



**BANK OF ISRAEL**

# **STATISTICAL BULLETIN**

**2014**



**June 2015**

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## Statistical Bulletin—2014

### Introduction

**Statistical Bulletin** is a new annual publication of the Bank of Israel. Central banks of advanced economies generally produce periodic statistical publications. In order for the Bank of Israel to achieve its objectives and fulfill its functions under the Bank of Israel Law, 5770-2010, the Bank manages an extensive system of information and statistics on economic activity, focused on financial areas. Likewise, the Bank provides data on economic activity for the wider public, international institutions, researchers, analysts, and others, both in Israel and abroad. This new publication was prepared by the Bank's Information and Statistics Department, which is responsible for these issues.

Against this background, Statistical Bulletin is intended to serve two main objectives:

**The first objective** is to increase the accessibility of the data and aggregates that the Bank of Israel collects and manages, for the public that is interested in data on Israel's financial system, while focusing a spotlight on the major developments in that data. The Bank of Israel is thus realizing the vision shared by many entities involved in issuing official statistics—making sure that the users of such data will be able to extract the fullest benefit from them and thus promoting the understanding of the realities of the economy.

**The second objective** is to share initiatives, research, development and methodological issues with the public, in order to expand the statistical knowledge among the interested public.

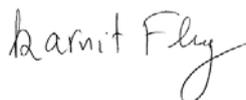
The current publication is divided into two sections:

**The first section** presents the main developments during 2014 in four main areas of financial statistics in Israel: (1) The public's financial assets portfolio, (2) the economy's activity vis-à-vis abroad, (2) the foreign exchange market, and (4) the credit market.

The main developments are presented through graphs, which depict long-term trends in the most important data, together with a short text description, and a table of selected indicators and data in each topic.

**The second section** presents three papers on statistical methodology and data processing. These were written as part of the continuing development of statistical tools and economic information for policy analysis needs, and their implementation in the Bank of Israel. The three papers are (1) Developments in the economy's basic account, (2) A "MODS" (Multi-Layer Outlier Detecting System) to warn of extraordinary developments in financial markets, and (3) Rapid real information in Israel and in international comparison. The publication can be accessed on the Bank of Israel website as well. For readers' ease, the online version has the main data compiled in separate files, and includes links to current data on the same issue found on the Bank's website.

Dr. Karnit Flug



Governor of the Bank of Israel



## Table of Contents

### Part One

Main developments in four main areas of financial statistics in Israel in 2014:

a. The public's financial assets portfolio.....	7
b. Economic activity vis-à-vis abroad.....	15
c. The foreign exchange market.....	24
d. The credit market .....	31

### Part Two

Papers on statistical methodology and economic data, and their implementation at the Bank of Israel:

Developments in the Economy's Basic Account over the Past Two Decades .....	41
Multi-Layer Outlier Detecting System (MODS) .....	50
Rapid Real Data in Israel, and an International Comparison.....	59

# Part One



Main developments in four main areas of financial statistics in Israel in 2014:

- A. The public's financial assets portfolio
  - B. Economic activity vis-à-vis abroad
  - C. The foreign exchange market
  - D. The credit market
-

## A. THE PUBLIC'S FINANCIAL ASSETS PORTFOLIO<sup>1</sup>

The increase in the balance of the public's asset portfolio continued in 2014, but the pace of the increase moderated when compared to the previous two years.

The downward trend in the portion of the portfolio managed directly by the public continued, in favor of an increase in the portion managed by institutional investors.

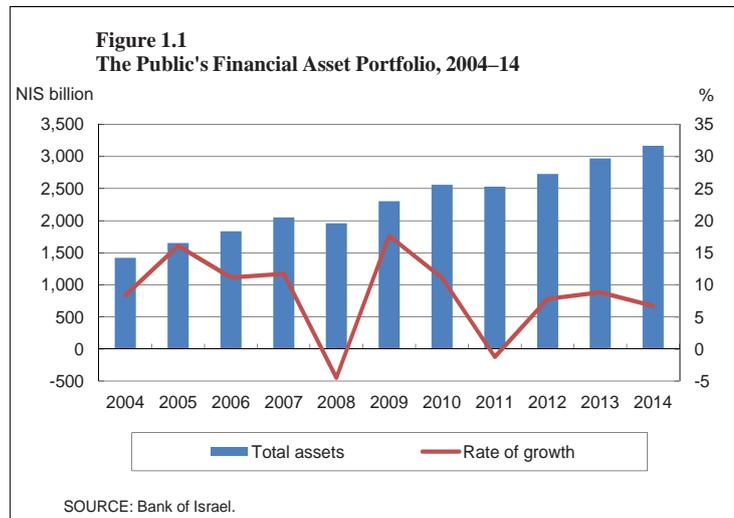
The public's direct holdings are mainly of deposits and shares traded in Israel. Institutional investors hold mainly government bonds and foreign assets traded abroad. The risk profile in the portfolio managed by institutional investors remained high compared with a decline in the risk profile of the portfolio managed directly by the public.

In 2014, against the background of the low interest rate, the public accelerated the pace of growth of the cash and current accounts component of the asset portfolio, and in contrast, made net redemptions from medium and long-term deposits and from money market funds. Institutional investors continued increasing the volume of assets abroad, in parallel with a decline in investments in shares in Israel and in corporate bonds.

### 1. TOTAL ASSET PORTFOLIO

In 2014, the increase in the balance of the public's asset portfolio continued, but the pace of increased moderated compared to the previous two years.

The value of the asset portfolio increased by about NIS 200 billion (about 6.7 percent) in 2014, to about NIS 3.17 trillion. The increase is the result of an increase in the value of the tradable portfolio abroad, an increase in cash and current account balances, and an increase in outstanding government bonds and *makam*. There were net realizations during the period in the shares portfolio and in corporate bonds traded in Israel.

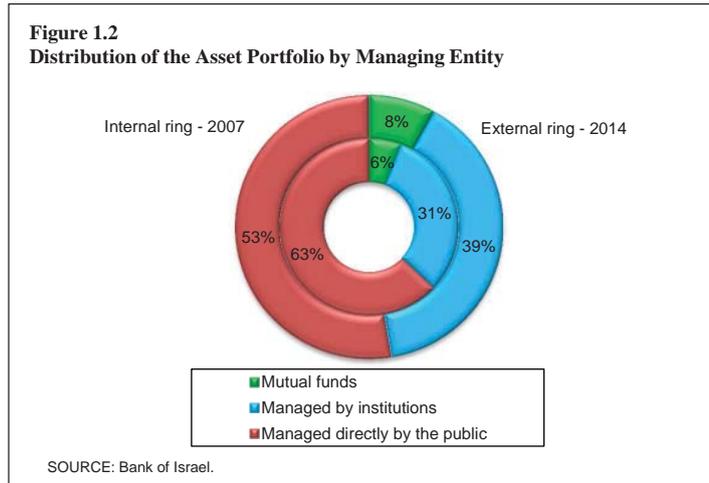


<sup>1</sup> The public's financial assets portfolio includes the financial investments of households and of the nonfinancial business sector.

In 2014, the downward trend in the portion of the portfolio managed directly by the public and the upward trend in the portion of the portfolio managed by institutional investors continued.

In recent years, there has been a decline in the portion of assets managed directly by the public, in favor of an increase in the portion of long-term savings managed by institutional investors. The volume of net new investment in pension entities also increased due to the implementation of compulsory pension arrangements, which came into effect at the beginning of 2008.

At the end of 2014, about 53 percent of assets (about NIS 1.7 trillion) were managed directly by the public, a decline of about 10 percentage points since 2007. The portion managed by institutional investors increased during the same period by about 8 percentage points, to about 39 percent (about NIS 1.2 trillion).

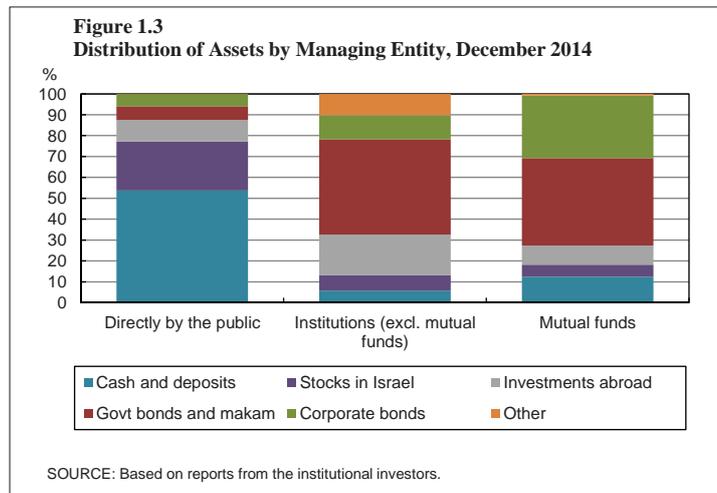


At the end of 2014, the public's direct holdings were mainly of deposits and shares traded in Israel, while institutional investors held mainly government bonds and foreign assets traded abroad.

Government bond and *makam* holdings account for an average of about 44 percent of the portfolio managed for the public by the institutional investors and mutual funds, compared with about 7 percent in the portfolio managed directly by the public.

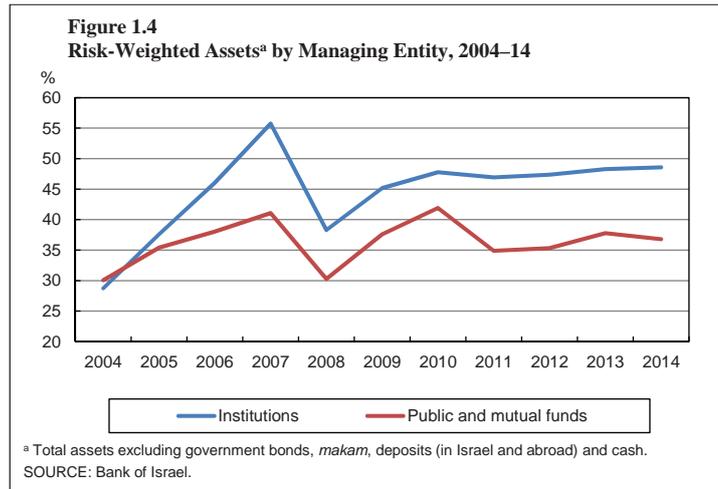
The public holds private bonds in Israel mainly through mutual funds (about 30 percent of the funds' total assets).

The portfolio abroad is managed mainly by institutional investors, but there is also a marked increase in the volume of investments abroad directly by the public and through mutual funds.



In 2014, the ratio of risk assets held directly by the public and by mutual funds declined, while it remained virtually unchanged in the portfolio managed by the institutional investors, compared to previous years.

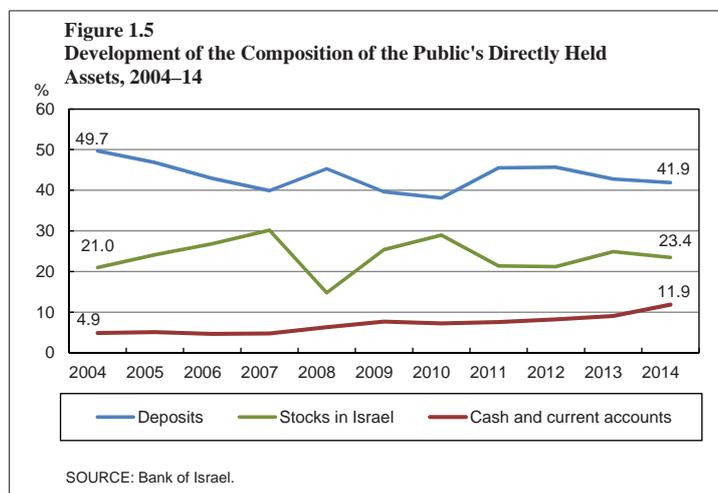
Since the cancellation of tax discrimination on investments abroad in 2004, the rate of risk assets held by institutional investors increased significantly and has remained high compared to the rate of risk assets held directly by the public and by mutual funds (49 percent compared to 37 percent). As noted, institutional investors hold a different mix of assets and for longer periods, than the public's direct holdings.



## 2. THE PORTFOLIO MANAGED DIRECTLY BY THE PUBLIC AND THROUGH MUTUAL FUNDS

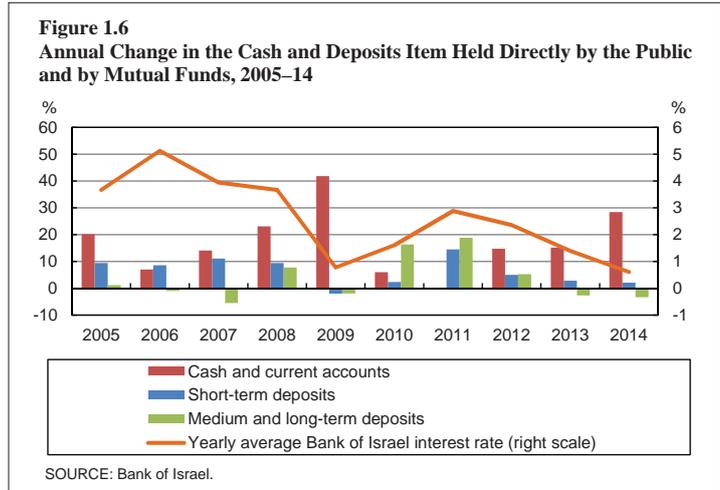
In 2014, there was an increase in cash and current accounts held directly by the public, in parallel with a decline in deposits and shares in Israel.

In the portfolio managed directly by the public, there has been a substitution over the years between the deposits component and the shares in Israel component. Both of these components declined in 2014, in parallel with a significant increase in the cash and current accounts component.



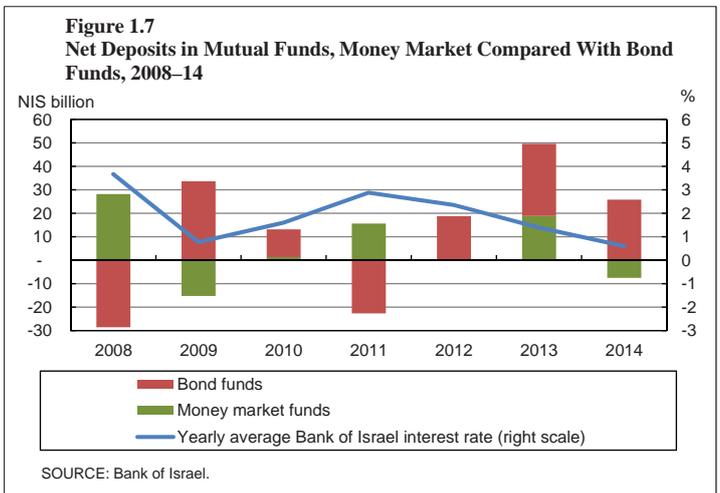
The increase in the cash and current accounts component of the public's assets portfolio accelerated in 2014. In contrast, the public made net redemptions from medium and long-term deposits.

In 2014, and in 2009, against the background of low interest rates, there were significant increases in the growth of the cash and current accounts component, in parallel with a decline in the deposits component across all durations.



There were net redemptions from money market funds as well in 2014, for the first time since 2009.

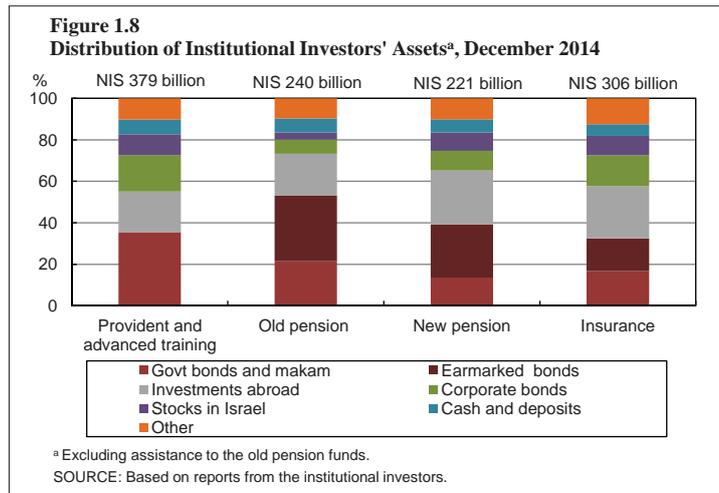
The distribution of deposits in mutual funds by specialization indicates a negative correlation between the money market funds and the bond funds. During periods when the interest rate was high, there was an increase in deposits in money market funds in parallel with withdrawals from bond funds. During periods in which the interest rate is low, there is an increase in deposits in bond funds in parallel with withdrawals from money market funds.



### 3. THE PORTFOLIO MANAGED BY INSTITUTIONAL INVESTORS

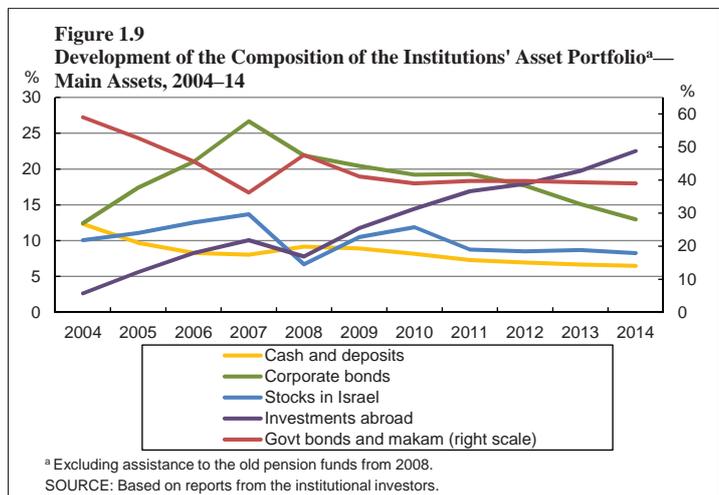
At the end of 2014, the mix of assets managed by the various institutional investors is similar.

The distribution of assets managed by the institutional investors shows that the various institutional investors hold a mix of assets that is relatively similar, except for investments in earmarked bonds, which is higher in the pension funds.

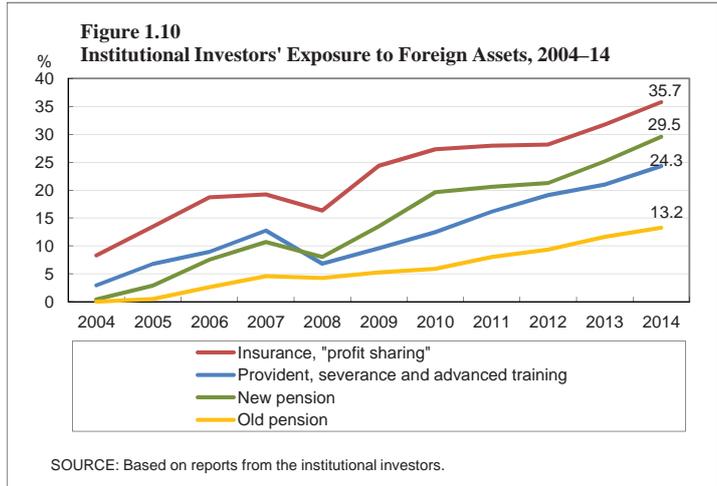


In 2014, the growth in the share of institutional investors' holdings abroad continued, further to the trend since the tax reform of 2004.

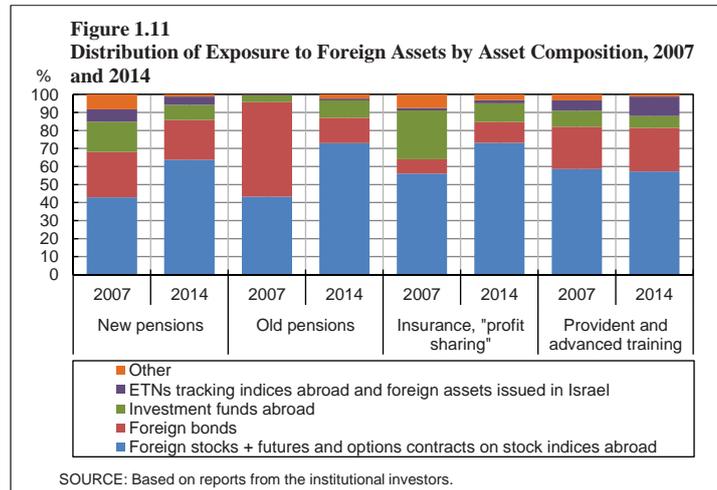
Since 2007, the share of institutional investors' holdings held abroad has increased by about 12 percentage points, in parallel with a decline of about 14 percentage points in their holdings of corporate bonds. Government bonds and *makam* remained relatively stable since 2010, comprising about 40 percent of total holdings.



The rate of institutional investors' exposure to foreign assets continued to increase in 2014 among all institutions. The largest change in 2014 was concentrated in the new pension funds, which increased their exposure to foreign assets by about 4.4 percentage points, to about 30 percent. The insurance companies have the highest rate of foreign assets among the institutional investors—about 36 percent—while the old pension funds have the lowest rate, only about 13 percent.

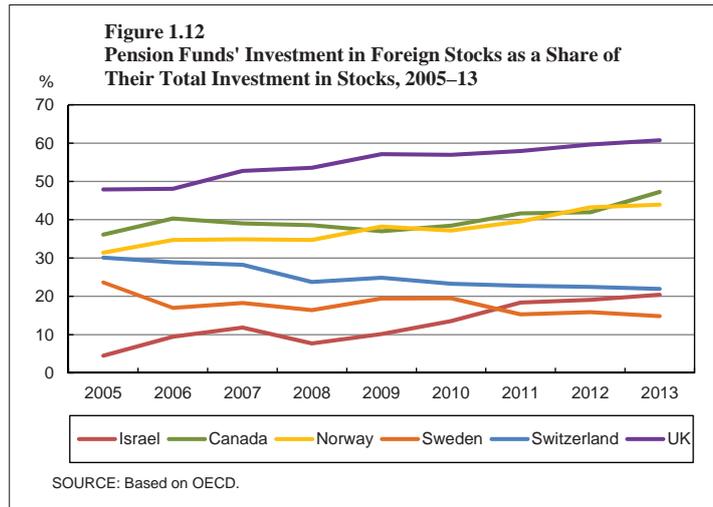


The increase in institutional investments in foreign assets in recent years was concentrated mainly in stocks. Between 2007 and 2014, there was a change in the composition of institutional investors' holdings of foreign assets. There was a marked increase in the foreign shares traded abroad component in parallel with a decline in holdings of foreign bonds and investment funds. This substitution is particularly significant among the old pension funds.



Investment in foreign shares as a percentage of total investment in shares by the pension funds in Israel remains low by international comparison.

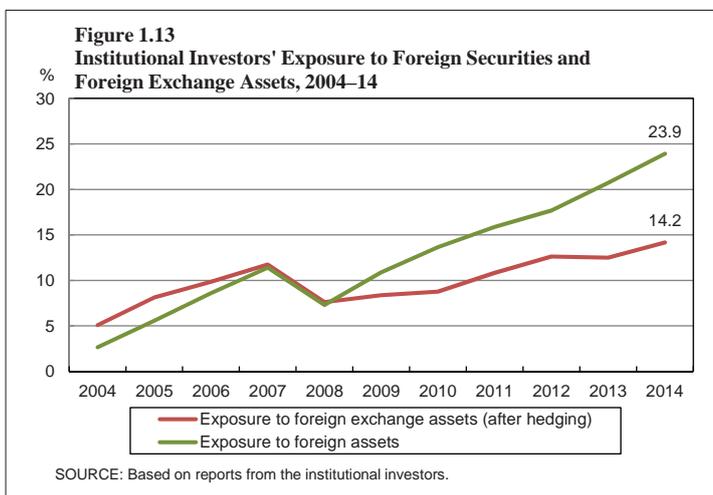
In 2013, Israeli pension funds' investment in foreign shares averaged about 20 percent of their total investment in stocks, similar to countries like Sweden and Switzerland. Pension funds in the UK invested more than 50 percent in foreign shares. Those in Norway and Canada invested an average of 45 percent in foreign shares out of their total investment in shares.



In 2014, with the change in the trend of the exchange rate, institutional investors reduced hedging transactions and increased exposure to exchange rate risk.

Starting in 2009, the institutional investors partially hedged their foreign exchange assets against exchange rate risk, due to the prolonged appreciation trend of the shekel. In August 2014, this trend was halted.

In 2014, the institutional investors increased their rate of exposure to foreign securities to about 24 percent. The overall rate of exposure to foreign exchange assets was only about 14 percent at the end of the year.



Some of the institutional investors do not tend to hedge the foreign shares component against exchange rate risk.

Starting in 2009, the increase in the balance of foreign exchange assets (including derivatives) of all institutional investors has been correlated with the increase in their holdings of foreign shares. Some institutional investors do not hedge the investment in shares against exchange rate risks, hedging only other foreign exchange assets.



Main indicators in the public's asset portfolio (percent)		2007	2008	2009	2010	2011	2012	2013	2014
Risks and liquidity	Tradable assets	52.2	40.6	50.7	54.2	49.8	50.9	53.0	52.9
	Risk assets <sup>a</sup>	45.1	33.2	40.5	44.3	39.6	40.2	42.2	41.9
	Foreign assets <sup>b</sup>	11.6	9.8	11.0	11.1	11.7	11.9	12.6	14.2
	Foreign exchange assets <sup>c</sup>	18.7	17.0	17.2	16.5	17.6	17.6	18.2	20.7
	Unindexed assets <sup>d</sup>	70.3	62.3	67.6	69.5	68.0	67.6	68.6	70.1
Portfolio management	Liquid assets <sup>e</sup>	24.4	29.0	23.9	22.3	25.4	24.7	23.8	24.6
	Investment through institutional investors	31.2	33.6	35.0	34.9	36.5	37.8	38.2	39.3
	Investment through mutual funds	5.8	5.0	5.7	6.0	5.6	6.2	7.7	8.0
	Investment directly by the public	62.9	61.4	59.3	59.0	57.9	56.0	54.1	52.7
Portfolio total	Asset portfolio as a share of GDP	282.6	245.3	283.9	294.1	273.6	275.0	283.0	291.2
	Value of the public's asset portfolio (NIS billion)	2,051	1,959	2,305	2,561	2,530	2,728	2,969	3,168

<sup>a</sup> Total assets excluding government bonds, *makam*, deposits in Israel and abroad, and cash.

<sup>b</sup> Israelis' investments abroad, including investments by institutional investors abroad.

<sup>c</sup> Assets indexed to foreign currency + shares abroad.

<sup>d</sup> All assets excluding CPI-indexed assets.

<sup>e</sup> Cash, deposits of up to one year in Israel, and *makam*.

SOURCE: Bank of Israel.

## B. THE ECONOMY'S ACTIVITY VIS-À-VIS ABROAD—THE FINANCIAL ACCOUNT

The trend of growth in the flow of Israelis' investment abroad, which has characterized the economy for the past 6 years, continued in 2014. The private sector's financial investments in foreign shares continued, as did the growth in foreign currency reserves, as a result of continued foreign exchange purchases by the Bank of Israel. The increase in investment in shares, combined with price increases in the capital market, led to a change in the composition of the private sector's asset portfolio abroad. There was an increase in the portion of shares in the portfolio, resulting in an increase in the portion of risk assets as well.

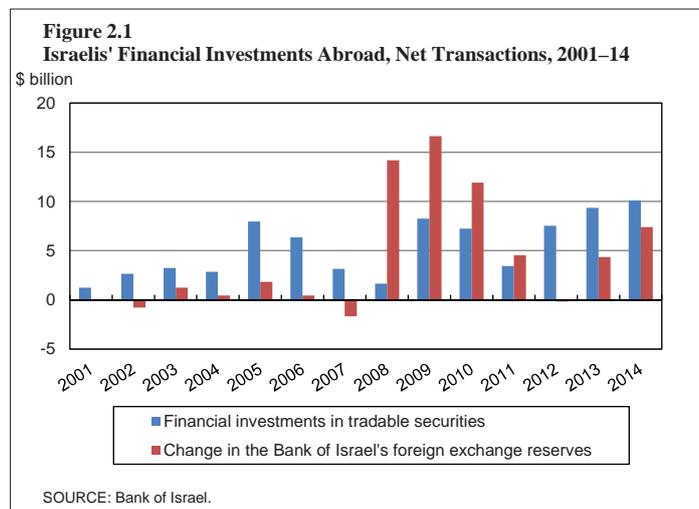
In terms of nonresidents' investment in the Israeli economy, there was significant growth in investment in securities in all channels in 2014, particularly investment in government bonds and *makam*, compared to large realizations in those channels in the previous three years. There was also significant growth in 2014 in the value of Israeli shares held by nonresidents. The dominance of the increase in the Bank of Israel's foreign exchange reserves in Israelis' overall activity vis-à-vis abroad was reflected in the rapid growth of total short-term assets, and led to continued improvement in the economy's liquidity in foreign exchange.

### 1. ISRAELIS' INVESTMENTS ABROAD

In 2014, the trend of growth in the flow of Israelis' investments abroad and in the Bank of Israel's foreign exchange reserves continued.

In recent years, the increase in the flow of investments abroad derived mainly from financial investments by the nonbank private sector in foreign shares.

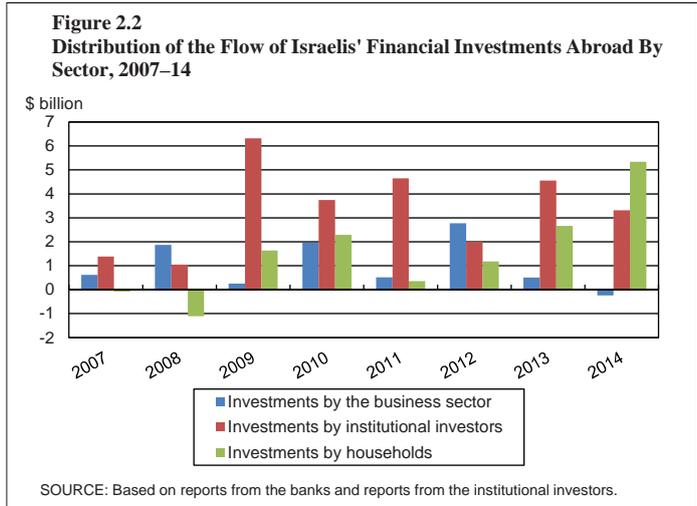
In recent years, the foreign exchange reserves also increased markedly, as a result of the Bank of Israel's foreign exchange purchasing policy.



The trend of growth in financial investments abroad was concentrated in investments by households and by institutional investors in the past two years.

The institutional investors began investing abroad as part of the diversification of their investments since the tax reform in 2004, which cancelled the tax discrimination on investments abroad.

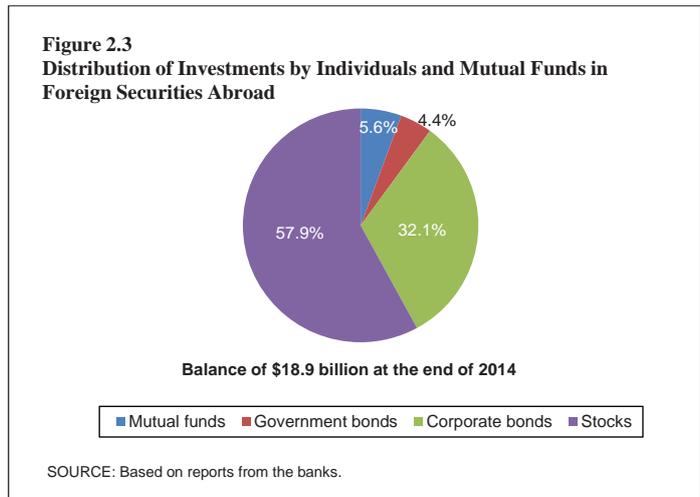
In 2014, households (individuals and through mutual funds) were prominent, with a flow of financial investments abroad totaling about \$5.7 billion, of which about \$3.1 billion was invested in foreign bonds—a significant increase over previous years.



At the end of 2014, the balance of households' (individuals and mutual funds) investment abroad was concentrated mainly in shares and corporate bonds.

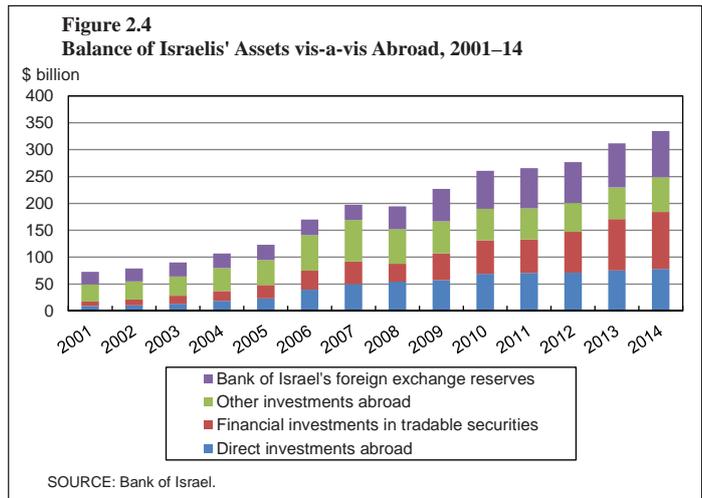
Households invest abroad mainly in shares and corporate bonds. Investment in foreign government bonds is relatively small (4.5 percent).

An analysis of investment concentration shows that households' investments in corporate bonds are spread over a large number of bonds.



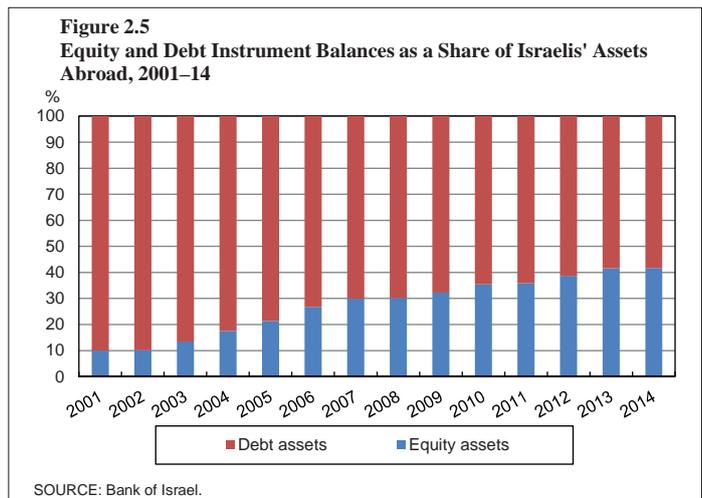
The trend of growth in Israelis' investment abroad in recent years was reflected in continued growth of the balance of assets vis-à-vis abroad.

The increase in investments abroad, combined with share price increases on the international markets led to a continued increase in the balance of assets vis-à-vis abroad, which was about \$334 billion at the end of 2014.



The increase in the balance of Israelis' investments in foreign shares was also reflected in an increase in their portion within the assets portfolio abroad.

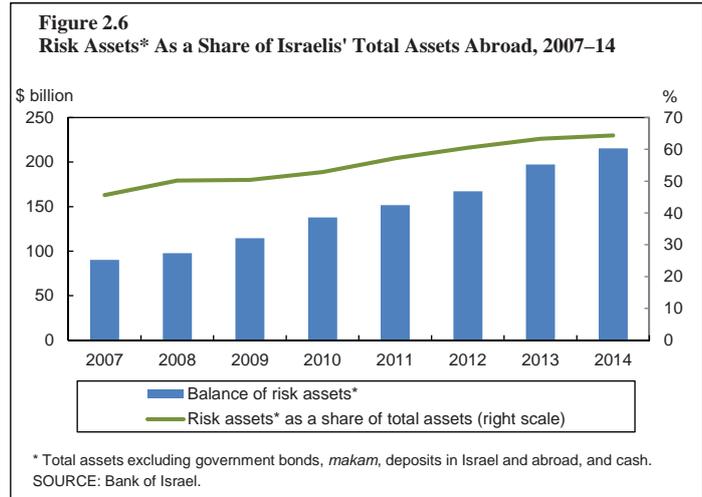
The change in the mix of assets held abroad by Israelis indicates a continued decline in the share of deposits, to about 9 percent of the assets portfolio at the end of 2014. In contrast, there was a continued increase in shares, to about 40 percent of the portfolio at the end of 2014.



The change in the mix of assets abroad was also reflected in the upward trend in the weight of risk assets\*.

In 2014, the long-term upward trend in the weight of risk assets out of total assets abroad continued.

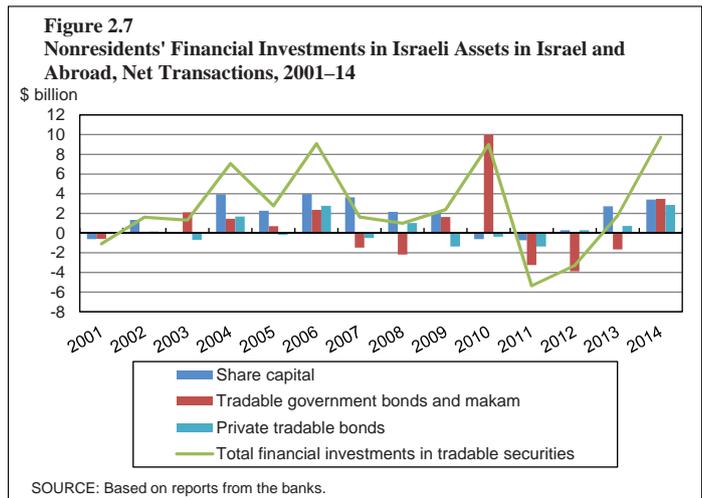
Since 2007, the rate of risk assets has increased by about 19 percentage points, to about 64 percent. The share price increases in the markets between 2012 and 2014 contributed to this.



## 2. NONRESIDENTS' INVESTMENT IN ISRAEL

In 2014, there was an increase in the flow of financial investments by nonresidents in Israel, in contrast to the trend between 2011 and 2013.

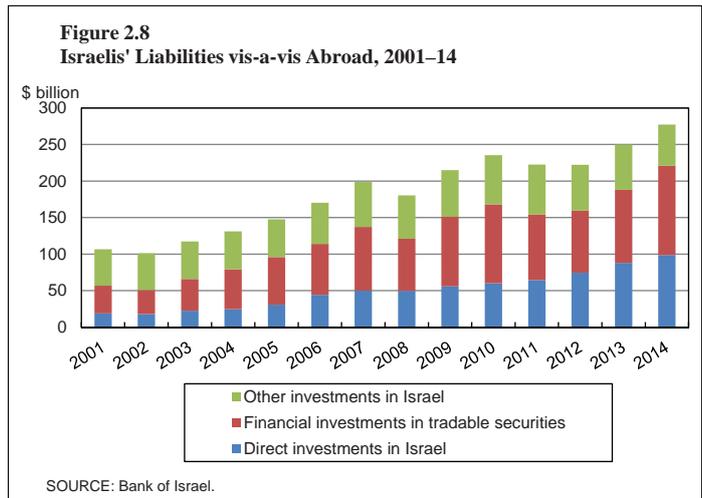
Nonresidents' financial investments were concentrated in government bonds and *makam* and in Israeli shares traded in Israel and abroad. Investments in government bonds and *makam* in 2014 were prominent against the background of the extended period of nonresidents' realizations of short-term debt instruments, which began in mid-2011.



The increase in investments combined with the increase in share prices was reflected in continued growth of the balance of liabilities to abroad in 2014.

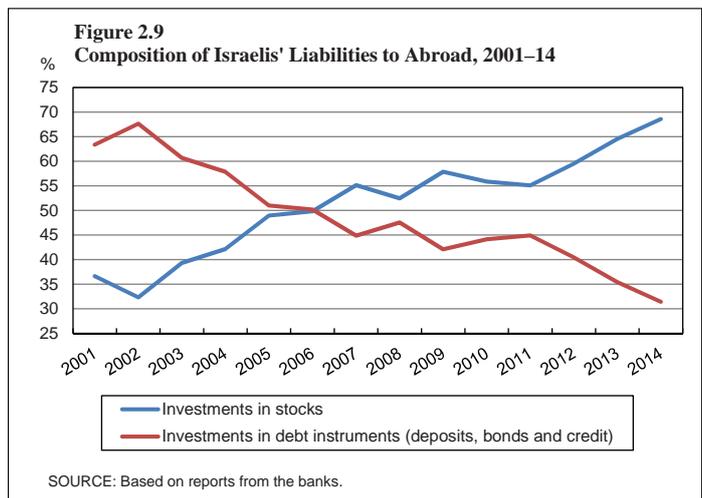
The gross balance of liabilities to abroad was about \$277 billion at the end of 2014.

The significant growth in the flow of financial and direct investments, together with the increase in share prices, led to an increase of about 10.9 percent in the balance of liabilities to abroad.



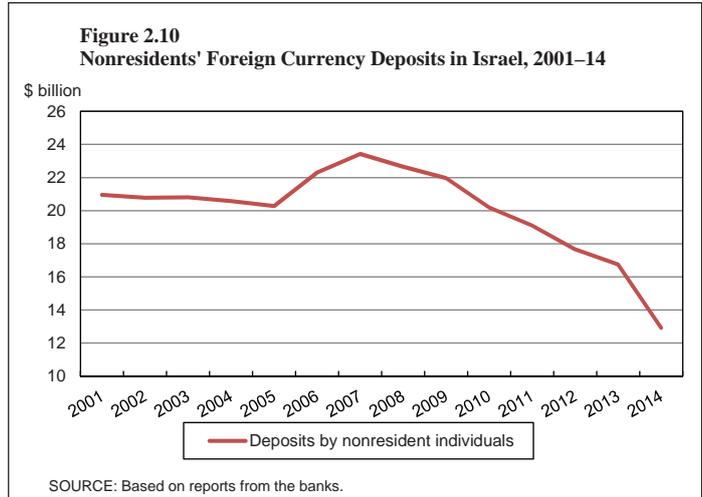
In 2014, the change in the composition of liabilities to nonresidents continued, toward increased capital liabilities.

Similar to the composition of Israelis' asset portfolio abroad, there was also a marked upward trend in the weight of shares (about 68 percent), and a decline in the weight of deposits, bonds and credit (about 31 percent) in liabilities toward nonresidents.



The sharp downward trend in nonresidents' deposits in Israeli banks contributed to the change in the composition of liabilities to abroad.

The trend of net withdrawals from nonresidents' foreign exchange deposits in Israeli banks continued in 2014. This trend began in 2007, and accelerated in 2013 and 2014, when they totaled about \$5 billion.

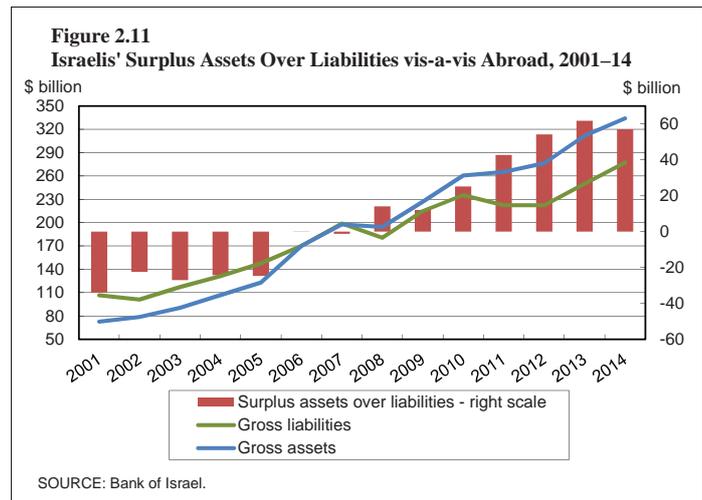


### 3. SURPLUS ASSETS OVER LIABILITIES VIS-À-VIS ABROAD

In 2014, the upward trend in the surplus of assets over liabilities vis-à-vis abroad was halted.

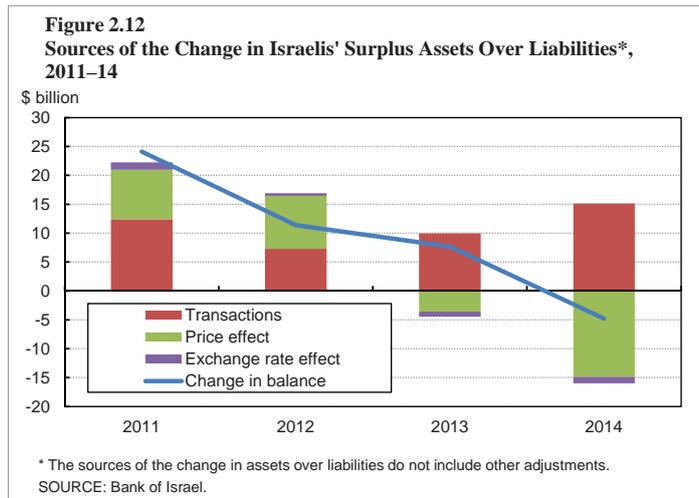
The continued increase in the value of gross liabilities vis-à-vis abroad (about \$27 billion, 10.9 percent) was only partly offset by the flow of Israelis' investments abroad in all channels (about \$22 billion, 7.2 percent). As a result, the surplus of assets over liabilities declined for the first time since 2009, to \$51.4 billion at the end of 2014.

In contrast, the increase in the surplus of assets over liabilities vis-à-vis abroad in debt instruments only (negative external debt) continued, reaching \$97 billion at the end of 2014.



The decline in the surplus of assets in 2014 reflected the significant price effect on the increase in liabilities to nonresidents.

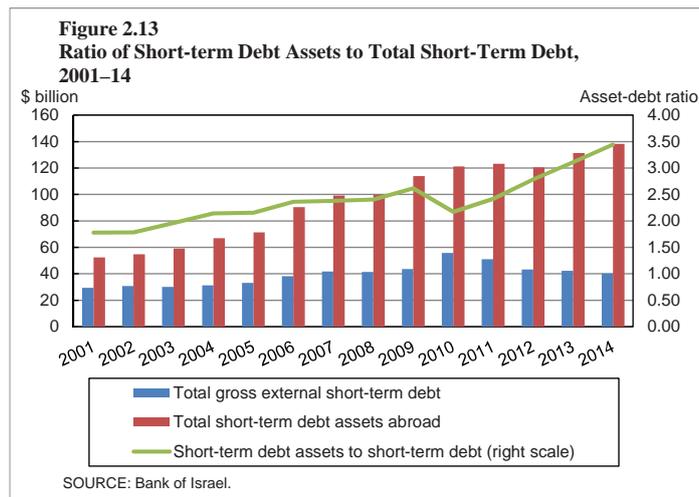
In 2014, the flow of Israelis' investments abroad was about \$15 billion greater than the flow of nonresidents' investments in Israel. Despite this, the price effect on the increase in the value of liabilities was about \$20 billion greater than its effect on the value of assets. Nonresidents hold shares of a small number of large Israeli companies, including Teva, the value of which increased markedly, mainly in the first half of the year.



**The continued improvement in liquidity vis-à-vis abroad.**

In 2014, the upward trend in the short-term debt assets to short-term debt ratio continued, mainly due to the increase in the Bank of Israel's foreign exchange reserves.

The volume of short-term debt assets was 3.4 times greater than the volume of short-term debt at the end of the year. In 2013–14, the increase in liquidity vis-à-vis abroad was mainly the result of an increase in short-term debt assets. In 2011–12, the increase in this ratio was mainly the result of a decline in short-term debt against the background of nonresidents' exits from *makam*.

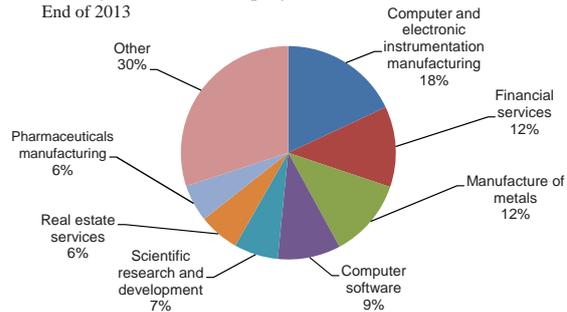


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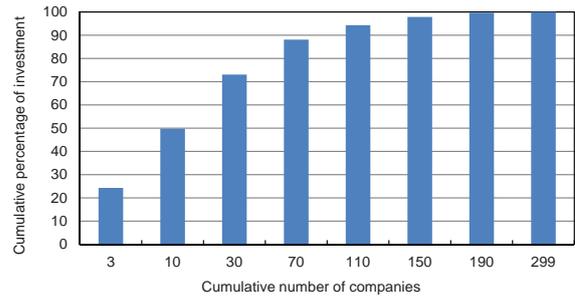
CONCENTRATION AND INDUSTRY DISTRIBUTION OF DIRECT INVESTMENTS

**Figure 2.14**  
Distribution of Nonresidents' Direct Investment in Israel\* by Industry of the Israeli Company  
End of 2013



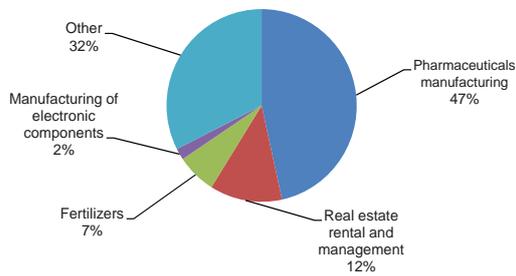
\* Nonresidents' direct investments in Israel are concentrated in the computers, financial services and metal manufacturing industries. Industries that comprise 2 percent or less of nonresidents' total direct investment are grouped in "Other".

**Figure 2.15**  
Concentration of Nonresidents' Direct Investment in Israel\*  
End of 2013



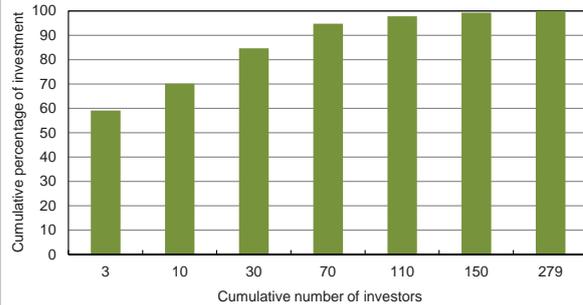
\* Nonresidents' direct investment in Israel is relatively concentrated. About 70 percent of investment is invested in 30 companies.

**Figure 2.16**  
Distribution of Israelis' Direct Investment Abroad\* by Industry of the Foreign Company  
End of 2013



\* Israelis' direct investment abroad is concentrated in the pharmaceuticals industry. Industries that comprise less than 2 percent of Israelis' total direct investment abroad are grouped in "Other".

**Figure 2.17**  
Concentration of Israelis' Direct Investment Abroad  
End of 2013



\* Israelis' direct investment abroad is highly concentrated. About 70 percent of investment is held by 10 investors.

\* Private nonbanking sector, reporting companies only, comprising 67 percent of the balance.

SOURCE: Based on company reports.

## C. THE FOREIGN EXCHANGE MARKET—THE

<b>Main indicators of activity vis-à-vis abroad</b>						
		<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Indicators (percent)</b>						
Financial robustness of the economy	Gross external debt to GDP	43.4	43.6	36.7	31.6	34.9
Liquidity vis-à-vis abroad	Short-term debt assets to total short-term debt	208.2	241.7	278.3	311.0	344.3
	Foreign exchange reserves to short-term debt assets	62.6	60.7	63.0	62.3	62.3
Risks to the value of Israeli's assets abroad	Risk assets* as a share of total assets	54.5	57.2	60.5	63.3	64.4
	Stocks as a share of total assets	34.8	34.1	36.8	39.6	39.2
Openness of the economy vis-à-vis abroad	Assets + liabilities (vis-à-vis abroad) as a share of GDP	198.5	201.6	187.8	185.9	218.5
	Imports + exports (goods and services) as a share of GDP	68.0	71.4	72.3	64.5	62.2
Real contribution of abroad to the economy (liabilities)	Flow of direct investment as a share of gross capital inflow	0.3	1.7	7.2	1.0	0.7
	Flow of direct investment as a share of GDP	2.2	3.8	3.0	3.9	2.3
<b>Main raw figures - \$ billion</b>						
Balances	Balance of assets abroad	252.8	265.2	276.5	311.8	334.3
	<i>of which:</i> Reserves	70.9	74.9	75.9	81.8	86.1
	Balance of liabilities to abroad	234.2	222.5	222.4	250.0	277.3
	Surplus assets over liabilities	18.6	42.7	54.1	61.8	57.0
	Net external debt	-53.7	-64.5	-72.0	-86.5	-97.2
Transactions	Israelis' investments abroad	28.4	17.8	8.4	22.4	24.7
	<i>of which:</i> Direct investments	8.0	9.2	3.3	4.7	4.0
	Financial investments	9.4	3.4	8.0	9.4	10.1
	Nonresidents' investments in Israel	18.1	5.4	1.1	12.4	9.5
	<i>of which:</i> Direct investments	5.5	9.1	8.1	11.8	6.4
	Financial investments	9.0	-5.4	-3.3	1.8	9.8
Basic account	Net current account surplus	7.9	3.9	2.1	6.9	8.1
	Net foreign direct investment	-2.6	-0.1	4.8	7.1	2.5
	Basic account surplus	5.3	3.9	6.9	14.0	10.5

\* Risk assets: Total assets excluding government bonds, *makam*, deposits in Israel and abroad, and cash.

SOURCE: Bank of Israel.

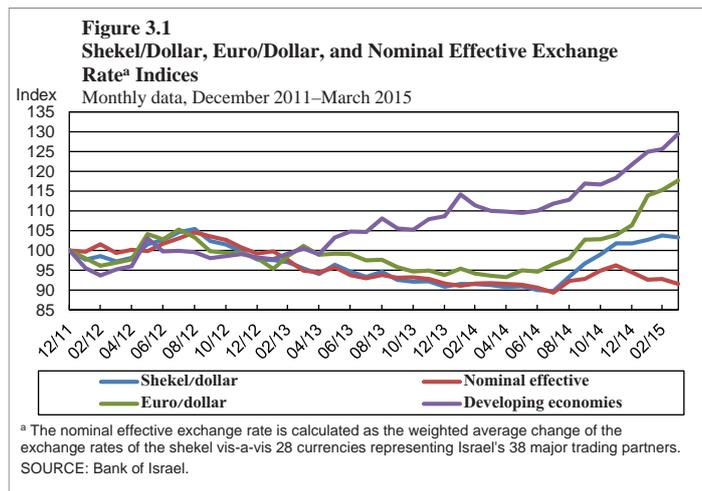
## EXCHANGE RATE AND SECTORAL CONVERSIONS

In August 2014, there was a change in the trend of the shekel's exchange rate, with the shekel depreciating by about 16 percent against the dollar between August 2014 and March 2015. This followed a prolonged appreciation of about 14 percent over about 2 years (from September 2012). In terms of the nominal effective exchange rate, which represents Israel's major trading partners, the shekel depreciated by only about 2.1 percent.

There was a parallel change in the activity of the main sectors in the foreign exchange market. Nonresidents shifted to net foreign exchange purchases and continued to increase the balance of their short-term shekel liabilities. Institutional investors increased their exposure to foreign exchange by reducing their hedging of foreign assets. In contrast, the nonfinancial sector shifted to net foreign exchange sales, mainly through increased foreign exchange sales by exporters and reduced foreign exchange purchases by importers.

In August 2014, there was a change in the trend of the shekel's exchange rate, with the shekel depreciating markedly against the dollar. This trend continued in the first quarter of 2015.

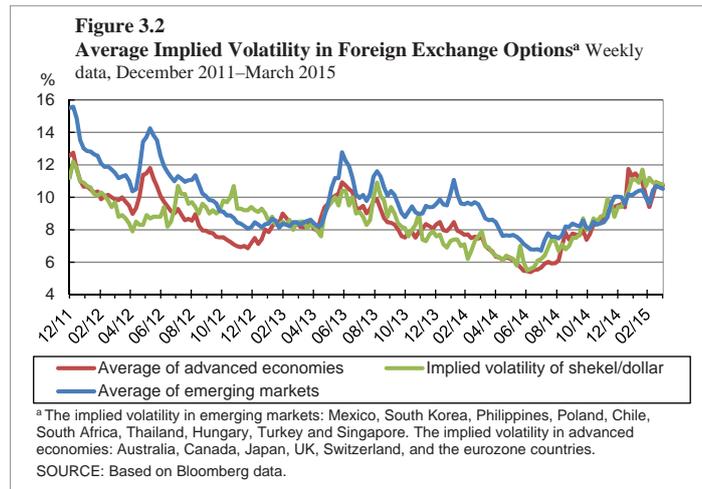
Summing up the period from August 2014 until March 2015, the shekel depreciated by about 16.1 percent against the dollar, and by about 2.1 percent in terms of the nominal effective exchange rate. Globally, the dollar strengthened by 10 percent against the euro, by 9 percent against the Swiss franc, and by 16 percent against the Japanese yen. During the period, the dollar strengthened by about 14 percent on average against the currencies of developing economies as well.



In parallel with the change in trend of the exchange rate in August 2014, there was also an increase in the expected volatility indices of the exchange rates in Israel and globally.

The average monthly level of the implied volatility of foreign exchange options in Israel, which represents the expected volatility of the exchange rate, increased by about 5 percentage points between the middle of 2014 and March 2015.

In parallel, the implied volatility of foreign exchange options in emerging markets increased by 3 percentage points, and in advanced economies it increased by 5 percentage points during the period.

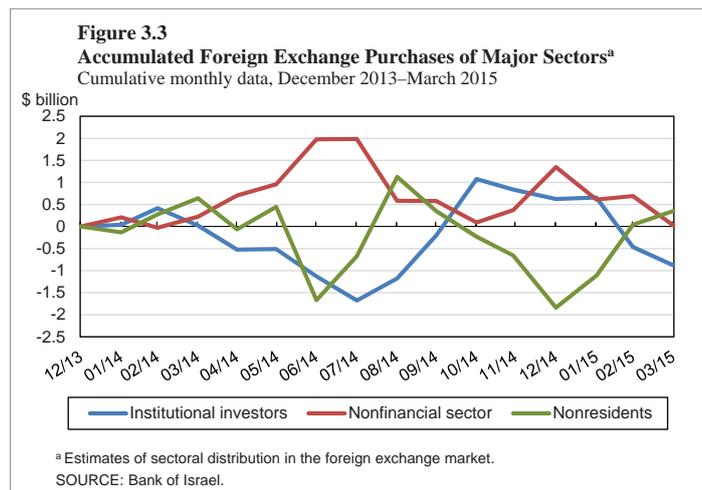


In August 2014, there was a change in the activity of the main sectors in the foreign exchange market.

Estimates of the sectoral distribution of foreign exchange sales and purchases in the market show that during July 2014, nonresidents shifted to net foreign exchange purchases following a prolonged trend of sales. In August, institutional investors joined in the purchases.

The nonfinancial sector, which is generally a net purchaser of foreign exchange, became a net seller in August 2014. These trends reversed in the fourth quarter of 2014.

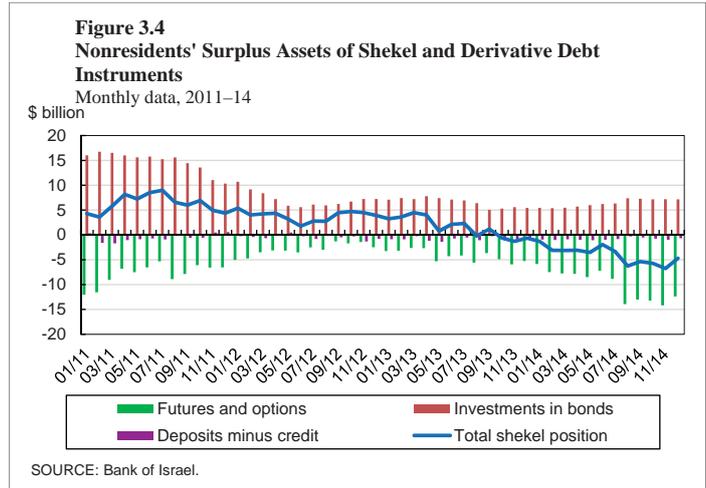
In the first quarter of 2015, nonresidents resumed purchasing foreign exchange in parallel with the renewed depreciation of the shekel. In contrast, institutional investors and the nonfinancial sector were net sellers of foreign exchange during that period.



The shift of nonresidents to purchasing foreign exchange in August 2014 was reflected in the continued increase in the balance of their shekel liabilities, through futures transactions.

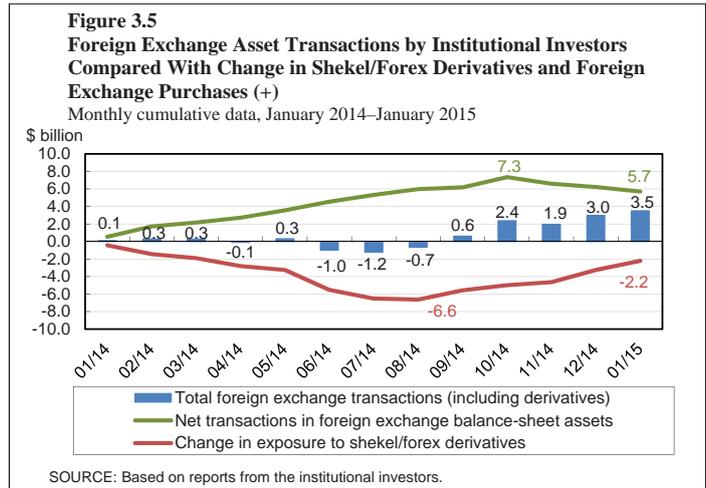
Nonresidents continued to increase their shekel liabilities in 2014, through derivative instruments, a trend that began in mid-2013.

In the past two years, nonresidents have steadily reduced their surplus shekel short-term assets (bonds, *makam* and derivatives). This balance reached a peak of about \$9 billion in mid-2011. In the third quarter of 2013, nonresidents shifted to surplus shekel liabilities.



Starting in August 2014, institutional investors reduced their hedging assets against foreign exchange risks.

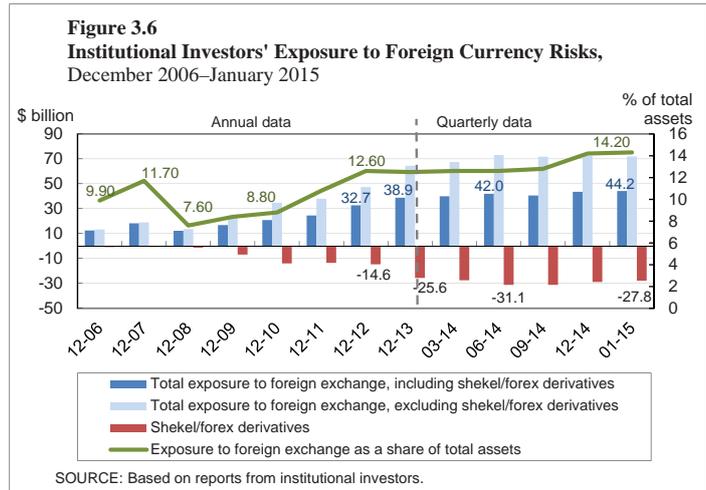
Starting in August 2014, institutional investors reduced the balance of foreign exchange sales futures transactions. This balance increased significantly in recent years, to about \$30 billion, as a result of a strategy of hedging investments abroad, due to the prolonged appreciation of the shekel.



Starting in August, the reduced scope of hedging by institutional investors, in parallel with continued investment in foreign securities, contributed to a gradual increase in institutional investors' share of exposure to foreign exchange out of total assets.

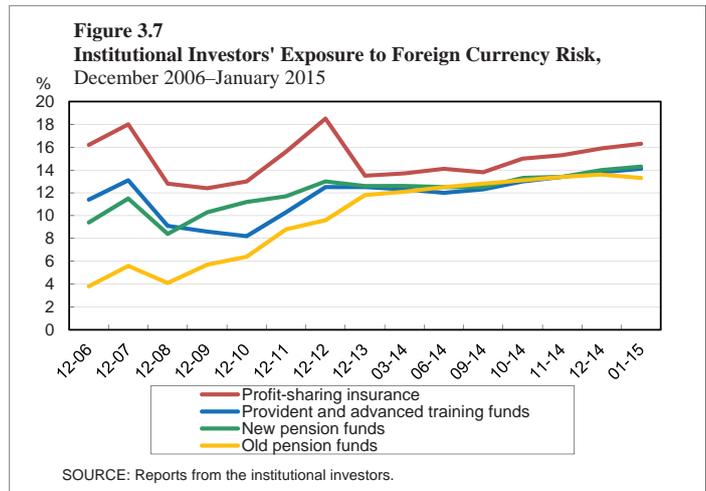
Institutional investors' share of exposure to foreign exchange increased from 12.6 percent in July 2014 to 14.2 percent in December 2014. The balance of foreign exchange assets was \$43.5 billion at the end of 2014.

The increase in exposure to foreign exchange was characteristic of all institutional investors during this period.



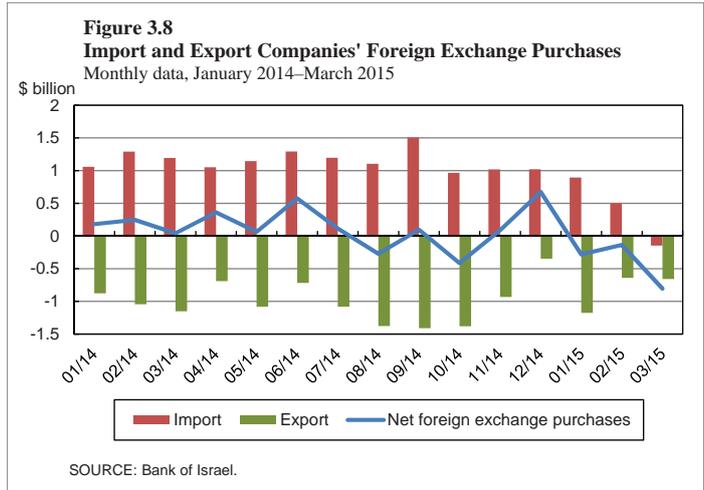
Starting in 2013, there has been a marked convergence of institutional investors' rates of exposure to foreign exchange, to a level between 14 percent and 16 percent of total assets.

Between mid-2011 and the end of 2012, insurance companies increased their exposure to foreign exchange to about 18 percent of total assets, compared to only about 12 percent in provident funds and new pension funds, and about 10 percent in the old pension funds. Starting in 2012, there has been a marked convergence in rates of exposure to foreign exchange risk.



The nonfinancial sector shifted to net sales against the background of the change in trend of the exchange rate in August 2014.

The change in the balance of net conversions of exporters and importers is prominent, alongside the acceleration of the shekel's depreciation. Between August and October 2014, and in the first quarter of 2015, exporters increased net sales of foreign exchange, while importers reduced their net purchases of foreign exchange.



ZOOM IN



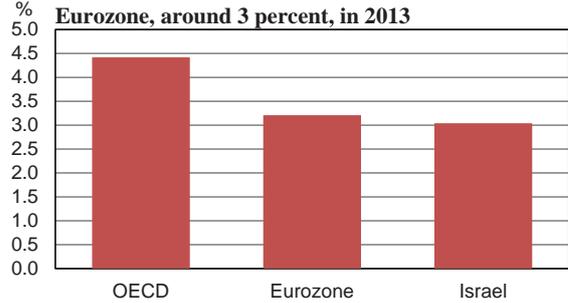
CONCENTRATION AND INDUSTRY DISTRIBUTION IN THE FOREIGN EXCHANGE MARKET

**Figure 3.9**  
The finance and insurance industry made up most of forex trading volume<sup>a</sup> by Israeli residents in 2014



<sup>a</sup> Excluding swap transactions.  
SOURCE: Bank of Israel.

**Figure 3.10**  
Average Daily Forex Derivative Trading Volume as a Share of GDP Was Similar in Israel and the Eurozone, around 3 percent, in 2013



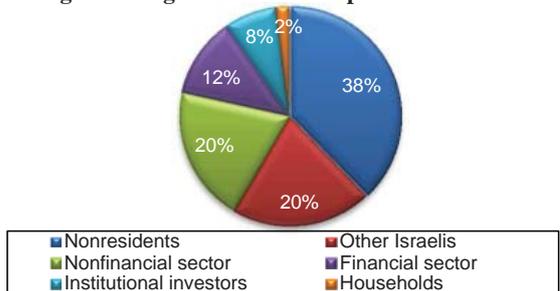
SOURCE: Based on BIS.

**Figure 3.11**  
Half of forex transactions<sup>a</sup> in 2014 were small—less than \$250,000



<sup>a</sup> Excluding swap transactions.

**Figure 3.12**  
Nonresidents' share of trading volume<sup>a</sup> in Israel's foreign exchange market was 40 percent in 2014



<sup>a</sup> Excluding swap transactions.  
SOURCE: Bank of Israel.

Main indicators in the foreign exchange market								
	Level <sup>a</sup>			Change				
	2012	2013	2014	2012	2013	2014		2015
						First half	Second half	First quarter
Shekel/dollar representative exchange rate	3.73	3.47	3.89	-2.3%	-7.0%	-1.0%	13.1%	2.3%
Shekel/euro exchange rate	4.92	4.78	4.73	-0.3%	-2.8%	-1.8%	0.7%	-9.5%
Dollar/euro exchange rate	1.32	1.38	1.22	2.0%	4.6%	-0.9%	-11.0%	-11.6%
Yen/dollar exchange rate	86.16	104.98	119.49	11.2%	21.8%	-3.5%	17.9%	0.4%
Nominal effective exchange rate (January 2, 2008 = 100)	91.57	84.59	87.19	-0.8%	-7.6%	-1.1%	4.3%	-3.4%
Average daily trading volume - conversions, swaps and OTC options (\$ million)	4,978	4,157	8,428	-23.8%	-16.5%	54.1%	31.6%	-12.8%
Nonresidents' share of trading volume <sup>b</sup>	41.0%	34.6%	31.6%	1.8	-6.4	-5.0	2.0	10.9
Nonresidents' foreign exchange purchases (\$ million)				-5,868	-914	-1,662	-175.7	2657.2
Foreign exchange purchases by the nonfinancial sector (\$ million)				6,181	4,431	2,102	-254.9	-2051.2
Foreign exchange purchases by institutional investors (\$ million)				1,921	-3,659	-1,003	1632.8	-1534.4
Actual volatility of the shekel/dollar exchange rate (moving 20-day average) <sup>b</sup>	5.5%	3.5%	9.3%	-0.1	-2.0	-0.1	5.9	-4.9
Implied volatility of shekel/forex OTC options <sup>b</sup>	9.4%	7.9%	9.4%	-1.8	-1.5	-1.9	3.4	1.4

<sup>a</sup> Level at the end of the period.

<sup>b</sup> Change in percentage points.

## D. THE CREDIT MARKET<sup>1</sup>

In 2014, there were net repayments of business sector<sup>2</sup> debt for the first time since 2009. However, outstanding debt increased by about 2.1 percent during the year, mainly due to the effect of the shekel's depreciation against the dollar on debt indexed and denominated in foreign currency.

The trend of previous years in the composition of debt by lenders<sup>3</sup>, by which the business sector's debt to banks is declining while debt to nonbank entities is increasing, continued. In particular, the increase in the volume of loans to the business sector from institutional investors continued.

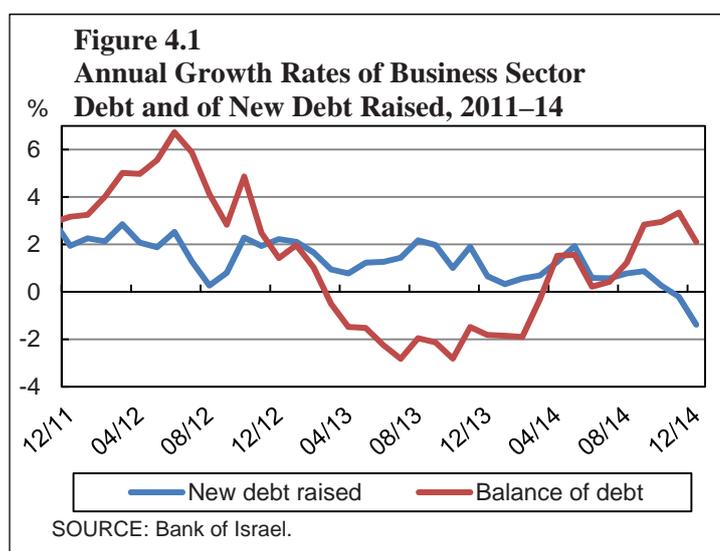
In 2014, the increase in outstanding household debt continued at a similar pace to that in 2013. Nonhousing debt increased at a greater pace than housing debt, in contrast to previous years. Nonhousing debt to institutional investors and to credit card companies continued to increase rapidly in 2014, but its overall balance remains low.

### 1. BUSINESS SECTOR DEBT

In 2014, there were net repayments of business sector debt, for the first time since 2009.

Net repayments in 2014 (negative net new debt raised) reached a pace of about 2 percent compared to the same period in the previous year, in contrast to net new debt raised of up to 2 percent per month in the previous two years.

Despite the repayments, total outstanding debt increased, to about NIS 815 billion at the end of the year, due to the effect of the shekel's depreciation against the dollar (about 12 percent) on the increase in debt indexed and denominated in foreign currency, which constitutes about 30 percent of debt.



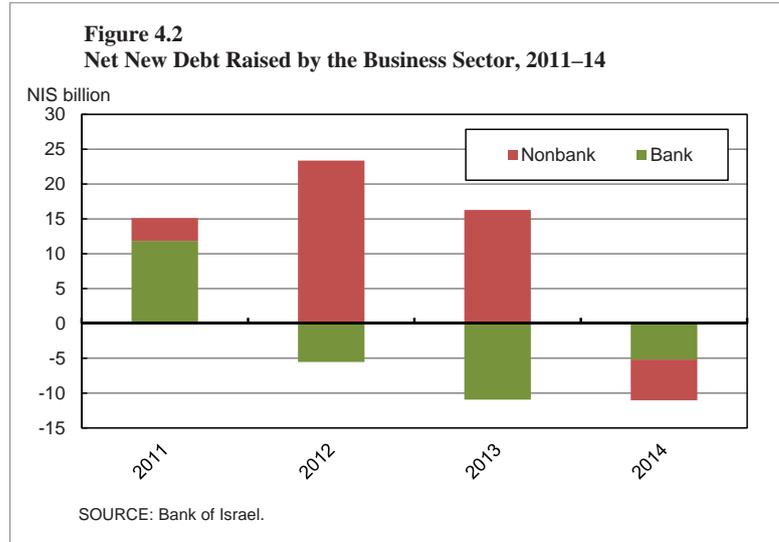
<sup>1</sup> The three main borrowing sectors in the economy are the nonfinancial business sector (excluding banks and insurance companies), households, and the government and local authorities (the public sector). This chapter concentrates on business sector and household debt.

<sup>2</sup> "Debt" relates to the borrowers' point of view, and its value is not dependent on market value or the value in the lenders' books. Outstanding bonds are presented in par value and adjusted ("accumulation" value) and outstanding debt to banks is presented before deducting doubtful debt allowances.

<sup>3</sup> The main sectors lending to corporations are the banks, institutional investors, nonresidents, and households (through the purchase of corporate bonds). The main sectors lending to households are the banks, institutional investors and credit card companies.

Net repayments of business sector debt were also recorded in nonbank debt in 2014, joining the net repayment of bank debt that began back in 2012.

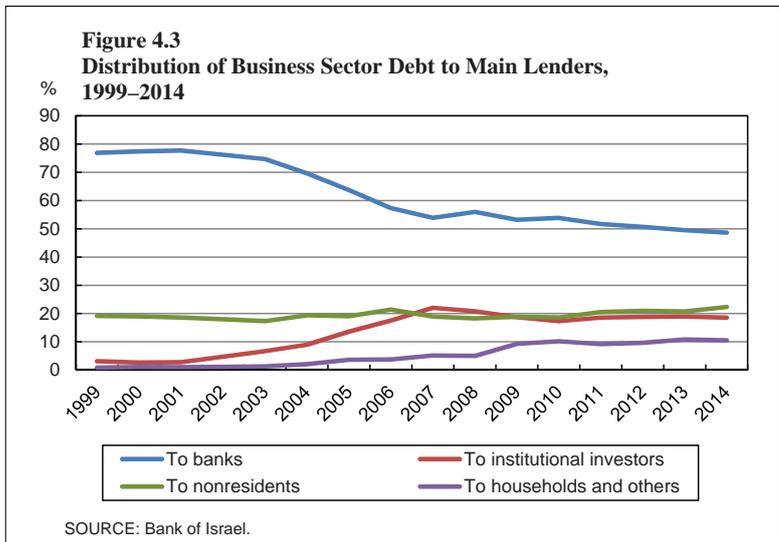
In 2012 and 2013, there was net new debt raised in the nonbank channel, totaling about NIS 40 billion, and net repayment of bank debt totaling about NIS 16 billion. In 2014, there were net repayments of about NIS 11 billion combined in the two channels.



The trend of recent years, by which the share of bank debt is declining in parallel with an increase in the share of debt to nonresidents, institutional investors and households, continued in 2014.

The decline of banks' share of total debt was rapid between 2003 and 2007 (a decline of 21 percentage points) and slower since then.

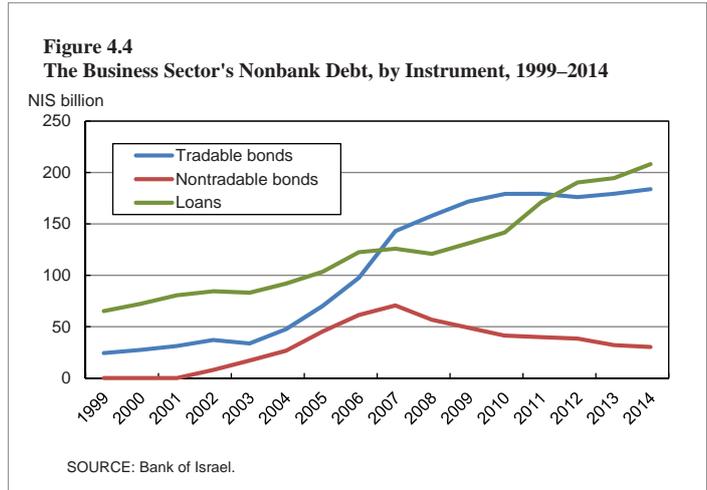
The proportion of debt to institutional lenders increased until 2007 and has remained virtually unchanged since then, at around 20 percent of total debt. Debt to households, which invest in business sector bonds, constitutes about 10 percent of total debt as of the end of 2014.



In nonbank debt, there has been an increase in the volume of loans and a decline in the volume of nontradable bonds in recent years.

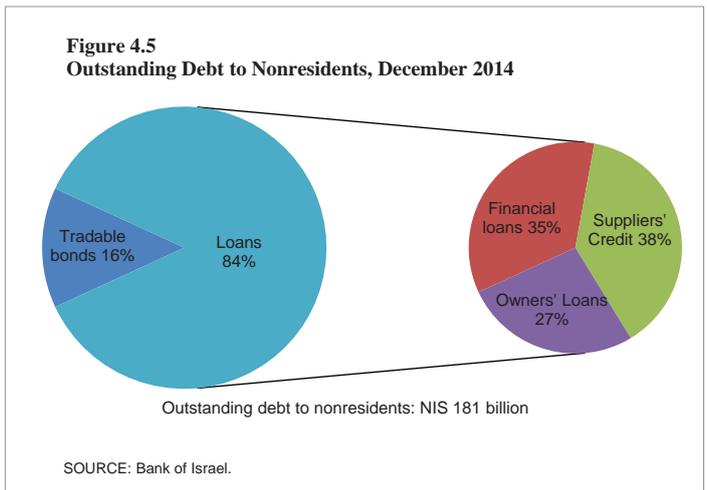
In 2014, loans constituted about 49 percent of total nonbank debt (about NIS 208 billion). Nontradable bonds accounted for about 7 percent.

The balance of tradable bonds remained virtually unchanged in recent years, totaling about NIS 184 billion (44 percent) in 2014.



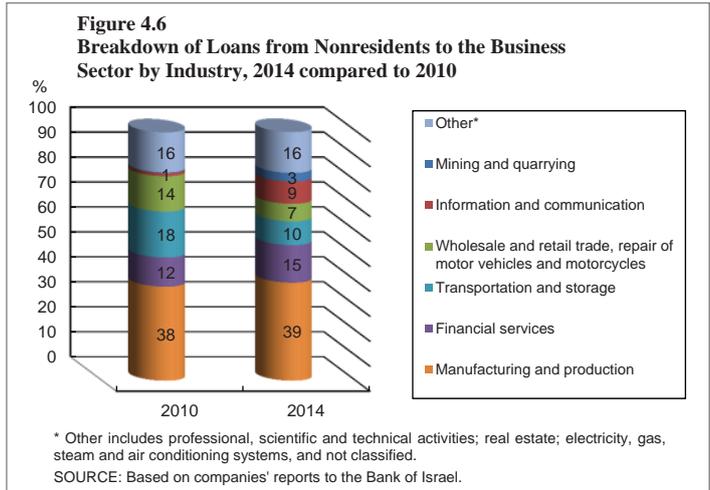
Business sector debt to nonresidents mainly reflects operational activity—credit to suppliers and owners’ loans.

Outstanding business sector debt to nonresidents totaled about NIS 181 billion in December 2014, an increase of 10 percent compared to the previous year. Loans constitute about 84 percent of this debt, while tradable debt accounts for just 16 percent.



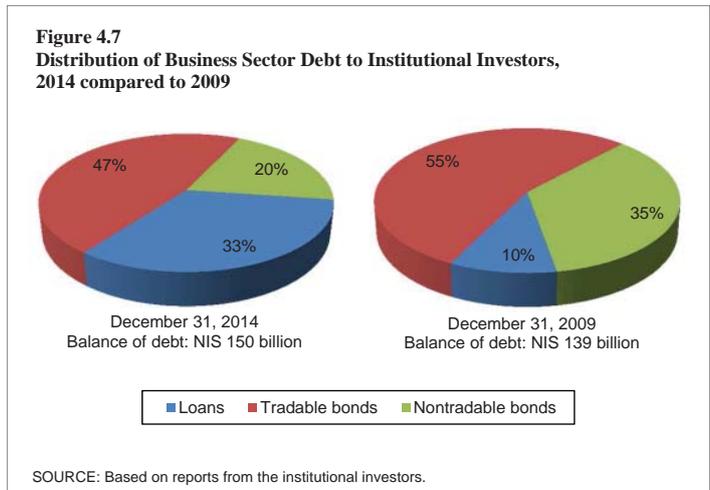
A significant portion of loans from nonresidents was provided to the manufacturing and production industry and to financial services.

In the past five years, an average of about 40 percent of loans was issued to companies in the manufacturing and production industry. The percentage of loans granted to companies in the financial services industry was around 14 percent on average. There was a significantly larger percentage of loans granted to the information and communications industry from nonresidents in recent years—about 9 percent in 2014, compared to about 1 percent in 2010.



In 2014, there was an increase in the granting of loans from institutional lenders to the business sector, and a decrease in the holdings of nontradable bonds.

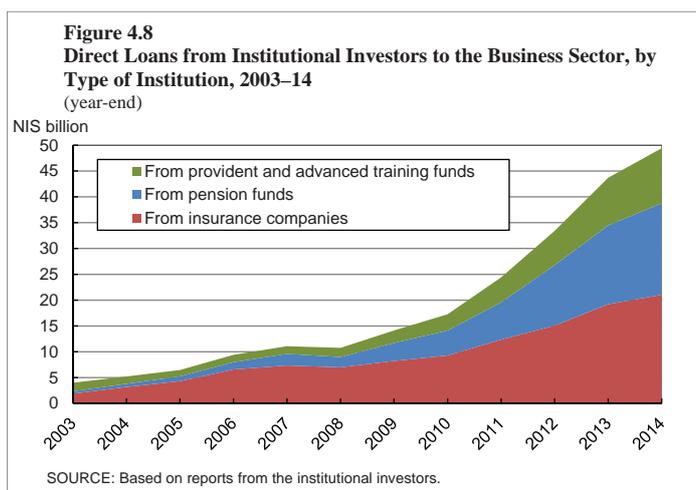
Outstanding debt to institutional lenders was about NIS 150 billion in December 2014, similar to the balance in the previous year. In recent years, there has been a prominent increase in the granting of loans directly to the business sector, in parallel with a decline in the rate of investments in corporate bonds, due to the Hodak Committee's limitations on institutional investments in corporate bonds.



Among the institutional lenders, the main lenders in the past decade have been insurance companies, although since 2009, there has been a marked increase in the growth of loans from pension, provident and advanced training funds.

In 2014, the increase in the granting of loans to the business sector from all types of institutional lenders continued (about 13 percent), with outstanding loans reaching a total of about NIS 49.4 billion.

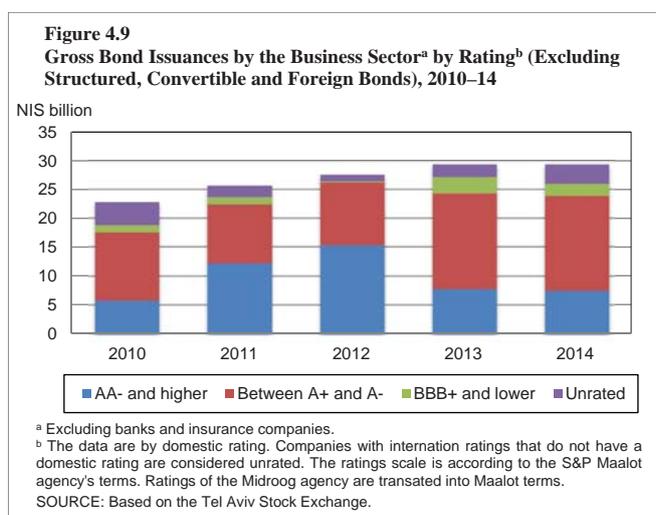
Loans taken out from the pension, provident and advanced training funds increased since 2009 at an average rate of about 40 percent, compared with an average rate of about 20 percent from insurance companies.



Alongside net repayments in the bond market, the business sector continues to issue debt through tradable and nontradable bonds, similar to the previous year.

In 2014, gross corporate bond issuances by the business sector totaled about NIS 30 billion, mostly through tradable bonds, similar to the amount in 2013.

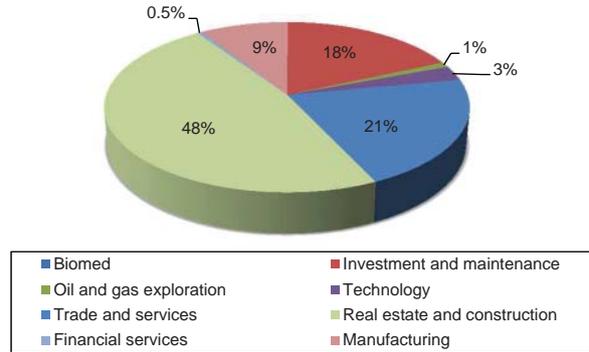
Bonds issued by real estate companies were prominent among bonds rated A- to A+, with about 30 percent of total issuances in 2014.



About half of the companies borrowing through tradable bonds in 2014 were from the real estate and construction industry.

Outstanding tradable bonds of the business sector in December 2014 totaled about NIS 153 billion, about 48 percent of which was from companies in the real estate and construction industry. The second-largest industry is the trade and services industry, which constitutes about 21 percent of outstanding tradable bonds. About 73 percent of outstanding tradable bonds are indexed to the CPI.

**Figure 4.10**  
Outstanding Tradable Bonds of the Business Sector, by Industry, December 2014



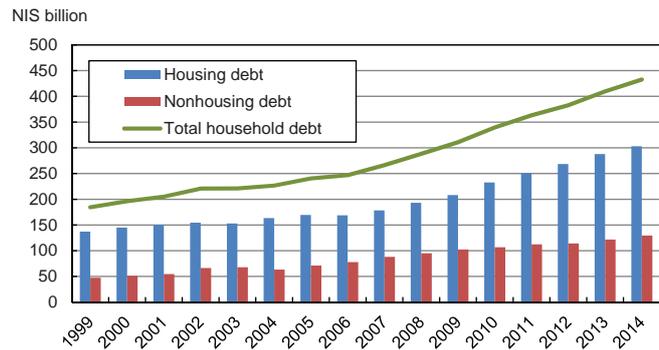
SOURCE: Bank of Israel.

## 2. HOUSEHOLD DEBT

The increase in household debt continued in 2014, in both housing and nonhousing debt.

During 2014, outstanding household debt increased by about NIS 23 billion, to about NIS 433 billion. This increase took place in both outstanding housing debt and in outstanding nonhousing debt. Housing debt has constituted about 70 percent of household debt since 2010.

**Figure 4.11**  
Household Debt, Housing and Nonhousing, 1999–2014

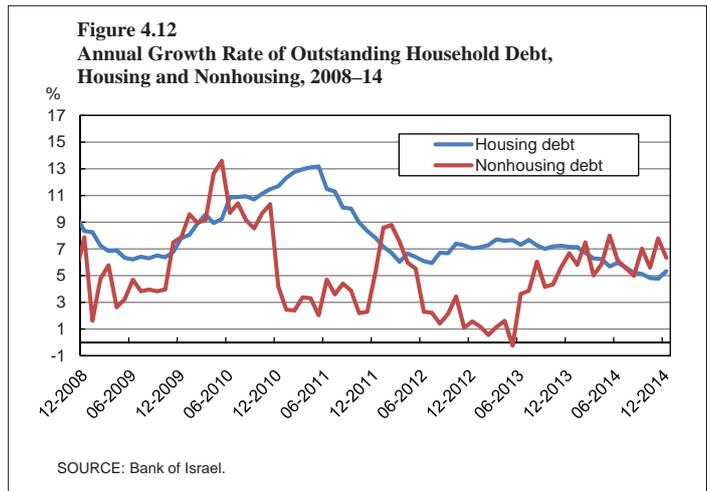


SOURCE: Bank of Israel.

In 2014, the increase in nonhousing debt was greater than the increase in housing debt, in contrast to the trend of previous years.

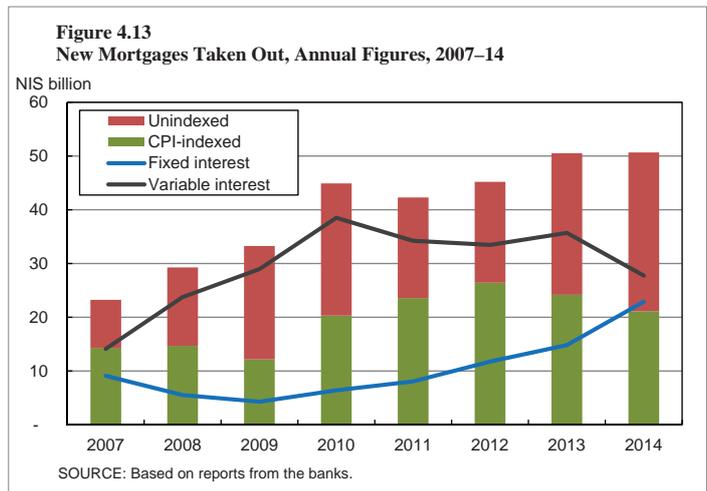
Outstanding housing debt increased in 2014 by about 5 percent, a slightly slower pace than in the three previous years, to about NIS 303 billion at the end of the year.

Outstanding nonhousing debt increased by about 6 percent since the beginning of 2014, to about NIS 129 billion at the end of the year.



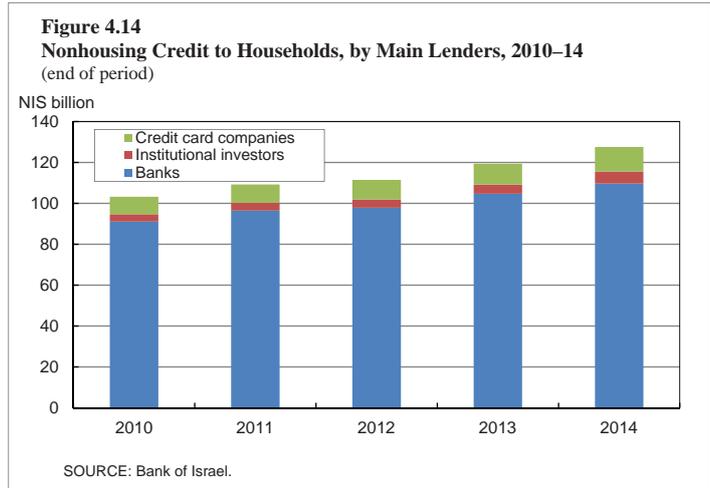
In 2014, the volume of new mortgages taken out from the banking system<sup>4</sup> was similar to that in 2013.

In 2014, the upward trend in the volume of new mortgages taken out was halted, following a continued increase between 2011 and 2013. The volume of new mortgages taken out from the banks totaled about NIS 52 billion. The portion of new mortgages at fixed interest increased, in parallel with a decline in the variable interest track, against the background of the limitations on the mix of loans put in place by the Supervisor of Banks.



<sup>4</sup> The volume of new mortgages taken out from nonbank entities is negligible.

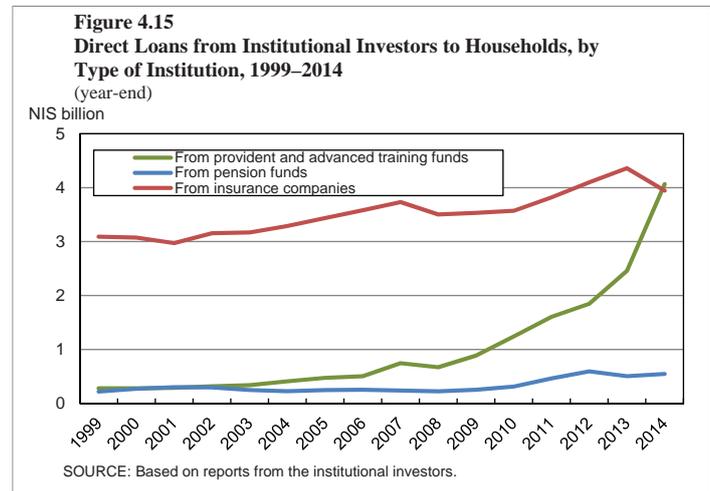
In 2014, nonhousing debt to all types of lenders continued to increase. There was an increase in the growth rate of nonhousing debt to institutional investors and to credit card companies. About 85 percent of household consumer debt is to the banks, with the remainder owed to credit card companies and institutional investors. In 2014, there was an increase in the growth rate of consumer debt to institutional investors and to insurance companies, but the total remains low.



In 2014, loans from provident and advanced training funds to households continued to increase, at a higher rate than in the past, but the total remains low.

Total household debt to institutional investors continued to increase in 2014, to about NIS 8.6 billion as of the end of the year.

Since 2008, the growth rate of loans from provident and advanced training funds has accelerated, and at the end of 2014, the total was about NIS 4 billion, similar to loans from insurance companies, where the volume declined in 2014 for the first time since 2008. Despite the increase in loans, the total remains low.



<b>Main indicators in the credit market (percent)</b>				
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Business sector debt</b>				
Outstanding debt (NIS billion, end of period)	802	813	799	815
Net new debt raised (NIS billion, yearly cumulative)	15	18	5	-11
Percentage of nonbank debt (end of period)	48.6%	49.7%	50.8%	51.8%
Percentage of tradable debt (end of period)	20.4%	20.1%	20.4%	18.8%
Business sector debt to business sector product ratio (end of period)	116%	110%	102%	101%
Effective cost of outstanding unindexed bank credit (December) <sup>a</sup>	5.92	5.23	4.19	3.59
Interest on indexed bank credit issued during the month, fixed interest for 5–10 years (December)	4.00	3.31	2.63	2.51
Yield on CPI-indexed tradable 5-year corporate bonds at fixed interest (December average)	5.26	3.31	2.20	1.88
Spread between CPI-indexed corporate bonds (Tel Bond 60) and 5-year government bonds (percentage points, December average)	2.95	1.66	1.28	1.84
<b>Household debt</b>				
Total household debt (NIS billion, end of period)	363	383	410	433
Percentage of housing debt (end of period)	69%	70%	70%	70%
Total new mortgages taken out (NIS billion, yearly cumulative)	44.72	46.64	51.71	51.51
Household debt to GDP ratio (end of period)	39.3%	38.6%	39.0%	39.8%
Average interest on mortgages - variable rate unindexed (December)	3.78	3.18	2.27	1.51
Average interest on mortgages - fixed rate unindexed (December)	5.3	4.49	4.17	3.25

<sup>a</sup> Until 2013, the figures were calculated based on net balances and related only to the 7 largest banks. From 2013 onward, the figures are calculated based on gross balances (before credit loss allowances) and relate to all banking corporations.

SOURCE: Reports from the banks and Bank of Israel data.

# Part Two



Papers on statistical methodology and economic data,  
and their implementation at the Bank of Israel:

1. Developments in the Economy's Basic Account over the Past Two Decades
2. Multi-Layer Outlier Detecting System (MODS)
3. Rapid Real Data in Israel, and an International Comparison

## Developments in the Economy's Basic Account over the Past Two Decades

Hadar Gotsman\* and Shelly Reiss\*

### Abstract

The basic account is an accepted aggregate for analyzing data about the economy's balance of payments. There are various definitions for the basic account, but according to the generally accepted definition it includes the current account surplus and net direct foreign investment (incoming investment minus outgoing investment). This paper presents data on the basic account in Israel according to its various definitions, and describes the developments and fluctuations in the basic account and its components over the past two decades.

According to the generally accepted definition, the basic account in Israel went, in 2004, from balance to surplus—a surplus that was maintained continuously through 2014. This switchover to surplus was linked to many structural changes that took place in the economy, headed by the consolidation of the high tech industry, which contributed to both the creation of a current account surplus and a significant increase in the flow of direct investments. The ongoing surplus in the basic account reflects the importing of structural capital into the economy. Looking ahead, the discovery of the natural gas reservoirs and the production of natural gas for both domestic needs and exports constitute a significant factor that will support the persistence of a basic account surplus.

\* The Information and Statistics Department, Bank of Israel

## A. Introduction

**The balance of payments in the economy** measures all the transactions between residents of Israel and nonresidents in foreign currency and in shekels. Transactions are usually classified in the balance of payments according to their type. For example, transactions involving imports and exports of goods and services are included in the current account, and transactions involving imports and exports of capital are included in the financial account. Within the financial account, a distinction is usually made between direct investments (investments by parties at interest in companies) and financial investments in marketable securities and other investments (deposits and credit).

In an analysis of the balance of payments data, among other things, consideration is given to an aggregate called the “basic account,” which includes the current account surplus and net foreign direct investment (FDI). The basic account makes it possible to identify the structural changes occurring in the economy over the years, and which are reflected in the balance of payments. Its components—direct investments and the current account—are more affected by long-term changes in the economy’s fundamental data, such as growth and competitiveness of the economy vis-à-vis abroad, and are less sensitive to short-term changes in economic parameters such as interest rate spreads, exchange rates, and share indices. These short-term changes have more effect on the other items in the balance of payments, such as financial investments and other investments.

The “structural” effect of the balance of payments on the foreign exchange market—the effect resulting from the fundamental factors in the economy—can also be derived from the basic account, i.e., the basic account can be used to determine whether there is a structural surplus in demand for foreign currency or a structural surplus in the supply of foreign currency. The surplus/deficit in the basic account reflects the direction and power of the surplus structural supply of/demand for foreign currency (the “basic pressure”) on the exchange rate.

The effect of the basic account aggregate on the exchange rate trend is also discussed in various international publications. For example, a 2011 article of the International Monetary Fund<sup>1</sup> examined the effect of the basic account, according to two different definitions, on the changes in the exchange rate of the euro and the Japanese yen against the dollar.

In the literature and in accepted practice, the definition of long-term capital flows to and from an economy is not always unambiguous, and is likely to differ from one economy to another, and sometimes even from one period to another.

Some of the definitions are broader, and also include long-term financial investments (providing that these can be measured). Other definitions are narrower, and bring into the aggregate only FDI inflows.

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<sup>1</sup> Robin Brooks, Hali Edison, Manmohan Kumar, and Torsten Slok, 2011, “Exchange Rates and Capital Flows,” IMF Working Paper, WP/01/90.

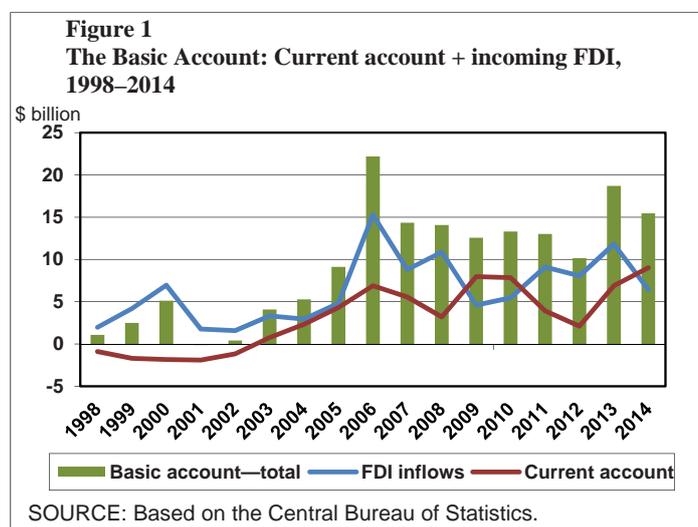
**In this paper**, the aggregate of the basic account—according to the various definitions—in Israel will be viewed, and the currently accepted definition—the current account surplus and net foreign direct investments in the economy—will be adopted, in order to describe the developments and fluctuations in the economy's basic account and its components over the past two decades (1998–2014). In addition, the basic account in Israel will be compared to the basic account in OECD countries, and in a group of developing economies.

## B. The Basic Account in Israel

### 1. Various Definitions of the Basic Account in Israel

**Three different definitions of the basic account can be applied in Israel:**

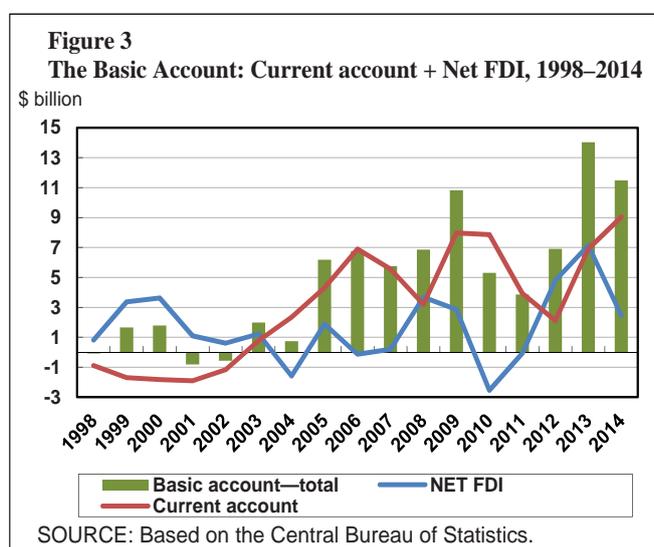
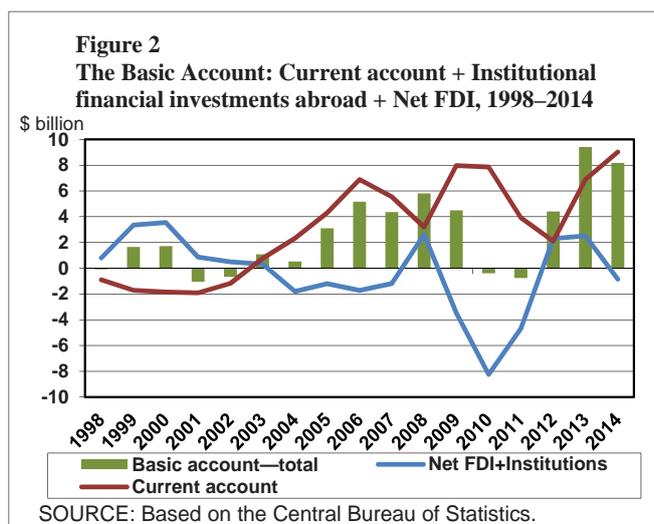
**The restrictive definition** of the basic account (Figure 1) adds to the current account surplus only the direct investment entering the economy (FDI). In a definition like this one, the basic account reflects **gross** imports of long-term capital into the economy, but does not take into account exports of structural capital from the economy, such as the economy's direct investments abroad. In this definition, the basic account surplus



has maintained a high annual level over the past decade (2005–14), averaging \$14.3 billion a year. **A more inclusive definition** (Figure 2) includes in the aggregate both direct investments abroad by the economy and financial investments abroad by institutional investors, who have invested abroad, since tax discrimination was eliminated in 2004, as part of a long-term risk dispersal strategy. This definition does not include financial investments of any kind in the economy by nonresidents. According to this definition, the basic account surplus is of course reduced, and even becomes negative in some years. Its average over the past decade was only \$4.4 billion. At the same time, it is interesting to see with that even by this definition, the basic account surplus has grown significantly over the past three years, mainly as a result of a significant rise in the current account surplus—in 2012–14, the annual basic account surplus averaged \$7.3 billion.

Henceforth in this paper, we have chosen to adopt an intermediate definition of the basic account (Figure 3), the most accepted, which adds the net foreign direct investments in the economy to the current account surplus. This definition takes into account only net imports of long-term capital resulting from direct investments in both directions. It does not include the financial investments abroad by institutional investors (or financial investments in the economy by foreign investors).

This definition adopts the distinction in the financial account between the two types of investments—direct and financial. It is based on the volume of exports of financial capital by institutional investors being affected by relatively short-term changes in share prices on overseas markets, and by changes in exchange rates and interest rates. In this definition, the basic account surplus over the past decade averaged \$7.8 billion per year.



## 2. Two Periods:

Two main periods can be distinguished in the economy's basic account during the period under review (1998–2014, Figure 3):

**The period of 1998–2004** featured a current account deficit and a low volume of net direct investment. The basic account surplus was accordingly negligible, and was even negative in some of these years. In contrast, in each of the last 10 years (**2005–14**), there was a substantial basic account surplus (about \$7.8 billion per year, 3.5 percent of average annual GDP): a combination of a current account surplus and a positive flow of net direct investment into the economy.

The transition from a relative balance in the basic account during the first period to surplus in the second period is linked to a series of significant processes that took place in the economy and the global economic environment:

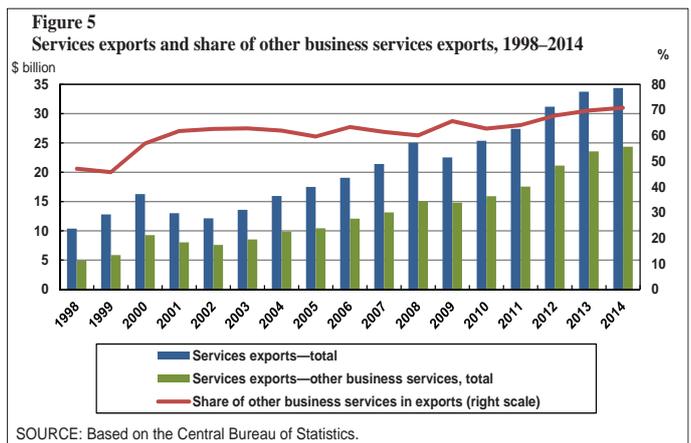
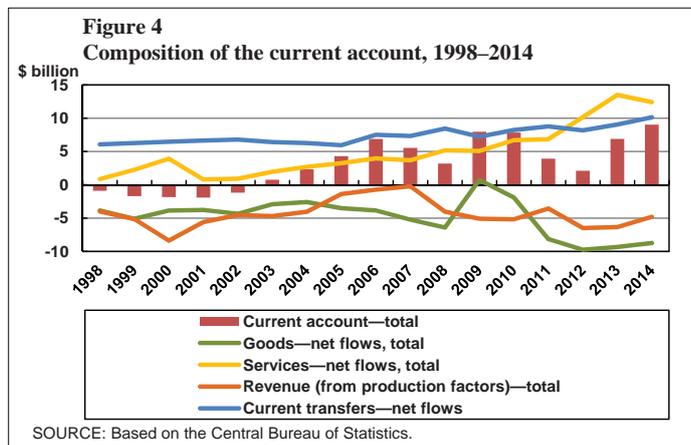
**In the economy**, Israeli industry underwent structural change that led to the emergence of the economy's relative advantages in high tech. A liberalization process in foreign currency and the financial account was completed, and there were geopolitical changes as well. These developments contributed to a marked improvement in the economy's fundamental data and its attractiveness vis-à-vis abroad.

**In the world**, financial and nonfinancial capital movements to emerging economies increased in the framework of an ongoing globalization process, combined with an expansion in world trade. The combined result of all these factors was increased capital movements to and from the economy. The developments in the energy sector in recent years—the discovery of natural gas reservoirs and the decline in fuel prices—led to further growth in the current account surplus. These are expected to have an even more significant effect on the current account in the coming years.

### 3. The Components of the Basic Account:

**The current account:** Until 2002, there was a current account deficit, which reflected a structural surplus of imports over exports in the goods account, net payments to factors of production, and a balanced services account. The ratio of the deficit to GDP increased during this period, reaching -1.5 percent in 2001, following the deflating of the high tech bubble.

Starting in 2003, the current account went into surplus, which then grew (not continuously), reaching a peak in 2014 (Figure 4). The transition to surplus occurred following a structural change in the economy's export industries and the emergence of the relative advantages of Israel companies in high tech (the proportion of total exports accounted for by the high tech sectors greatly increased). These developments, combined with growth in world trade, contributed to a reduction in the deficit in the goods account and to a substantial



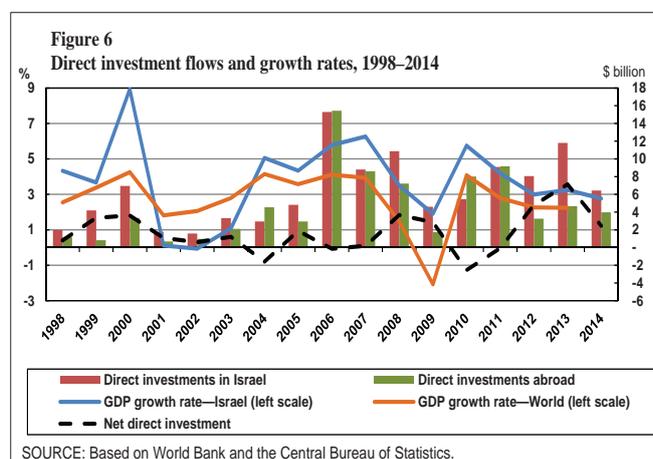
increase in services exports—business services exports (including software exports) constituted 47 percent of all exports of services in 1998, a proportion that increased to 70 percent by 2012 (Figure 5). Furthermore, in some of the years, the deficit in the income from production factors account declined markedly, mainly as a result of growth in income from direct and other investments and a decline in the payment of wages to foreign workers.

There has been further improvement in the current account in the past two years, stemming from the fall in global fuel prices and the discovery of the natural gas reserves in Israel. These developments have reduced the need for fuel imports, and in the coming years will also contribute to an increase in export proceeds resulting from exports of natural gas.

**Direct investments:** In an overview, up until 2005, gross flows of direct investments to and from the economy were at a relatively low level (except for the bubble year of 2000), and greatly increased in both directions from 2006 until 2014. Net flows of direct investment to the economy were positive during most of these years, with large fluctuations in their proportion of GDP.

At the end of the 1990s, development of the high tech sector in Israel made Israel much more attractive to investors. Direct investments by global companies in Israel in this period reached a peak in 2000 (about 5.3 percent of GDP), and continued until the high tech bubble deflated in 2001. Afterwards, given the economy's negligible growth, accompanied as well by a marked decline in global growth, the volume of direct investments in both directions fell steeply in 2001–02. Beginning in 2003, there was a recovery in the volume of direct investments in Israel, and since 2006, following the significant investment by Berkshire Hathaway in Israeli company Iscar, the flow of direct investment into the economy rose steeply to an annual average of \$8.9 billion, compared with a flow of outgoing investment averaging \$6.9 billion a year. The global crisis that began in 2008 caused only a temporary dip in investments in both directions in 2009, after which the net flow of investments into the economy grew.

Direct investments primarily feature deals of substantial size that are the culmination of long term processes. The investors are parties at interest in companies and retain their holdings for extended periods, and are not inclined to react quickly to short-term fluctuations in the share indices, interest rate spreads, or changes in exchange rates. In contrast, direct investments certainly do respond to significant changes in the business cycles and in domestic and global growth (Figure 6). In periods of decline in growth or global recession—for example, in 2001–02 following the deflating of the high tech bubble, and in 2008–09 during the financial crisis—the flow of direct investments in both directions wanes. The global companies experience liquidity difficulties that restrict their ability to invest, accompanied by tougher management of investments and a decline in their appetite for risk.



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## C. The Basic Account in an International Comparison

Basic account data for Israel were compared with two groups of countries: advanced economies, represented by OECD member countries, and developing countries.<sup>2</sup> From an international comparison of the ratio of the basic account surplus to an economy's GDP (Figure 7), it can be seen that over the years, Israel's basic account surplus has been similar to, and slightly lower than, that of the developing countries. At the same time, since 2012, the trend in Israel's basic account surplus, which amounted to 3.8 percent of GDP in 2014, has clearly been positive, compared with a downtrend in the developing countries (about 2.5 percent of GDP in 2013). Over the years, OECD countries have had an average basic account deficit amounting to approximately 1.5 percent of GDP. When the components of the basic account are compared to those of the two comparison groups, the following patterns stand out:

Over the years, Israel's **current account surplus** of about 1 percent is similar to, and highly correlated with, the group of developing countries.<sup>3</sup> At the same time, in the past two years, the trend of this ratio in Israel has been positive, reaching about 3 percent of GDP, contrasting with a downtrend in the average of the developing countries, reaching about 1.4 percent of GDP in 2013. A current account deficit has prevailed in the OECD countries since 2009, amounting to an average of about 0.4 percent of GDP – an improvement, in comparison with the years preceding the financial crisis, when the average current account deficit was about 1.3 percent of GDP (Figure 8).

**In recent years, the ratio of FDI inflows to GDP** in Israel has been similar to, and correlated with, the group of developing countries (an average of 3.2 percent, excluding 2006, an exceptional year<sup>4</sup>), and slightly higher than the average in the OECD countries, which has been about 1.9 percent in recent years (Figure 9).

**The ratio of FDI outflows to GDP in Israel** was similar to the ratio in both of the comparison groups (an average of about 2.1 percent, excluding 2006, Figure 10).

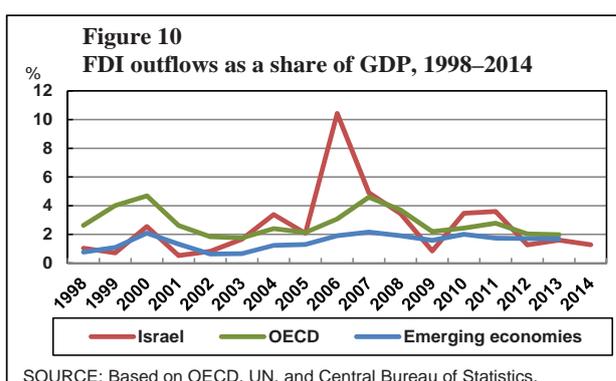
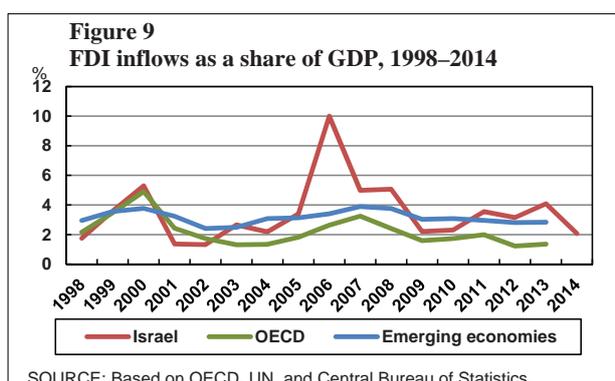
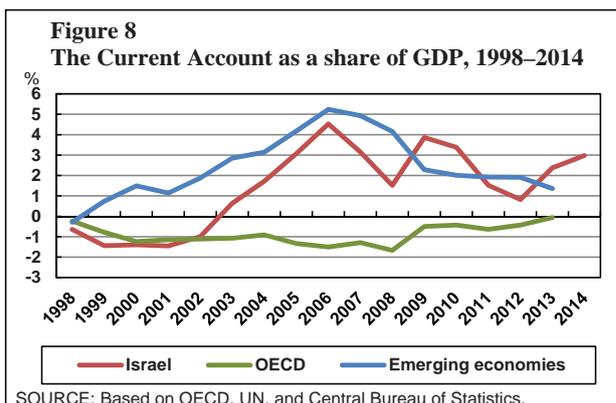
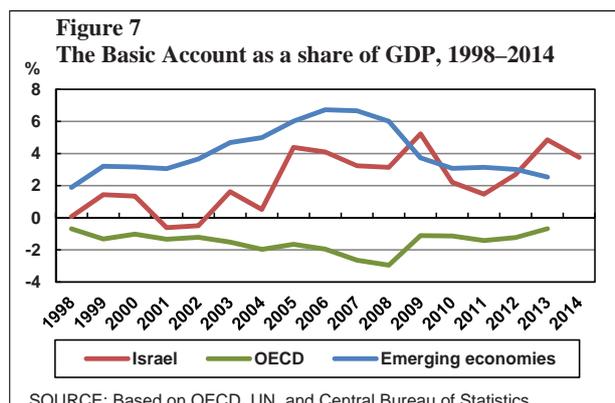
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<sup>2</sup> Sources of data and calculations: Based on OECD and the UN.

<sup>3</sup> In accordance with the UN definition.

<sup>4</sup> There was exceptional growth in direct investment in both directions in 2006, primarily as a result of two large-scale transactions (the investment of a foreign company in Iscar, an Israeli company, and an investment by Teva Pharmaceutical Industries, another Israeli company, in a foreign company).

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## D. Conclusion

The basic account is an accepted aggregate for analyzing data about the economy's balance of payments. According to its accepted definition, the basic account includes the current account surplus and net inflows and outflows of direct investments—elements that are more affected by long-term changes in the economy's fundamental data, and less by short-term financial considerations. The basic account in Israel went from balance to surplus in 2004, a surplus that was maintained continuously through 2014.

This transition to a surplus was related to many structural changes that occurred in the economy, headed by the consolidation of the high-tech industry, which contributed to both the creation of a current account surplus and a substantial increase in the flow of direct investment. We found that the level of direct investment inflows and outflows was linked to the business cycles in the economy, and to domestic and global growth. The ongoing basic account surplus was reflected in the imports of structural capital into the economy, which contributed to the appreciation of the shekel against other currencies.

The ratio of the basic account surplus to GDP in Israel is higher than the average in OECD countries, and is similar to the average in developing countries.

Looking ahead, natural gas—the discovery of the reservoirs and production of the natural gas for

domestic use and for export—constitutes a significant factor that will support the continuation of the basic account surplus, because it exerts an effect in the direction of both a current account surplus (more exports and fewer imports) and a rise in direct investments in the economy. The materialization of risks having a negative impact on domestic and/or global growth is liable to counter this trend.

## Multi-Layer Outlier Detecting System (MODS)

Ronen Fluss\* and Ben Z. Schreiber\*\*

### Abstract

The MODS system provides alerts of outlying developments in daily data series for the financial markets in Israel and abroad. An alert about the possibility of outlying developments in the financial markets constitutes an auxiliary tool for decision makers, including those responsible for financial stability and monetary policy. The system's uniqueness lies in the detection of outlier observations from various perspectives, and using diverse statistical procedures.

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\*\* The Information and Statistics Department, Bank of Israel, and Bar-Ilan University

## Introduction

The MODS system, developed at the Information and Statistics Department, was designed to provide alerts about outlying developments in daily data series of the financial markets in Israel and abroad. An alert about the possibility of outlying developments in the financial markets constitutes an auxiliary tool for decision makers, including those responsible for financial stability and monetary policy, in assessing the state of the market and making better informed decisions.

When the system detects an outlying event (reflected by an outlier value in observed data), it sends an alert, which triggers a process of clarifying the reason for the “outlierness” (defined herein as the existence or the extremity of an outlier) and a decision to take action, if it is decided that the reason for the outlying event requires this.

The MODS monitors 50 data series daily, from four financial markets: foreign exchange markets in Israel and worldwide, interest rate markets in Israel and worldwide, capital markets, and commodities markets.

Detection of outlying developments in the system takes place on a number of levels, with each level highlighting a different aspect of outlierness, as follows:

- First layer: Each data series is monitored separately to detect outlier values in it with respect to both its long-term and short-term probability distribution.
- Second layer: Classification of a development as an outlier takes place at the level of the entire market (stocks, bonds, etc.), even if each series by itself is not an outlier (as described for the first layer)—in other words, testing the combination of the relevant market data is likely to identify an event as an outlier.
- Third layer: Classification of a development as an outlier takes place when an outstanding deviation from a statistical connection between highly correlated variables is discovered. One example of a highly correlated data series is yields on short term bonds for various maturities up to 1 year.
- Fourth layer: Classification of a development as an outlier takes place when a deviation from a (longer term) economic relation between variables is discovered. For example, the relation of the interest rate spread between the shekel and the dollar and future expectations of the shekel-dollar exchange rate (based on the Uncovered Interest rate Parity – UIP).

Detecting outliers in the various layers makes it possible to assess, from an overall perspective and from various angles, the degree of outlierness in a specific data series, or the function of a specific market from various perspectives; this capability constitutes the system’s uniqueness.

The methodology of the MODS in detecting outliers in the first and second layers is described later in the review. Examples of the output of the MODS from these two layers, which are published

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daily on the Information and Statistics Department's portal at the Bank of Israel, are presented. In addition, a monthly summary of the outliers in the first layer will be presented.

### MODS 1 Detects Outliers—First Layer

In the first layer of the MODS, in which each series is monitored separately, a distinction is made between two types of outliers: (a) an outlier with respect to the long-term probability function, (b) an outlier with respect to the short-term probability function.

The objective: To detect outliers, both absolute and relative to their location; in other words, outliers both in terms of the long-term probability distribution and in comparison with the recent behavior of the series.

The degree of the outlier is presented in the following manner:

**Red** – an outlier with respect to both probability distributions

**Orange** – an outlier only with respect to the long-term probability distribution

**Yellow** – an outlier only with respect to the short-term probability distribution

**Green** – no outliers

The following is an example of an outlier in the “Changes in yields of 5-year unindexed government bonds” series that occurred on December 7, 2014. The following alert was sent about this outlier:



The MODS has detected an outlier in one or more of the data series on the home page of the Information and Statistics Portal. [Click here](#) for additional information.

Degree of outlierness	Last Date	Category
	05/12/2014	Foreign exchange
	07/12/2014	Inflation expectations
	07/12/2014	Yields, spreads and interest
	07/12/2014	Share indices
	05/12/2014	Commodity indices

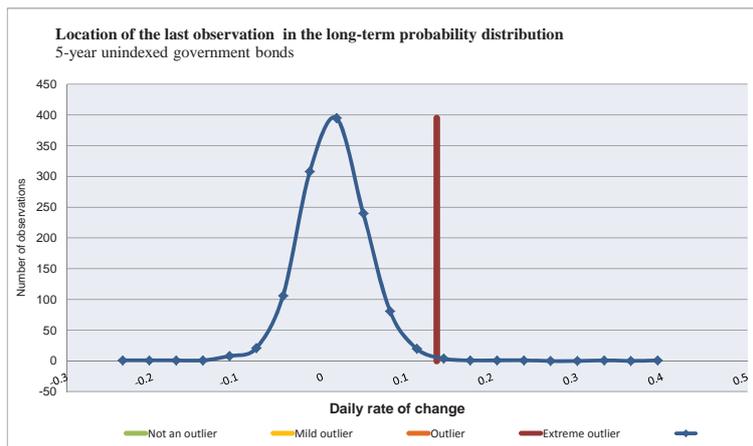
To select the series for which you will receive an e-mail alert, [click here](#).

After clicking on “Yields, spreads, and interest,” two screens are received describing two types of outliers:

## 1. Definition of an outlier in the long-term probability distribution

This aspect of outlierness determines whether the observation is an outlier with respect to the probability distribution based on the past five years. In order to obtain the “regular” long-term probability distribution, the most extreme observations (representing rare situations) were removed.<sup>1</sup>

The extreme observations are detected using the median absolute deviation (MAD)—a robust measure of the dispersion of outliers. For example, even if 30 percent of the observations are outliers, the MAD value will not be affected. In a normal probability distribution, the MAD value converges to the standard deviation. We set the default definition of an outlier as one found outside the upper 99.5 percentile and the lower 0.5 percentile of the long-term probability distribution (after removal of the extreme observations). In other words, an observation is considered an outlier if it outside the range of the 0.5 and 99.5 percentiles of the regular probability distribution. According to the example of outliers in the yield changes of government bonds, the system displays the location of the last observation with respect to the long-term probability distribution (a five-year histogram). It can be seen that the observation is an outlier from the perspective of the past five years.



<sup>1</sup> An extreme observation is an observation with a standard score ( $Z'$ ) higher than 4 (absolute value). Let  $X$  be the values in the original series. The standard score is defined as:

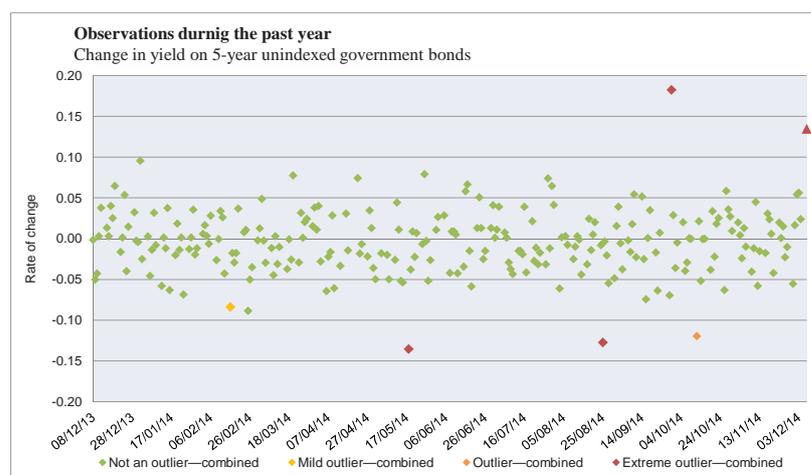
$$z' = \frac{x - \text{Median}(X)}{MAD_x}$$

$$MAD_x = 1.4286 \cdot \text{Median}(|X - \text{Median}(X)|)$$

where the medians in the formulas are calculated according to this long-term probability distribution.

## 2. Definition of outliers in the short-term probability distribution

This aspect of outlierness determines whether the observation is an outlier with respect to the probability distribution based on the past year. This probability distribution is defined for the standard score ( $Z'$ , see footnote 1), where the medians and MAD are calculated for the past 90 days for the purpose of detecting local changes in the variance. If an observation (after standardization) is found outside the upper 99.5 percentile and the lower 0.5 percentile in the short-term probability distribution (the past year) after extreme observations have been removed ( $Z' > 4$ ), it is defined as an outlier. According to the example of outliers in the yield changes of five-year unindexed government bonds, the system displays the observation of the last trading day, and all the observations during the past year.



### MODS 2 Detects Outliers—Second Layer

This measure checks market outlierness by examining the joint distribution of a number of variables representing the market. Outliers are checked with respect to the long-term distribution (daily data for the past five years after eliminating trend).

The objective is to issue an alert about outliers, with respect to the long-term distribution, which indicate a possibility of irregular behavior in the market being checked, where it is sometimes possible that even if each series in itself is not an outlier, the combination of the series may be uncommon.

This part of the MODS project is a continuation of the first layer, which dealt with outliers at the univariate level. The objective in detecting outliers in multivariate data is to detect an outlier market situation on the basis of a number of market characteristics obtained in the portal with daily frequency. At this stage, the foreign exchange and stock markets are being monitored. Each market is characterized by the following characteristics: (1) rate of change, (2) trading volume, (3) implied volatility (hereafter, IV, currently relevant only to the foreign exchange and stock markets)

or intraday spread (the spread between the high and low prices). The added value of detecting an outlier market situation, in comparison with detecting univariate outliers, as in the first part of the project is as follows:

- a. Multivariate analysis of the market situation makes it possible to detect situations in which each series is not an outlier in itself, but the combination is outlying.
- b. The series displayed in the portal usually include yield or price changes, but do not include risk and liquidity measures, such as trading volume, the spread between the high and low intraday price, and IV.
- c. The analysis makes it possible to detect special situations which do not differ from each other from a statistical perspective, but which are of great importance from an economic standpoint, particularly for policy managers. These cases include market failure, defined in this paper as a situation with low trading volumes, combined with a sharp change in prices and a high IV; and “waiting for an event,” defined as a situation in which IV is high, trading volumes are very low, and price changes are negligible.

The outlier character being searched for is global, not local, meaning that its detection is being sought with respect to the long-term distribution of the series, not with respect to the short-term distribution of that period. The outlierness with respect to the local distribution was sufficient at the level of the individual series, and was already examined at the (univariate) MODS stage.<sup>2</sup>

#### Definition of Outlierness

Outlierness is determined by the distance of each observation from the center of the joint probability distribution. This distance, called the Mahalanobis Distance (MHD), is calculated as follows:

Let  $X$  be the observation on a given day, representing a vector of a number of variables representing the market. For example, in the foreign exchange market,  $X$  can be the rate of change in the shekel-dollar exchange rate, the trading volume and the IV. The distance on day  $t$  is calculated by the following formula:

$$MHD_t = (X_t - M)' S^{-1} (X_t - M)$$

Where  $M$  is the vector of averages of the variables, and  $S$  is the matrix of covariances.  $M$  and  $S$  are estimated using the observations from the past five years. The Mahalanobis Distance reflects the distance of the daily observation from the average weighted by the covariances. In order to prevent the estimates of  $M$  and  $S$  being affected by outliers, the vector of medians was used to estimate  $M$ , and a robust estimate for  $S$  that takes into account only the central group of observations was used.

<sup>2</sup> At this stage, it is assumed that there is no serial correlation between the characteristics selected for the various markets, a correlation requiring a slightly different treatment than the methods selected. This assumption was tested for a selection of series, and was found to be reasonable.

The notation of the distance with the robust estimators is robust MHD. An observation is defined as an extreme outlier if its distance is outside the upper 99<sup>th</sup> percentile and a moderate outlier if its distance is between the 97.5<sup>th</sup> percentile and the 99<sup>th</sup> percentile. The outliers are classified as follows:

**Red**—an extreme outlier (above the 99<sup>th</sup> percentile)

**Orange**—a moderate outlier (above the 97.5<sup>th</sup> percentile)

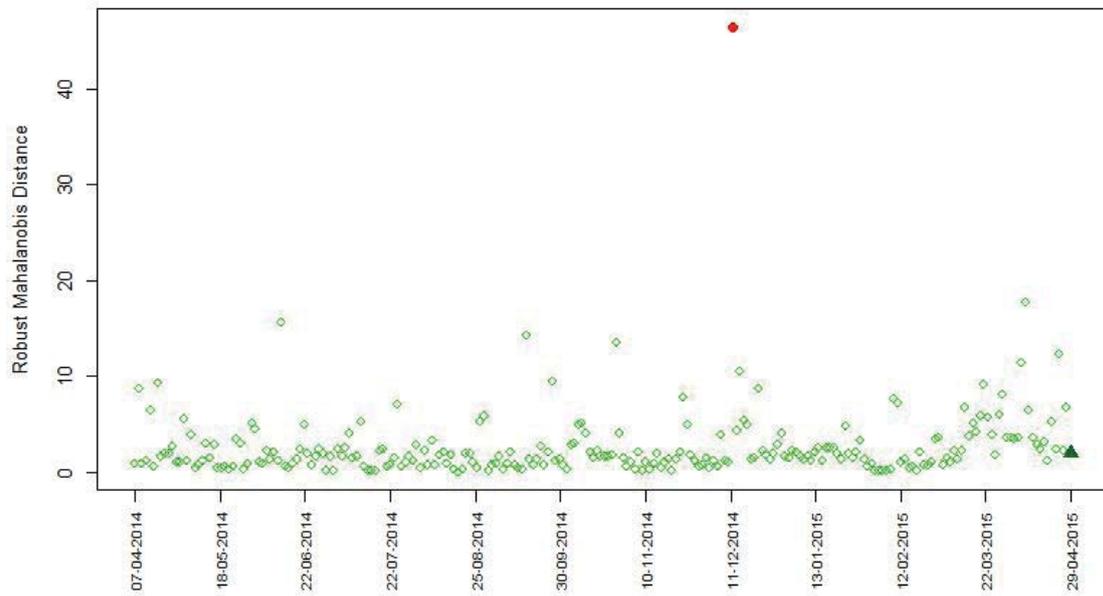
**Green**—not an outlier

### **The Graphic Representation**

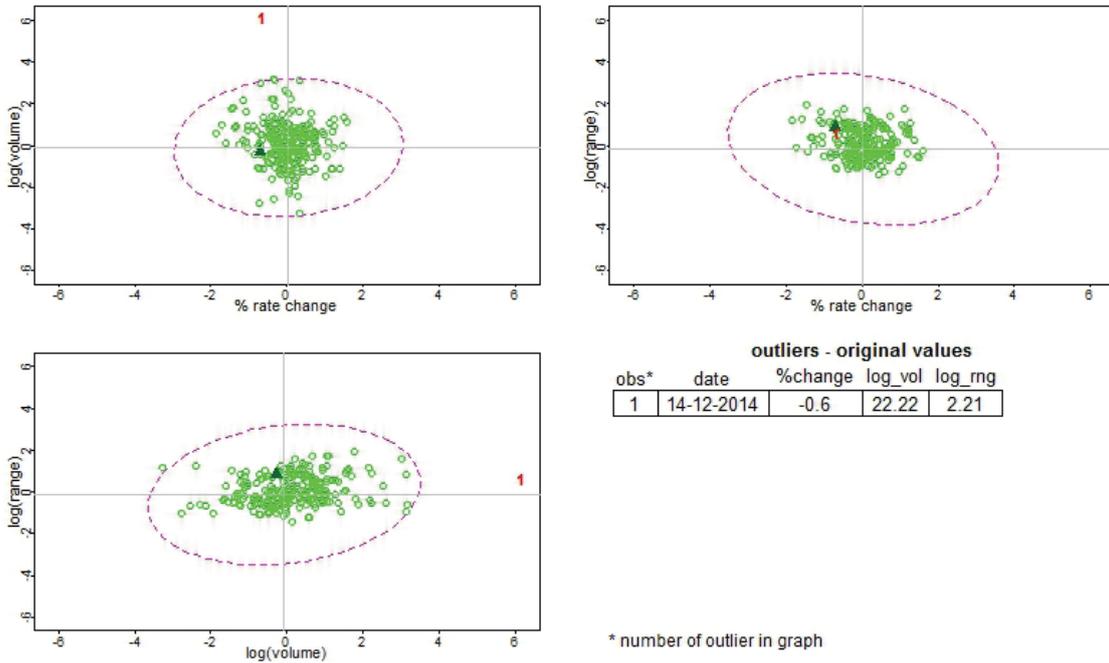
The first graph displays the robust Mahalanobis Distances of the stock market (represented by the Tel Aviv 100 Index) over the past year, with the level of outlierness noted according to the various colors (outliers are determined based on the past five years, not only the past year displayed in the graph). The distance of the current observation is marked with an enlarged triangle, whose color varies according to the market outlierness (red/orange/green).

The second graph displays the joint distribution of the three pairs of variables making up the market over the past year. This graph makes it possible to understand which of the variables have contributed to the market outliers on a given day. In each distribution, we mark the outliers, and number them according to the robust MHD (from the first graph); from the most extreme outlier to the least extreme. The original values of the outliers appear in the table below on the right. In addition, we sketch the ellipse representing the 97.5<sup>th</sup> percentile line in the bivariate normal distribution (based on the long-term distribution). This is only an approximation for the outliers limit, because a distribution of three variables, not two, is being used, and because the empirical distribution is liable to differ from the normal probability distribution. The current observation is also marked here with an enlarged triangle. The following is an example of the two graphs obtained for the stock market.

Robust Mahalanobis Distance

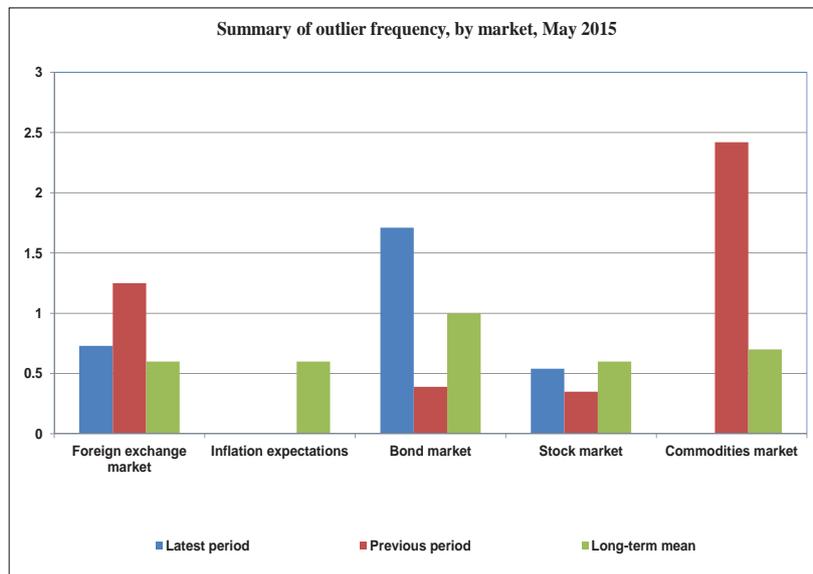


bivariate distribution of the variables in the last year (standardized)



In the outliers table, the outliers are sorted from highest to lowest, and three variables are displayed in it (with their original values) according to which the market outlieriness was determined.

One of the insights that can be deduced from the first layer in the MODS system is whether certain series or markets have been volatile recently, compared with the long-term distribution. For this purpose, the system creates a table and a graph summarizing the number of recent outliers (in the past 30 days), compared with the preceding period (the 30 days preceding them), and compared with the long-term probability distribution (the past five years—average and standard deviation) for all 50 examined series. According to these parameters, policy makers, analysts, and investors can assess whether the recent period was relatively “peaceful” or “tumultuous.” The following graph displays the average numbers of outliers in a series (domestic, global, and combined outlier) in each of the five markets being examined.



As indicated by the graph, in May 2015 there were 1.71 outliers in the bond market, on average for the series, compared with a long-term average of one outlier in each series. On the other hand, no outliers at all were detected in the commodities market in May, while the number of outliers in April averaged 2.4. These figures are consistent with the high volatility in global bond prices abroad and in Israel in May, and in oil prices in April.

## Rapid Real Data in Israel, and an International Comparison

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### Abstract

One of the key challenges of producing national statistics in any country is to provide information about real (non-financial) activity in the economy, in as close as possible to real time. Over the last decade, the Central Bureau of Statistics and the Bank of Israel have made a concerted effort to provide rapid real data about the economy. A study comparing Israel with several advanced economies found that the scope and availability of the rapid real data and indicators in Israel is similar to, and often better than, the world's most advanced economies. Nevertheless, in a few areas it was found that the rapid indicators and availability of the data could be improved.

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## A. Foreword

One of the key challenges of national statistics in any country is to provide information about real (non-financial) activity in the economy, in as close as possible to real time, particularly to bring economic policy in line with conditions in the economy as quickly as possible. This need becomes acute when attempting to identify turning points in business cycles, especially negative ones, close to their time of occurrence.

Key information about the real activity in any economy forms part of the data in the National Accounts. This information is not produced frequently—it is generally produced quarterly, and with a considerable delay—at least a month and a half after the end of the quarter. Consequently, the average time lag between the National Accounts data and the actual situation is about three months. This is due to the need to collect a broad range of data from a large number of entities that are unable to report frequently, and to complex, prolonged processing of the information, in accordance with international standards applied by the organization that generates the national statistics. In addition to the National Accounts data, there are great deals of other data on certain topics and areas of activity within the economy's real activity, some of which are produced more frequently, such as the Consumer Price Index, which is published monthly.

A direct way of addressing the challenge of the lack of real-time National Accounts data is to generate the actual National Accounts data more frequently—once a month. Very few countries—among them, Canada, Finland and Russia—generate a monthly estimate of economic output. Israel also investigated this possibility through collaboration between the Bank of Israel and the Central Bureau of Statistics (CBS) during the period 2012–13, but it became apparent that it could not be implemented at this stage due to the absence of a minimum range of monthly reports and data from key operators in the economy.

This challenge could also be addressed by producing various data and indicators about real activity in the economy more frequently—once a month, for example—as a way of indicating the state of the economy until the data in the National Accounts are published. Data of this kind are called “rapid data”.

The use of such rapid data is accepted all over the world and also in Israel, and it will be discussed at length in this paper. Years ago, many international organizations defined a series of standard indicators for all countries aimed at providing rapid estimates that correspond with key variables in the real activity sectors. For example, in 1996, the International Monetary Fund (IMF) prescribed a new standard, the Special Data Dissemination Standard (SDDS). The IMF also recommended developing Forward Looking Indicators in addition to the rapid data.

The recent global economic crisis once again raised the need to address the challenge of rapid real data. In the first half of 2009, in the shadow of the crisis, the UN organized a conference to discuss rapid real estimates.<sup>1</sup> At this conference, a list of basic indicators in the different sectors of real activity was formulated and the desired frequency of their publication was set.

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<sup>1</sup> Conference website: <http://unstats.un.org/unsd/nationalaccount/workshops/2009/ottawa/AC188-2.ASP>

In January 2014, the UN Economic Commission for Europe conducted a comprehensive international study to obtain a current picture of Rapid Indicators, Leading Indicators and Confidence Indicators that are used by different countries.

Over the last ten years, Israel, mainly at the Bank of Israel and CBS, has made a concerted effort to close key data gaps in real and financial data in general, and with respect to rapid data in particular.

This paper describes the current state of rapid real data in Israel, emphasizing the improvements that have been made in recent years. A comparison with the existing data in other developed countries will also be presented. The description and comparison relate to three categories of indicators that provide rapid real data: rapid indicators of current activity, leading indicators, and surveys, which are explained and demonstrated in the paper.

## **B. The different categories of rapid real data and the indicators in Israel**

### **1. Nowcasts: Rapid indicators of current activity**

**The purpose of rapid indicators of current activity—known as nowcasting—is to provide the best possible indication of real activity as it actually occurs, a sort of initial directional reading.**

Sometimes, the rapid data is part of more extensive cumulative data, and sometimes it is indicative of and corresponds with other data that is received later on.

The rapid data may be simple, raw data, such as foreign trade figures which provide a rapid indication of the balance of payments, or data derived from a statistical model in the case of a composite index, such as the Composite State of the Economy Index.

The rapid data are not a substitute for the National Accounts, and generally a broad range of rapid data from all areas of economic activity is examined to gain as reliable a picture as possible.

Sometimes, rapid data which is indicative of the overall level of economic activity is also important in its own right: for example, raw material imports are rapid data for GDP, but the figure is also important in itself as a component of the balance of payments.

Israel uses a large number of simple rapid data.<sup>2</sup> The key composite rapid data used in Israel is the Composite Index.

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<sup>2</sup> For example: building starts and mortgage data; the Industrial Production Index and the import of fuel; trade and services revenue, retail sales and durable goods imports; the import of commodities in general, and of raw materials imports in particular, services exports (added in 2009), tourist arrivals; VAT receipts and health tax receipts.

## 2. Leading Indicators

**The purpose of Leading Indicators in the real (non-financial) sector is to highlight turning points in economic activity that are expected to occur within several months. A leading indicator is generally a series that, over time, correlates and is consistent with a target variable, mostly real output.**

There are two main groups of leading indicators: (1) Simple Leading Indicators, such as the number of job vacancies in the economy, durable-goods orders and the number of building permits, which are widespread in many countries. (2) Composite Leading Indicators (CLIs), in which a statistical model is used to integrate several rapid data to create a single indicator. The predictive power of the different indices varies from one country to another and from one period to another. For example, the predictive power of building permits may be limited because they depend on administrative decisions that do not always coincide with market conditions and the timing of these changes.

During the 1980s, the OECD began to compute Leading Indicators for most of its member countries, including Israel after it joined the organization in 2010. The method used to create this indicator does not reflect a structural economic model but refers mainly to the lead time of simple rapid data. The indicator was formulated to help identify future turning points in business cycles and it is based on monthly series from the real, monetary and financial sectors, all of which are capable of providing early signals of turning points in economic activity.

Israel also uses several Leading Indicators, for example: the number of job vacancies in the labor market, durable goods orders, and the import of inputs for the consumer goods and industrial manufacturing sectors. Regarding Composite Indicators, the Bank of Israel's Information and Statistics Department examined the Leading Indicator that the OECD calculates for Israel, and several adjustments were made in the series that comprise it with the purpose of improving the ability to pinpoint the turning points and the lead.<sup>3</sup> Furthermore, the Markov Switching Model was used to create a composite leading indicator which is based on the existing forward relationship between turning points in the stock market and turning points in the Industrial Production Index.<sup>4</sup>

## 3. Surveys

**In this context, a survey is a poll designed to reflect assessments regarding the state of recent economic activity and to provide a forecast of groups in the population, and which may have macroeconomic repercussions for overall economic activity.**

Most of the surveys consist of two parts: the first includes questions relating to assessments about the present and the second relates to the respondents' assessments regarding the future. These polls can therefore be used as the basis for Nowcasting indicators and leading indicators. The most prominent surveys in Israel in the real sector are the Central Bureau of Statistics Business Tendency Survey (which was added in 2010), the Companies Survey (conducted by the Bank of Israel), and the Consumer Confidence Index (compiled by several organizations).

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<sup>3</sup> Gharrah (2012).

<sup>4</sup> Mansura and Schreiber (2012).

The Companies Survey has been issued by the Bank of Israel's Research Department every quarter since 1983 and it examines seven components of real economic activity among different companies: manufacturing, construction, transport and communications, hotels, trade and services.

In principle, this is a qualitative poll that incorporates companies' assessments of present levels of activity and forward-looking information. The survey also includes questions about the companies' constraints with respect to financing, manpower and equipment. The net balance of the survey reflects the companies' levels of optimism or pessimism about economic activity in the economy in the present and in the coming months.

## C. Israel compared to selected countries

### 1. Nowcasts

A comparison of the scope and content of Israel's simple and composite Nowcast indicators (Tables 1 and 2) with those of several major advanced economies—the US, Germany, UK, Canada and Australia—shows that most of the indicators currently used in those countries are available in Israel as well. The differences lie mainly in the sources of the information and methods of calculation. For example, the US publishes, toward the end of every month, a monthly quantitative Construction Spending index, which is obtained from a survey of building contractors on progress made in construction projects over the last month, in monetary terms. In contrast, the Bank of Israel Companies Survey and the Central Bureau of Statistics Business Tendency Survey only provide a qualitative response from contractors regarding the companies' output in the current month (increased/decreased/no change).

Another example of the differences found is that of the financial robustness of the economic units in the different economies. Monthly data on applications filed for bankruptcy by individuals and businesses are readily available in the countries in the comparison group (except for the UK, where the data are quarterly). In contrast, this information is not available in Israel, and financial robustness is examined through other data available to the Banking Supervision Department, such as information about restricted customers and accounts.

#### **Availability of the indicators**

We also compared the availability of the nowcast indicators, namely, how close they are to real time: the review shows that the level of availability of data on foreign trade and private consumption is higher in Israel than other parts of the world, but lower than the comparison countries for data on the housing market and the Industrial Production index. There is a one-month difference between Israel and the US in publication of the Industrial Production index (in the US it is published three weeks after the end of the month, and in Israel, about 7 weeks). This is a significant gap, both due to the high correlation of the index to output, and to the fact that the Industrial Production index is a key input in computing composite rapid indicators such as the Composite State of the Economy Index.

Notwithstanding the foregoing, a comparison of the availability of rapid data in Israel with other leading global economies such as Germany, the UK, Canada and Australia, shows that the US is actually a positive exception to the rule, and that Israel compares favorably with the other countries in the comparison group.

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**Table 1**  
**List of key (simple) Nowcast indicators of real activity in Israel and the world**

Israel	US	Germany	UK	Canada	Australia
<b>Housing market data</b>					
1 Building starts	Housing Starts	Housing Starts	New House Building	Housing Starts	
2 Number of new home transactions	Home Sales (new, existing and pend.)	Home Sales Index	New Home Sales	New Home Sales	Australia New Home sales
3 Execution of construction work in the field	Construction Spending	Construction Output	Construction Output		
4 Mortgages granted	MBA Mortgage Applications	Mortgage Index	Mortgage Approvals	Mortgage Approvals	Housing Finance by Purpose
5 Balance of mortgages more than 90 days in arrears	MBA Foreclosure Applications				
<b>Business sector data</b>					
6 Industrial Production Index	Industrial Production Index	Industrial Production Index	Index of Production	Month. Survey of Manuf.	Austr. Ind. Prod. Index
7 Machinery and equipment utilization rate	Capacity Utilization	Capacity Utilization	Capacity Utilization	Capacity Utilization	NAB Capacity Utilization Pct.
8 Business customers restricted, number of business account restricted, number of business checks returned and their financial value	Commercial Bankruptcies	Commercial Bankruptcies	Commercial Bankruptcies	Commercial Bankruptcies	Aust. Com. Bankruptcies
9 Fuel imports	Crude Oil Weekly Stocks	Crude Oil Stocks	Crude oil Production	Crude Oil Production	Crude Oil Production
<b>Households and private consumption</b>					
10 Trade and services revenue; chain store sales, retail sales	Retail Sales	Retail Sales	Retail Sales	Retail Trade	Retail Sales
11 Durable goods imports	.Durables Sales (Ex Transport)	Retail Sales of Durables	Retail Sales	Retail Sales by Type of Commodities	.Retail Trade by Ind
12 Car Sales	Total Vehicle Sales	Car Sales	Car Sales	Retail Sales by Type of Commodities	Sales of New Motor Vehicles
13 Consumer credit card purchases	Consumer Credit	Consumer Credit	Consumer Credit	Consumer Credit	Consumer Credit
14 Consumer confidence surveys	Personal Income	Personal Income	Personal Income	Disposable Personal Income	Personal Income
15 Private customers restricted, number of personal accounts restricted, number of private checks returned and their financial value	Non Com. Bankruptcies	Non Com. Bankruptcies	Non Com. Bankruptcies	Non Com. Bankruptcies	Non Com. Bankruptcies
<b>Foreign trade data</b>					
16 Trade Balance	Trade Balance	Trade Balance	Balance of Trade	Trade Balance	Trade Balance
17 Raw Materials Imports	Industrial Supplies & Materials Imports	Raw Materials Imports	Raw Materials Imports	Raw Materials Imports	Raw Materials Imports
18 Goods Exports	Goods Exports	Goods Exports	Goods Exports	Goods Exports	Goods Exports
19 Services Exports	Services Exports	Services Exports	Services Exports	Services Exports	Services Exports
20 Tourist Arrivals	Tourist Arrivals	Tourist Arrivals	Tourist Arrivals	Tourist Arrivals	Tourist Arrivals
<b>Public sector data</b>					
21 Monthly estimate of budget performance	Monthly Budget Statement	Government Spending	Government Spending	Government Spending	Australian Gov't Spending
22 Health tax receipts	Indiv. Income and Empl. Taxes		Social Sec. Contr.		
23 VAT receipts	VAT Cash Received		VAT on Production		

**Table 2**  
**List of key (composite) Nowcast indicators of real activity in Israel and the world**

Israel	US	Germany	UK	Canada	Australia
The Composite State of the Economy Index	The Philadelphia Composite Index of Coincident Indicators, The US Chicago Fed Nat. Activity Index, Empire Manufacturing, The Conference Board Coincident Economic Index, the e-Forecasting Monthly GDP	The Conference Board Coincident Economic Index	The Conference Board Coincident Economic Index	The Conference Board Coincident Economic Index, monthly GDP	The Conference Board Coincident Economic Index
Nowcast for GDP-two versions: Bottom-up and Top-down	Federal Reserve Bank Nowcast for the GDP	The EUROSTAT Flash Indicator for GDP Growth	The EUROSTAT Flash Indicator for GDP growth	The Flash Indicator for GDP Growth	The Flash Indicator for GDP Growth
Nowcast for GDP components	Federal Reserve Bank Nowcast for the GDP Components	The EUROSTAT Flash Indicator for GDP Components Change	The EUROSTAT Flash Indicator for GDP Components Change	The Flash Indicator for GDP Components Growth	The Flash Indicator for GDP Components Growth

**Table 3**  
**Availability of simple rapid data—Israel and the US; number of weeks**  
**between the end of the month and publication date of the data**

	Israel		US	
<b>Housing market data</b>				
1	Building starts	8	3	Housing Starts
2	Number of new home transactions	5	4	Home Sales (new, existing and pend.)
3	Execution of construction work in the fielda	1.5	4	Construction Spending
4	Mortgages granted	2	0.5	MBA Mortgage Applications
5	Balance of mortgages more than 90 days in arrears	5	0.5	MBA Foreclosure Applications
<b>Business sector data</b>				
6	Industrial Production Index	7	3	Industrial Production Index
7	Machinery and equipment utilization rate	1.5	3	Capacity Utilization
8	Business customers restricted, number of business account restricted, number of business checks returned and their financial value	4	4	Commercial Bankruptcies
9	Fuel imports	2	0.5	Crude Oil Weekly Stocks
<b>Households and private consumption</b>				
10	Trade and services revenue; chain store sales, retail sales	3,7	2	Retail Sales
11	Durable goods imports	2	4	Durables Sales (Exc. Transport)
12	Car Sales	2	1	Total Vehicle Sales
13	Consumer credit card purchases	4	5	Consumer Credit
14	Consumer confidence surveysb	1.5	5	Personal Income
15	Private customers restricted, number of personal accounts restricted, number of private checks returned and their financial value	4	4	Non Com. Bankruptcies
<b>Foreign trade data</b>				
16	Trade Balance	2	5	Trade Balance
17	Raw Materials Imports	2	5	Industrial Supplies and Materials Imp.
18	Goods Exports	2	5	Goods Exports
19	Services Exports	7	5	Services Exports
20	Tourist Arrivals	1.5	5	Tourist Arrivals
<b>Public sector data</b>				
21	Monthly estimate of budget performance	2	2	Monthly Budget Statement
22	Health tax receipts	5	Daily	Indiv. Income and Empl. Taxes
23	VAT receipts	5	Daily	VAT Cash Received

## 2. Leading Indicators for forecasting future economic activity

The international comparison shows that with respect to Leading Indicators, all the countries use essentially the same simple and composite indicators as an indication of the anticipated level of economic activity (Table 4).

Most of the OECD member countries, including Israel, use the leading indicator calculated for their country by the OECD as their Leading Indicator, and other leading indicators are included in this measure. Another composite leading indicator which is widely used around the world, but not in Israel, is The Conference Board Leading Index, which is prepared by a private US entity for major countries around the world.

**Table 4**

### List of simple and composite leading indicators for forecasting economic activity in Israel and the world

	Israel	US	Germany	UK	Canada	Australia
<b>Simple</b>						
1	Job vacancies	Job Openings	Job Vacancies	Job Vacancies		ANZ Job Vacancies
2	Vehicle orders	Durable Goods Orders Non-Vehicle	Car Registrations	Car Registrations	Car Registrations	Vehicle Sales
3	Durable-goods orders	Durable Goods Orders	Factory Orders	New Orders	New Orders	New Orders
3	Building Permits	Building Permits	Building Permits	Building Permits	Building Permits	Building Approvals
5	Business inventories	Wholesale and Business Inventories	IFO Current Assessment	Change in Inventories	Change in Inventories	Change in Inventories
6	Capital goods imports	Cap. Goods Imports	Cap. Goods Imports	Cap. Goods Imports	.Cap. Goods Imp	.Cap. Goods Imp
7	Credit to the business sector	Loans to Private Sector	Loans to Private Sector	Loans to Private Sector	Loans to Private Sector	Loans to Private Sector
<b>Composite</b>						
8	OECD Leading Indicator, iOECD and iMSM	OECD Leading indicator	OECD Leading indicator	OECD Leading indicator	OECD Leading Indicator	OECD Leading Indicator and the Westpac Leading Index
9	Index based on Google searches	The Conference Board Leading Economic Index; The e-Forecasting Leading Economic Indicator	The Conference Board Leading Economic Index	The Conference Board Leading Economic Index	The Conference Board Leading Economic Index	The Conference Board Leading Economic Index
10	Bank of Israel Research Department staff forecast	Bloomberg Leading Index and the Philadelphia Fed Leading Index			Statistics Canada Composite Index (discontinued)	GDP Growth Rate Forecast

### 3. Surveys

In Israel as well as in all the comparison countries, several surveys are conducted concurrently by different entities (Table 5): the Business Tendency Survey, the Companies Survey, and consumer confidence surveys.

In the comparison countries, the large number of surveys conducted by private research entities is notable. In Israel, the Central Bureau of Statistics and Bank of Israel prepare business tendency surveys. Consumer confidence surveys are conducted concurrently by the Central Bureau of Statistics and Bank Hapoalim.

**Table 5**  
**List of surveys (business tendency and consumer confidence)**  
**used in Israel and the world**

Israel	US	Germany	UK	Canada	Australia
<b>Business tendency surveys</b>					
1. Business Tendency Survey by the Central Bureau of Statistics, Bank of Israel's Climate Index, Bank of Israel's Companies Survey, Purchasing Managers Index	Dallas Fed Manf. Activity, Chicago Fed Nat Activity Index, ISM Composite, Manufacturing and Services, US Manufacturing and US Services PMI, Chicago Purchasing Manager and Bloomberg Economic Expectations, NFIB Small Business Optimism, Chicago PMI, US Redbook Index	ZEW Survey Expectations, IFO Business Confidence Index, ZEW Survey Current Situation, BME Germany Composite and Manfct. & Services PMI, Expectations and Current Assessment, GfK Consumer Confidence, Germany Composite, Services, Construction, Retail and Services PMI	ZEW Survey Expectations and ZEW Survey Current Situation, CBI Business Optimism index, UK Manufacturing and Services PMI, CBI Small Business Optimism Index	The Richard Ivey School of Business Canada Business Confidence Index (The Ivey PMI Index), Manufacturing PMI	NAB Business Confidence Index, Australia Man. PMI, Australia Serv. PMI, NAB Small Business Optimism Index
<b>Consumer confidence indices</b>					
2. Consumer Confidence Indices compiled by Globes, the Central Bureau of Statistics, and Bank Hapoalim	Univ. of Michigan Consumer Confidence Index, US IBD/TIPP Economic Personal Optimism Index	German GfK Consumer Confidence	UK GfK Consumer Confidence	Canada Consumer Confidence	Westpac Consumer Confidence Index

## D. Summary

One of the key challenges of national statistics in any country is to provide information about real (non-financial) activity in the economy in close to real time. In Israel and other parts of the world, the accepted way of meeting this challenge is to produce rapid real data. Rapid real data is various information and indicators of real activity on a monthly basis, the purpose of which is to provide indications on the state of the economy until the National Accounts are published. Three categories of indicators provide rapid data about real activity and they are differentiated by their purpose and underlying methodologies: rapid indicators, leading indicators and surveys.

Over the last decade, the Central Bureau of Statistics and the Bank of Israel have made a concerted effort to provide rapid real data about the economy. Examples are: a shift from quarterly to monthly Labor Force Surveys; the issue of services exports data; an information system on the housing market set up by the Bank of Israel; the development of business sector climate indices and leading indicators to monitor changes in real activity; publication of the Central Bureau of Statistics monthly Business Tendency Survey, in addition to the Bank of Israel's quarterly Companies Survey.

A study comparing Israel with several advanced economies found that the scope of the rapid real data and indices in Israel is similar to, and at times better than, the world's most advanced economies, with respect to the scope and availability of the indices. Nevertheless, in a few areas it was found that the rapid indicators and availability of the data could be improved, for example by switching to quantitative rather than qualitative data. Moreover, the delay in producing some of the indicators could be reduced, particularly with respect to the housing market and the Industrial Production Index, for example, by issuing the Industrial Production Index within three weeks, as in the US, instead of within seven weeks.

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Websites of Israel's Central Bureau of Statistics, various central banks, and other official government institutions worldwide.

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