inflows; their foreign-currency reserves contracted despite the appreciation of their currencies.

the competitiveness of exports.

b. Components of the financial account

Pursuant to the global crisis, direct investment fell more steeply in Israel than abroad.

This part of the chapter discusses main developments in the components of the financial account—direct investment, portfolio investment, and other investment. (For details, see Table 7.6.)

Foreign direct investment: net foreign direct investment—total new investments less realization of existing investments—increased in 2010. In 2009, in view of the global crisis, global foreign direct investment plummeted by 37 percent and that in Israel fell even more steeply, by 60 percent. In 2010, global foreign direct investment increased by 10 percent[20] whereas that in Israel advanced by 16 percent. Consequently, direct investment declined more steeply in Israel than abroad pursuant to the global crisis, despite the domestic economy's resilience to the crisis. In the previous business cycle, too, direct investment fell more steeply in Israel than worldwide, but this happened because the global crisis had focused on high-tech industries, which are especially important in the Israeli economy, and was accompanied by an acute domestic shock, the second intifada.

[20] Reported by UNCTAD (United Nations Conference on Trade and Development) and based on direct-investment data for the first half of 2010.

Past data indicate that the correlation between change in foreign direct investment and change in physical investment in Israel is not large; most of it originates in the effect of business cycles on both types of investments, as opposed to a causal relation.

Direct investment increased in 2010 but remained far below its pre-crisis level. Foreign direct investment is highly volatile, affected by individual transactions and the profitability of foreign firms that operate in Israel. In 2009–2010, two large realizations of foreign direct investments stood out, at $1.5 billion each: a foreign firm sold an Israeli company 51 percent of its equity in Partner in 2009, and a foreign investment company sold 30 percent of Bezeq equity to an Israeli company in 2010. In 2010, direct investment originating in undistributed accrued earnings of foreign firms operating in Israel increased powerfully (by $1.3 billion) and direct investment excluding accrued earnings declined.

Developments in direct investment have only a mild effect on domestic physical capital stock. Physical investment in nonresidential industries increased in 2010 despite a relatively minor upturn in foreign direct investment. Past data indicate that the correlation between change in foreign direct investment and change in physical investment in Israel is not large; most of it originates in the effect of business cycles on both types of investments, as opposed to a causal relation. One of the reasons for the weak connection between the two is that both components of direct investment that relate more closely to physical investment have been relatively stable: according to UN data, most of the global decrease in direct investment in the recent crisis originated in a decline in mergers and acquisitions. In contrast, firms' investments of accrued earnings and in new ventures, which contributed directly to increasing physical capital stock, proved resilient to the crisis; the number of new investment ventures worldwide—"greenfield projects"—declined by only 15 percent in 2009. Much the same happened in Israel: the decrease in investments of accrued earnings and in new ventures was relatively moderate; their share in total direct investment increased from 46 percent in 2006–2008 to 70 percent in 2009–2010. Importantly, most foreign direct investment in Israel in recent years has been made in high-tech industries (Table 8).

The deletion of Israel from the index of emerging markets in May 2010 triggered large realizations by foreign investment funds that invest in emerging markets; most of this effect, however, was offset by other foreign investors before the month was out.

Foreign portfolio investment (excluding *makam*): foreign portfolio investments in shares (net, excluding *makam*) slumped from $3.8 billion in 2006 and 2007 to an annual average of only $0.6 billion in 2009 and 2010 (an 84 percent decrease). Corresponding investments by US citizens in foreign shares declined by 50 percent during this time.[21] Net foreign portfolio investment was especially paltry in 2010 and total realizations actually slightly surpassed total acquisitions of shares (by $0.2 billion).

The reclassification of Israel by MSCI as a developed market and its deletion from the index of emerging markets triggered a large and sharp technical realization of foreign investment funds' holdings on the Tel Aviv Stock Exchange—from a level of $6.5 billion to $3.5 billion. Most of this realization ($2.6 billion) took place in May, the month when Israel's reclassification occurred, and the impact was clearly reflected

[21] Net foreign share investments by U.S. residents (excluding direct investment) came to $140 billion in 2006 and 2007, slipped into negative territory in 2008, and rebounded to $60–70 billion in 2009 and the first half of 2010.

Table 7.8
Nonresidents' Direct Investment in Israel, by technological intensity, 2007-2010
(percent)

	2007	2008	2009	2010
A. Industry				
High-tech industries	24	1	25	27
Other industries	11	7	5	6
B. Other sectors				
High-tech services	37	31	33	5
Commerce and other services	21	22	26	38
Real estate	20	13	22	21
C. Owners' loans and unclassified	-13	26	-11	2
D. Total direct investment	100	100	100	100

SOURCE: Bank of Israel.

in an unprecedented volume of activity on one trading day that month.[22] The effect of the reclassification traces to the relatively large size of the funds that specialize in emerging markets. These funds are accepted vehicles for investment in emerging markets, whereas many other channels are used for investment in developed markets. Furthermore, Israel's share in the indices that it joined is so small that some funds may have chosen not to invest in the country.[23] Importantly, the reclassification had no significant effect on capital flows (and on share prices): most of its impact was offset before the month was out as other (non-institutional) foreign investors acquired shares at a very substantial amount of $2 billion. Consequently, foreign holdings in shares traded on the Tel Aviv Stock Exchange rebounded in subsequent months.

Israelis' direct investments abroad posted an impressive recovery in 2010, returning to their pre-crisis level after slumping to 76 percent of that level in 2009. The main reason was one very large transaction in the third quarter, in which the Israeli firm Teva acquired the German company Ratiopharm, boosting Israelis' direct investment abroad by $3 billion. Even without this aberrant transaction, however, Israelis' direct investment abroad increased appreciably, from $0.8 billion in the first half of 2009 to $2.2 billion in the year-later period—still low by pre-crisis standards.[24] Some 80 percent of Israelis' direct investments in recent years have been made in Europe, chiefly the eastern part of the continent, where direct investment recovered in 2010 after plummeting during the global crisis.

Israelis' direct investments abroad recovered impressively in 2010 after having slumped in 2009.

[22] Seventy percent of foreign funds' holdings are in five shares only—Teva, Checkpoint, Israel Chemicals, Bank Leumi, and Bank Hapoalim. These five equities experienced an extraordinary volume of activity on one trading day in late May. The first three shares stir much interest among foreign investors and are regularly covered by international entities.

[23] Israel's share in the MSCI World Index is only 0.4 percent.

[24] Except for the first quarter of 2006, when there was another mammoth transaction involving Teva, average quarterly investment in 2006–2008 was $1.8 billion.

The share of institutional players in investment abroad has been climbing steadily—from 10.6 percent at the end of 2009 to 12.9 percent in January 2011.

Israelis' portfolio investments abroad were $9 billion, most ($7.3 billion) in shares and the rest in bonds, which have been delivering relatively low yields in global markets since the onset of the global crisis. One-fourth of Israel residents' investments in foreign shares in 2010 was initiated directly by households (including via mutual funds), which resumed investing abroad in the second quarter of 2009. Since then, investments abroad have been growing steadily (by 40 percent in 2010). Most Israeli investment in shares (63 percent) in 2010, as in past years, originated in the activities of institutional investors, which are building up their foreign investments abroad and diversifying their risks on the basis of a long-term strategy. The share of institutional players in foreign investment has been climbing steadily—from 10.6 percent at the end of 2009 to 12.9 percent in January 2011.[25] This process is expected to continue as the proportion of assets in new pension funds increases and that in the old funds declines, since new funds invested 18.3 percent of assets abroad in 2010 and old funds invested only 6 percent in this manner. Although the pension funds increased their external investments in 2009–2010, their exposure to exchange-rate risk did not increase because they hedged against it. Since funds' investments abroad are a capital outflow and hedging actions are a capital inflow, the net effect of the pension funds' activity on capital flows and the exchange rate is probably small.

Other net investments by Israelis and nonresidents added up to a net capital inflow of $5.2 billion, reflecting the wish of foreign and domestic investors to take advantage of Israel's higher interest rates. The most conspicuous factor in this category of investments was the upturn in bank-deposit activity: foreign banks' and nonresidents' deposits with Israeli banks and the withdrawal of Israeli investors' deposits with foreign banks came to $5.6 billion together. Due to similar considerations relating to interest spreads, foreign investors acquires $9.2 billion in shekel interest-bearing short-term securities (a flow recorded as a portfolio investment and not part of the "other investments" category). The total capital inflow prompted by short-term considerations—net other investments and nonresident investments in *makams*—was $14.4 billion.

The total capital inflow prompted by short-term considerations—nonresident investments in *makams* and other investments (net)—was $14.4 billion.

The foreign-currency reserves—the Bank of Israel purchased $11.8 billion in 2010 to attenuate the forces that were encouraging pro-appreciation capital inflows.

c. Israel's International Investment Position—international comparison

Israel's International Investment Position (IIP)—its balance of assets and liabilities—measures the stock of foreign investment in Israel (the economy's total liabilities with the rest of the world) against Israelis' investment stock abroad (the economy's total

[25] The institutional entities are pension funds, provident and advanced-training funds, and insurance companies, excluding mutual funds. The increase in foreign investment was accompanied by the hedging of exchange-rate risk, a procedure that may mitigate the effect of the investments on the NIS exchange rate.

foreign assets). This reckoning is something like the summation of all investment flows on financial account in previous years, expressed in present value. A country's inventory of assets and liabilities abroad is an accepted indicator of the extent of its integration into the global capital markets. Below we compare Israel's IIP with that of other OECD countries in order to determine how well the Israeli capital market has integrated itself into foreign markets and is open to them.

The integration of Israel's economy into the global capital markets, measured in terms of Israelis' inventory of investments abroad and that of nonresidents in Israel, is low by the standards of developed countries.

The total IIP—total Israeli investment abroad and foreign investment in Israel, expressed in absolute percent of GDP—is far below the developed countries' median (231 percent of GDP as against 363 percent) and resembles the emerging-market median (245 percent). This would suggest poor integration of foreign investors into the Israeli economy and of Israeli investors into foreign capital markets by the standards of developed markets (those belonging to the OECD). Furthermore, the gap between Israel and the developed markets has not narrowed in the past decade. Although Israel's indicator did rise by 45 percent between 2000 and 2009 (from 160 percent of GDP to 231 percent), that of most developed markets made even greater progress: seventeen countries posted larger increases than Israel's and only nine lost relative ground. (Data for five developed countries were lacking.) The median index increase among developed markets was 61 percent as against 45 percent in Israel, as stated.

The extent of integration of foreign investors into the economy and of domestic investors into global capital markets rises in tandem with the economy's level of development. Table 7.9 and Figure 7.8, which standardize the integration levels of Israel and the other OECD countries to per-capita GDP, show that Israel's level of integration is 40 percent below the OECD average. However, Figure 7.8 indicates that there is much variance in this indicator and that Israel is probably not very unusual by developed markets' standards. The international comparison of the components of investment shows an especially severe deficiency in Israelis' portfolio investments abroad, which are 40 percent under the developed countries' norm. The difference between Israelis' actual direct investments abroad and the level of this indicator in the developed countries (with differences in per-capita GDP taken into account) is 22 percent. In contrast, Israel's foreign-currency reserves, which are invested abroad, are relatively large, as warranted by Israel's higher level of geopolitical risk.

The advantages of financial integration into foreign economies are disputed. The theory says that such integration helps to enhance macroeconomic stability, since the global dispersion of the portfolio reduces exposure to country-specific shocks and eases volatility in private consumption. Empirical studies, however, have not found real evidence of a decrease in the volatility of private consumption due to integration. They also find it hard to demonstrate unequivocally that financial liberalization contributes to growth; most studies indicate that this contribution depends on specific conditions: high-quality governing institutions, a stable financial system, openness to foreign trade, and a responsible macroeconomic policy. In the opinion of some scholars, the findings demonstrate the contribution of the conditional variables

Table 7.9
Israel's Actual International Investment Position in 2009, and the Forecast Value[a] Based on the Level in OECD[b] Countries

(percent of GDP)

	Israel, actual value	Israel, forecast value [a]	Countries excluded from sample[a]
Total assets and liabilities	231	390	Ireland
Assets, net	-3	-40	Iceland
Assets abroad	114	170	Iceland, Ireland
Direct investment	29	40	
Investments in negotiable securities	27	52	Ireland
Other investments	27	64	
Reserve assets	31	12	
Liabilities abroad	117	219	Ireland
Direct investments	37	55	
Investments in negotiable securities	49	74	Ireland
Other investments	32	66	Iceland, Ireland

[a] The forecast value is an estimate based on regressions estimating the correlation between the share of assets and liabilities in GDP and per capita GDP in the developed economies; see figure below.
[b] Australia was excluded because of lack of data, and Luxembourg because of extreme values. Iceland and Ireland were excluded because of extreme values.

SOURCE: Moodys, BOP.

It is almost certain that better financial integration with foreign markets is good for growth, although empirical studies in various countries have not found unequivocal evidence of this.

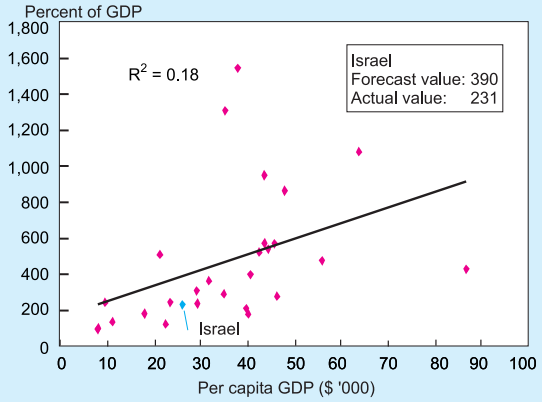
(institutional quality, responsible policy, etc.) but fail to prove that liberalization itself contributes to growth.[26] Proponents of liberalization believe that it does contribute economic growth but mainly indirectly, by incentivizing policymakers to adopt a more responsible policy and improve the quality of governing institutions in order to avert shocks among foreign investors.[27] Opponents, in contrast, claim that liberalization may equally incentivize an irresponsible economic policy by allowing cheap financing of the government deficit.[28]

Research into the components of investment and their contribution to growth have found, surprisingly, that foreign portfolio investments in shares made a significant contribution to growth while direct investment contributed only in some cases and only under certain conditions. Yosha (2003)[29] treats the profusion of Israeli corporate issues in the US (mainly in NASDAQ) as an eminent example of the advantages of financial

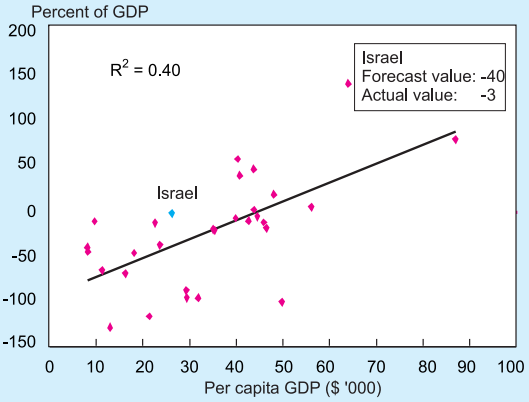
[26] D. Rodrik and A. Subramanian (2009). "Why did Financial Globalization Disappoint?" IMF Staff Paper 59, pp. 112–138.
[27] M.A. Kose et al. (2009). "Financial Globalization: A Reappraisal," IMF Staff Paper 56, pp. 8–52.
[28] Such a policy is one that facilitates an increase in the current-account deficit and the government deficit chiefly at times of upturn in foreign investors' risk appetite.
[29] S. Kalemli-Ozcan, B.E. Sorensen, and O. Yosha (2003). "Risk Sharing and Industrial Specialization: Regional and International Evidence," American Economic Review, 93:3, pp. 903–918.

Figure 7.8
Assets and Liabilities as a Share of GDP, and Per Capita GDP in the OECD Countries, 2009

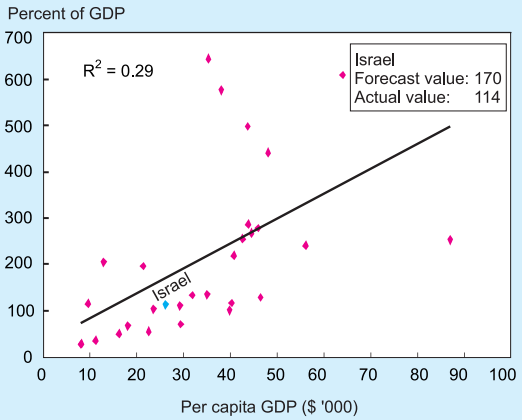
a. Total assets and liabilities as a share of GDP



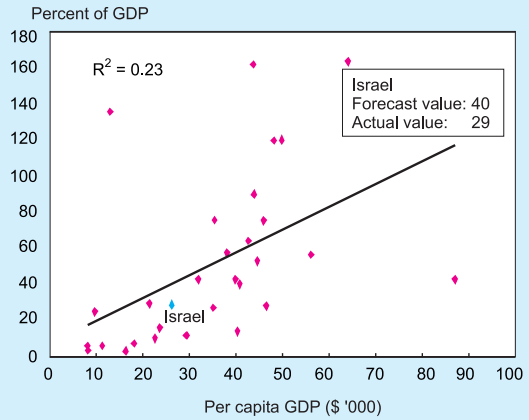
b. Share of total net assets in GDP



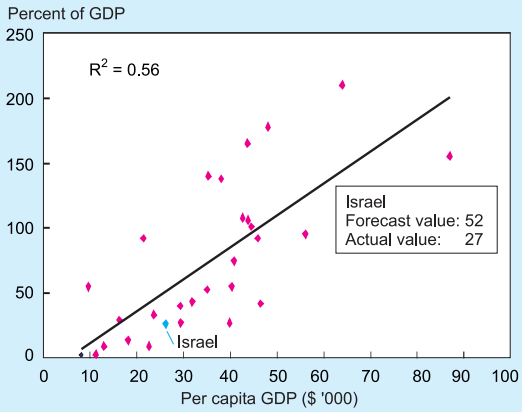
c. Total assets as a share of GDP



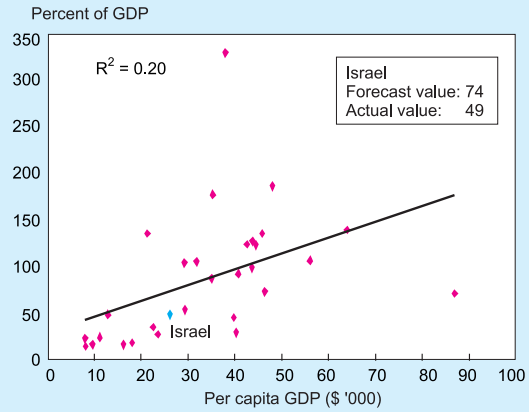
d. Direct investment abroad as share of GDP



e. Investment in the tradable securities portfolio abroad as a share of GDP



f. Nonresidents' investment in the tradable securities portfolio in Israel as a share of GDP



* Excluding Australia, Ireland and Luxembourg.
SOURCE: Moodys, BOP

liberalization: foreign investors, undeterred by the acute risk of investing in high-tech shares, allowed the economy to develop and strengthen its comparative advantage in this field. Studies show that nonresidents' other investments—in debt instruments (i.e., loans to residents), especially short-term—have a negative effect on growth. A negative effect was also found in the recent economic crisis: countries that had large external liabilities in debt instruments were harder hit by the crisis than others were. Our international comparison shows that foreign direct and portfolio investment in Israel (both in percent of GDP) are both low by the standards of developed countries that resemble Israel in per-capita product; one-third lower than what would be expected (Table 7.9), whereas the other investments are 50 percent lower.

Research has found that foreign portfolio investment contributes to growth, that foreign direct investment contributes only in some cases and only under certain conditions, and that other foreign investment is injurious to growth.

An international comparison of the net IIP—total stock assets abroad less total stock of liabilities abroad—shows that Israel's deficit (3 percent of GDP) is much better than that of other developed countries that resemble it in per-capita GDP; these countries have a negative IIP of 40 percent of GDP (Figure 7.8). By implication, Israel's future capital-income account (part of the current account) should be better than that of other developed markets that resemble it in per-capita GDP.

Israel's international investment position in 2010

Israel's IIP improved in 2010: its net liabilities surplus—liabilities less assets—decreased from $6.5 billion to $3.3 billion. The main reason for the improvement was a $6.7 billion surplus on current account, a surplus that directly reduced the economy's external net liabilities. Conversely, revaluation of the IIP had an upward effect on the liabilities surplus because nonresident investments in Israel appreciated more than Israelis' investments abroad did, chiefly due to shekel appreciation against the dollar and the euro and increase in prices of assets in Israel relative to those abroad. Another factor behind the moderate scale of the increase in the value of Israeli assets abroad was the preponderance of conservative assets in the investment; such assets do not gain much in value at times of capital-market recovery.

Israel's IIP improved in 2010 due to its large surplus on current account.

Box 7.2. Will the Israeli economy become infected with the "Dutch Disease"? The natural gas discoveries and their effects on the current account and the real exchange rate

- In recent years domestic natural gas is replacing imported fossil fuels at a scale of 1 to 2 billion dollars a year. The gas fields that have been discovered in the past two years are expected to double the scale of replacement after 2015.
- An improvement of around one billion dollars in the current account as a result of the production of gas in Israel leads to an appreciation of only around one percent in the real equilibrium exchange rate.
- The negative impact on the real exchange rate is large enough to affect the tradable sector adversely—an effect known as the Dutch Disease––only if an industry of exporting natural gas develops, and additional fields are discovered.
- One of the ways of mitigating the effects of the Dutch disease is to establish a Sovereign Wealth Fund that will invest abroad the government income from gas production.

Until 2000 Israel did not possess a large volume of domestic energy sources. Except for a brief period in the 1970s during which significant quantities of crude oil were produced from the oilfields in Sinai, almost all the energy materials required for the economy were imported. This placed a heavy burden on the economy, particularly in the years of high energy prices.[1]

This situation has changed in the past decade. Since 2004 domestic natural gas is being produced from the "Yam Tethys" field off coastal Ashkelon and is being used to produce electricity. In the past two years two large natural-gas reservoirs have been discovered in deep water off Israel's northern coast: "Tamar" and "Leviathan". These discoveries significantly change the energy-economy picture by providing enough natural gas to meet Israel's needs well into the future, and possibly even for export.

In recent years the domestic natural gas has allowed the economy to reduce imports of energy materials, and this process is expected to gain momentum. These developments will lead to a growth in the surplus in the current account and to appreciation in the real exchange rate, and in this respect they are liable to affect the exports of the other industrial sectors adversely, the phenomenon

[1] In the early 1980s, during the second fuel crisis, 9 percent of GDP was spent on energy imports. The proportion fell to 3 percent of GDP in the early 2000s but rebounded to 6.5 percent in 2008, a year of peak energy prices.

known as the Dutch Disease.[2] An empirical assessment undertaken by the Bank of Israel has quantitatively estimated the possible impact of the discovery of natural gas on the economy, including examining the extent to which the economy will be affected by the Dutch Disease.

To estimate the direct quantitative effect of the recent discoveries on the future current account, one may use production from the Yam Tethys field as a test case. The share of electricity produced by means of this gas rose steadily to 32 percent in 2009.[3] The Yam Tethys gas reduced the economy's need for imported coal and heavy fuel oil: between 2004 and 2009, the use of coal for electricity production did not increase and the use of heavy fuel oil fell to nearly zero, even as total electricity production increased by 20 percent. To calculate the savings on the energy sources that were replaced, one must make an assumption about how the Israeli Electric Corp. (IEC) would have structured its electricity production had it not used gas for this purpose; therefore, an exact estimate is not possible. Had IEC used coal to produce the electricity that it produced by gas in 2010, it would have had to increase its imports of coal by 50 percent, i.e., an increase of nearly USD 1 billion in imports. Had the electricity been produced by means of heavy fuel oil or diesel fuel, imports would have increased by $2 billion.[4]

The substitution of natural gas for alternative fossil fuels is expected to continue. In addition to continued substitution by IEC for the production of electricity, energy-intensive industries that run their own power stations today are expected to use natural gas as a direct source of energy. By conservative estimate, another $2 billion or so will be saved in energy imports by mid-decade.

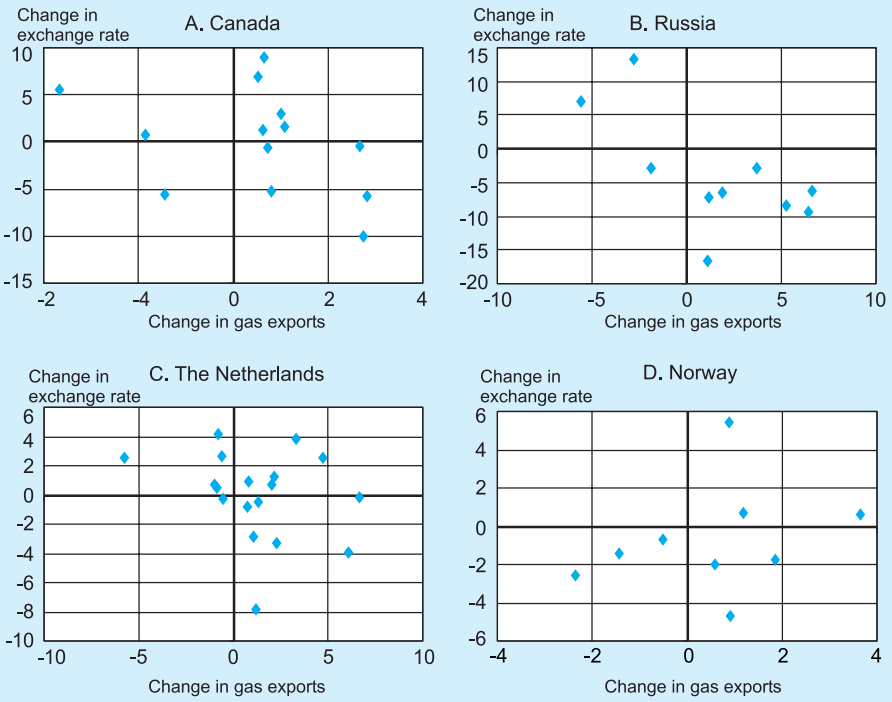
The impact of the gas discoveries, however, does not end there. The Leviathan field leaves open the possibility of exports; in such a case, the effect on the current account may be much greater. However, the development of an infrastructure for the export of natural gas is very expensive and time-consuming. Consequently, even if this possibility becomes a reality, it will happen only toward the end of the decade.

[2] This expression originates in the steep appreciation of the Dutch guilder in the 1960s, when natural gas reserves were discovered in the North Sea. In a updated general survey of the theory and the empirical findings in this matter, including the many factors that bring on the "Dutch disease"—such as the discovery of natural resources or a change in their price, foreign aid, transfer of payments on account of labor, and interest spreads, see N. Magud and S. Sosa (2010), "When and Why Worry About Real Exchange Rate Appreciation?" International Monetary Fund, WP/10/271.

[3] Egyptian gas is also used to produce electricity. Gas imports from Egypt in 2009 were worth USD 205 million.

[4] The calculation is based on IEC's 2009 statements and disregards the increase in electricity production in 2010.

Figure 1
The Change in Natural Gas Exports as a Percentage of Trade, and the Percentage Change in the Real Exchange Rate, Selected Countries
(Each observation represents a year. A rise in the exchange rate means depreciation.)



In order to examine directly the present and future impact of domestic gas production on the exchange rate, we examined the impact of an increase in the export of raw materials, particularly natural gas, on the real exchange rate in several countries that export natural gas. Few countries export gas on a large scale; the leaders in this respect are Russia (180 bcm in 2008), Canada (100 bcm), and Norway (80 bcm per year). Their gas exports exceed Israel's potential by far unless additional reserves are discovered here. Just the same, since the Israeli economy is smaller than those being compared, the share of potential gas exports in total Israeli exports resembles that of the large gas exporters.

Although the effect of exporting natural resources on real exchange rates is extensively discussed in the literature,[5] the specific effect of natural gas has not been examined to the best of our knowledge. Natural-gas production is much different than the production of other raw materials: the initial construction investment, especially in deep-water rigs, is exorbitant while operating expenses

[5] See reference in note 9.

farther on are low. The gas is sold under long-term contracts, thereby generating a stable income flow, unlike other raw materials, the prices of which are very volatile. There is no standard price of gas due to very high transport costs; therefore, the price also reflects the contracting parties' bargaining ability. Given the special characteristics of the gas industry, we believe that the examination of the specific effect of gas exports should figure importantly in any analysis of the effect of natural-resource exports on the real exchange rate. Since we are unable to identify a process of import substitution, we examine the effect of natural-gas exports. The assumption is that the current-account improvement occasioned by the exports is identical to the effect of an improvement originating in import substitution.

Examining the effect of an increase in each country's gas exports on its exchange rate, we find that the two are not always related, at least at the same point in time. While Russia appears to have a strong negative correlation—an increase in gas exports leads to currency appreciation—in Canada the relation is weak, and in Norway and the Netherlands no relation was found at all. Notably, Russia and Norway have sovereign wealth funds that invest some government royalties abroad, a practice that may offset the pressure on the real exchange

Table 1

Panel Equation[a]

Dependent Variable: Change in Real Exchange Rate

	Model 1	Model 2	Model 3	Model 4	Model 5[c]
Change in natural gas exports (Percent of exports)	-0.48***	-0.47***	-0.32**	-0.36**	-0.46***
Change in raw materials exports (Percent of exports)		-0.41***	-0.05		
Change in per-capita GDP[b]			-0.38***	-0.38***	-0.27***
Observations	589	589	566	564	75
R^2adj	0.01	0.03	0.47	0.47	0.43

[a] Estimation method: OLS, without effects. Estimation period: 1990–2009.The panel of countries is comprised of EU27, Brazil, China, Hong Kong SAR of China, India, Macao SAR of China, Russian Federation, Malaysia, Philippines, Singapore, Thailand, Vietnam, Indonesia, Argentina, Chile, Costa Rica, Panama, and Uruguay.

[b] The increase in per-capita GDP is discounted by the direct effect of the increase in natural gas/raw materials exports.

[c] The independent variable (gas exports) ranged from 0.5 to 10 percent of trade.

* Significant at 10 percent level

** Significant at 5 percent level

*** Significant at 1 percent level

Sources of data: UNCOMTRADE, IFS, OECD.

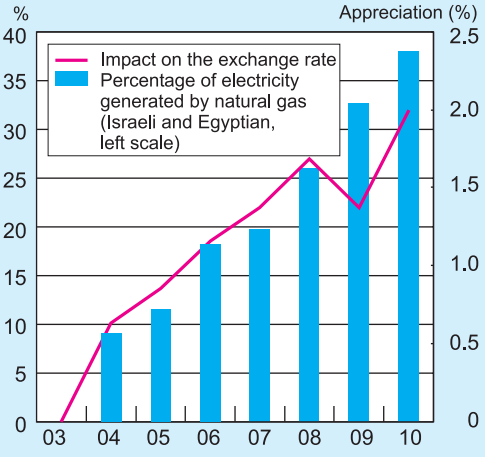
rate. The real exchange rate is influenced by additional factors, of course. Therefore, to estimate the effect of exports of gas and other raw materials on the real exchange rate, regression equations for annual rates of change in the real exchange rate were estimated (Table 1). We added the increase in per-capita GDP as a control variable that, according to the literature, has a strong effect on the real exchange rate.[6] To isolate the effect of gas exports, we discounted it from per-capita GDP as well.

The results indicate a significant impact of an increase in the export of natural gas on the real exchange rate (Model 1). This outcome recurs even when we add the increase in per-capita GDP as a control variable and even if we test larger changes in gas exports (Model 5). The estimates reported here may be downward-biased because the real exchange rate may change from the point in time when the gas is discovered, even before exports begin. However, the effect of the discovery of gas is very hard to detect.[7]

On the quantitative significance in the case of the Israeli economy, the estimates obtained show that the export of one billion dollars of gas a year, leading to a 1.5 percent overall increase in exports—will lead to appreciation of around 0.8 percent in the real exchange rate. Figure 1 shows the rise in the share of electricity produced by means of gas in recent years, and its cumulative effect on the real appreciation of the local currency, as derived from estimating the regressions, which until 2010 totaled 2 percent.

An alternative examination, based on the use of a real-exchange-rate equation for the Israeli economy and imputation of the effect of natural gas to an

Figure 2
Percentage of Electricity Generated by Natural Gas, and its Impact on the Exchange Rate, 2003-10



SOURCE: Financial Statement of the Israel Electric Corporation, 2009, and Bank of Israel estimates for 2010.

[6] M. Berka and M.B. Devereux, 2010, "What Determines European Real Exchange Rates?" National Bureau of Economic Research Working Paper 15753; B. Eichengreen, 2008, "The Real Exchange Rate and Economic Growth," Commission on Growth and Development Working Paper 4.

[7] An attempt to use future gas exports shows that real appreciation occurs about three years before gas exports increased. The coefficient that was found, 0.33, is significant and remains stable even when the growth rate of per-capita GDP in the relevant year is taken into consideration.

improvement in terms of trade, shows a stronger effect: a $1 billion increase in gas exports induces 1.5 percent appreciation. This estimate, however, is less reliable.[8]

The conclusion arising from the examination is that in the Israeli case the use of natural gas for domestic needs will have only a relatively small impact on the real exchange rate. According to our present projections, natural gas will replace imports to a value of about 3 billion dollars at the most beyond the substitution up to the present time. Because the substitution of imports has already been partially realized, and the future impact of existing fields has also been taken into account in the markets, most of the impact on the exchange rate has already occurred and has probably contributed to the real appreciation of the past two years.

However, if the "Leviathan" field is used for exports, the impact could be greater. Because of uncertainly regarding the volume of exports, it is not possible today to quantify the impact of a scenario of this kind on the exchange rate. Further, if there were to be additional discoveries of natural gas, it is very likely that Israeli will become a gas exporter.

A factor that could counterbalance the impact of the Dutch Disease is the establishment of a Sovereign Wealth Fund for the purpose of fiscal saving, a fund that would invest abroad the income from gas exports. This could help also in the intergenerational distribution of the benefits from the discovery and exploitation of this natural resource.

[8] Z. Eckstein and A. Friedman (2011). "The Equilibrium Exchange Rate for Israel."