



Bank of Israel

Market Operations Department

Investment of the
Foreign Exchange
Reserves

Annual Report 2009

CONTENTS

MAIN DEVELOPMENTS	3
A. THE LEVEL OF THE RESERVES AND THEIR MANAGEMENT FRAMEWORK	5
1. The management framework	5
2. The level of the reserves	5
B. RESULTS OF INVESTING THE RESERVES IN 2009	11
1. The holding-period rate of return and the benchmark risk	12
2. The contribution and the risk of the active management	15
3. The yield on the dollar portfolio relative to other managed portfolios	21
BOX - THE GLOBAL CRISIS—MANAGING CREDIT RISKS AND THE OPERATIONAL RISK IN THE MARKET OPERATIONS DEPARTMENT	24

TABLES

Table 1 – The Level of the Reserves Relative to Other Aggregates, 2000-2009.....	9
Table 2 – The Performance of the Actual Portfolio vis-à-vis the Benchmark Portfolio, 2000-2009	11
Table 3 – The Contribution of Asset Selection to the Excess Return on the Reserves Portfolio, 2007-2009	19

FIGURES

Figure 1 – Foreign Exchange Reserves, 2000-2009 (Monthly averages)	6
Figure 2 – Changes in the Foreign Exchange Reserves in Various Groups of Countries Worldwide and in Israel, 2001-2009	8
Figure 3 – Level of Reserves at the End of 2009 Relative to Various Aggregates, Israel Compared With Other Countries (In percentages)	10
Figure 4 - The Yield and the Total Management Contribution, 2000-2009 (Percent, in numeraire annual terms)	13
Figure 5 – Yields to Maturity of American Treasury Bonds and Government Bonds in Europe, 2007-2009 (percentages).....	14
Figure 6 – Volatility of the Active Management (Tracking Error), 2007-2009 (Moving year, basis points)	16
Figure 7 – The Ratio of the Excess Rate of Return to Its Standard Deviation (Tracking Error), 1999-2009	17
Figure 8 – The Yield and the Total Management Contribution, January-December 2009 (Percent, in monthly terms)	17
Figure 9 – Asset Distribution of the Reserves, 2009 (Annual average, percentages) ...	18
Figure 10 – The Three-month TED Spread and the Average Spread of Eurobond Assets in the Reserves, 2007-2009	20
Figure 11 – Performance Distribution of Managers of Mutual Funds in the US Market, 2000-2009 (Percentages, in annual terms)	22
Figure 12 – Yield and Risk: the Dollar Portfolio vis-à-vis Funds in the US Market, 2000-2009 (Percentages, in annual terms)	23
Figure 13 – Distribution of Exposure to Banks and to Governments, 2000-2009	25

MAIN DEVELOPMENTS¹

- The Bank of Israel's foreign exchange reserves grew by about \$17 billion in 2009, and at the end of 2009 stood at \$59.1 billion. The growth in reserves this year, as in 2008, was mainly the result of purchases of foreign currency by the Bank of Israel that started at the end of the first quarter of 2008 as part of a program to increase the Bank's foreign exchange reserves, and of the new policy adopted by the Bank in the foreign currency market in August 2009.
- The latest crisis emphasized the importance of holding an appropriate level of foreign exchange reserves as an essential source of liquidity at times of crisis. Many other countries also increased their foreign exchange reserves this year. The increase in the level of Israel's foreign exchange reserves in the last two years strengthens the economy and its financial resilience, and improves Israel's international financial standing.
- The change was evident also in the significant increase in the ratio of the reserves to various financial aggregates of the Israeli economy. Thus, for example, the average level of the reserves in 2009 covered Israel's entire short-term external debt, reaching 126 percent of the debt, compared with 80 percent in previous years, and they are more than one quarter of the annual GDP.
- As part of the Bank of Israel's reserves management policy, the reserves are invested in conservative assets, but even prior to the outbreak of the global crisis in September 2008, and also during 2009, the Bank took additional measures to reduce the exposure of the reserves to the burgeoning financial risks: banking exposure was reduced almost to zero, investment rules were tightened, additional restrictions were imposed on the exposure to various countries and the assets in which the reserves can be invested, and further requirements were added to ensure a proper level of liquidity in various currencies.
- The holding-period rate of return on the reserves in terms of the numeraire was 1.9 percent in 2009, compared with 4.3 percent on average in the years 2000–2009. This rate of return was affected to a large extent by the extremely low interest rates and yields to maturity in the bonds market of the US government and other governments worldwide, levels that persisted throughout 2009 due to the global crisis that erupted at the end of 2008. The holding period rate of return in shekel terms was higher, 3.6 percent..
- The contribution of active management in 2009 was exceptionally high, and totaled 110 basis points, compared with a positive average contribution of 19 basis points in the past decade. The high excess return this year was affected mostly by the long-term spread assets in the portfolio, which benefited from significant narrowing of the spreads in yields to maturity between them and those on

¹ The Market Operations Department has been reporting to the public on the investment of the reserves since 2000. The reports for previous years, some of which have been published as chapters in the Bank of Israel's reports, can be found on the Bank of Israel's website www.bankisrael.org.il. Explanations and definitions of terms used in the current report appear in the previous reports, which also discuss various aspects of managing foreign exchange reserves that are not discussed in this report.

government bonds. A prominent component among the spread assets this year were bonds and commercial paper issued by banks from the end of 2008 and backed by full government guarantees as part of the unconventional intervention methods adopted by governments and central banks around the world to support the financial system and stabilize the markets.

A. THE LEVEL OF THE RESERVES AND THEIR MANAGEMENT FRAMEWORK

1. The management framework

The management of Israel's foreign exchange reserves is subject to the **Bank of Israel Law, 5714-1954** and its accumulated legal interpretations. These define how the Bank may conduct its foreign-currency activities and limit the types of assets in which it may invest. In areas in which the Bank is not restricted by the wording of the Law, it acts within a framework that reflects the spirit of the Law and the Bank's priorities, and limits the various risks to which the reserves are exposed. The main financial risks are credit risk, controlled by a system of rules and quotas; interest-rate risk, controlled mainly by setting a target average duration for each currency portfolio; and currency risk, controlled by defining a neutral currency composition—the numeraire—that serves also as a yardstick for measuring the performance of the portfolio. Other risks, such as operational and legal risks, are also taken into account.

2. The level of the reserves

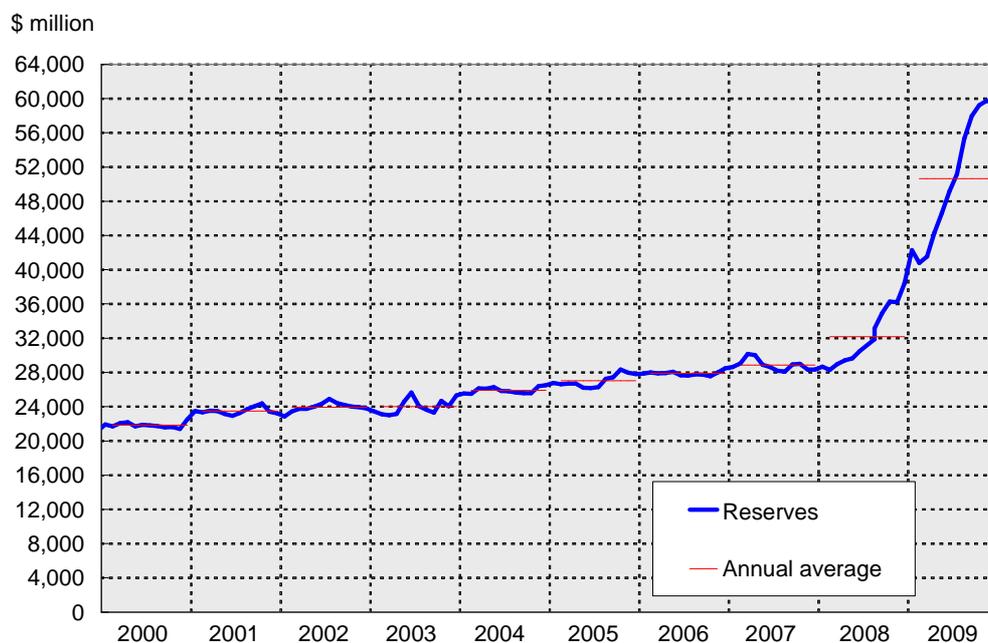
Israel's foreign exchange reserves grew this year in dollar terms by \$16.8 billion, from \$42.3 billion at the end of 2008, to \$59.1 billion at the end of 2009.² The substantial increase in reserves, similar to the previous year, was mainly the result of the purchase of foreign currency by the Bank of Israel as part of the program set in motion in March 2008, and the Bank's subsequent activity in the foreign exchange market, starting in August 2009. This year the Bank purchased in the shekel-foreign currency market \$19.6 billion, in continuation of the purchase of \$12.1 billion in 2008. The changes in the level of the reserves this year were also the result of other factors: on the one hand, the current income from managing the reserves (interest, capital gains, and exchange-rate differences against the dollar) contributed a growth of \$2 billion, while on the other, the withdrawals of the private sector (the local banks) of \$4.6

² The level of reserves throughout this survey does not include allocations of drawing rights by the International Monetary Fund to member countries (SDRs allocation), or the reserve tranche, which at the end of 2009 reached \$1.5 billion. See also The Bank of Israel: Financial Report for 2009.

billion³ and of the government of \$0.2 billion acted to reduce the reserves, and partially set off the increase in the level of reserves.

The reserves serve as a source of liquidity to be used as and when necessary, and their purpose is also to yield benefits that derive from the very fact that the country is holding them—reducing the probability of a crisis in the Israeli foreign-exchange market and enhancing the country’s standing in the international financial environment. The definition of the roles of the foreign exchange reserves is derived both from the benefit that could accrue from them, as well as their possible uses for the needs of the economy. These uses are: servicing the country's debts; financing imports in crises; using the reserves for managing the Bank of Israel's policy regarding the stability of the banking system and the foreign exchange market; and using them as a tool for implementing monetary policy. The method of managing the foreign exchange reserves, their currency composition (the numeraire) and their desired level are determined according to policy rules that are derived from the functions of the reserves.

Figure 1 – Foreign Exchange Reserves, 2000-2009
(Monthly averages)



³ These are withdrawals of foreign exchange deposits of the local banks in the Bank of Israel, which were deposited at the end of 2008 against the background of the deepening of the crisis, and were withdrawn at the beginning of 2009.

At the beginning of 2008, following an assessment of the desirable level of reserves, the Bank of Israel decided that in light of the needs of the economy, against the background of the rapid GDP growth in recent years, and the economy's growing integration in the world economy and the global financial system, Israel's foreign-currency reserves should be increased.⁴ Therefore, from the end of March 2008, the Bank of Israel began to implement a plan to increase the level of reserves by purchasing foreign currency in the course of trading. The desirable level of reserves was determined as being between \$40 and \$44 billion. When this aim was achieved, in the course of 2009, the Bank of Israel continued the purchasing plan in order to assist the Israeli economy to continue to deal with the ramifications of the global crisis and with the economic uncertainty that still prevailed worldwide. In August 2009, the Bank of Israel announced that the purchasing plan would cease,⁵ and that henceforth the Bank would operate in the foreign exchange market only in cases of exceptional fluctuations in the exchange rate of the shekel that were incompatible with the basic conditions of the economy, and in cases in which the foreign exchange market was not functioning properly.

An examination of the change in Israel's foreign exchange reserves in the past decade shows that while the growth in the reserves occurred almost wholly during the past two years—113 percent, the cumulative rate of growth over the decade is similar to that of OECD countries, and even less than the rate of growth of the overall reserves in all countries in this decade (Figure 2). In the past two years the level of foreign exchange reserves has grown at higher rates in most OECD countries as well. For example, in 2008 and 2009, the euro-bloc countries increased their foreign exchange reserves by 32 percent, the Scandinavian countries by 38 percent, Switzerland by 121 percent, Australia by 60 percent, and Canada by 30 percent.

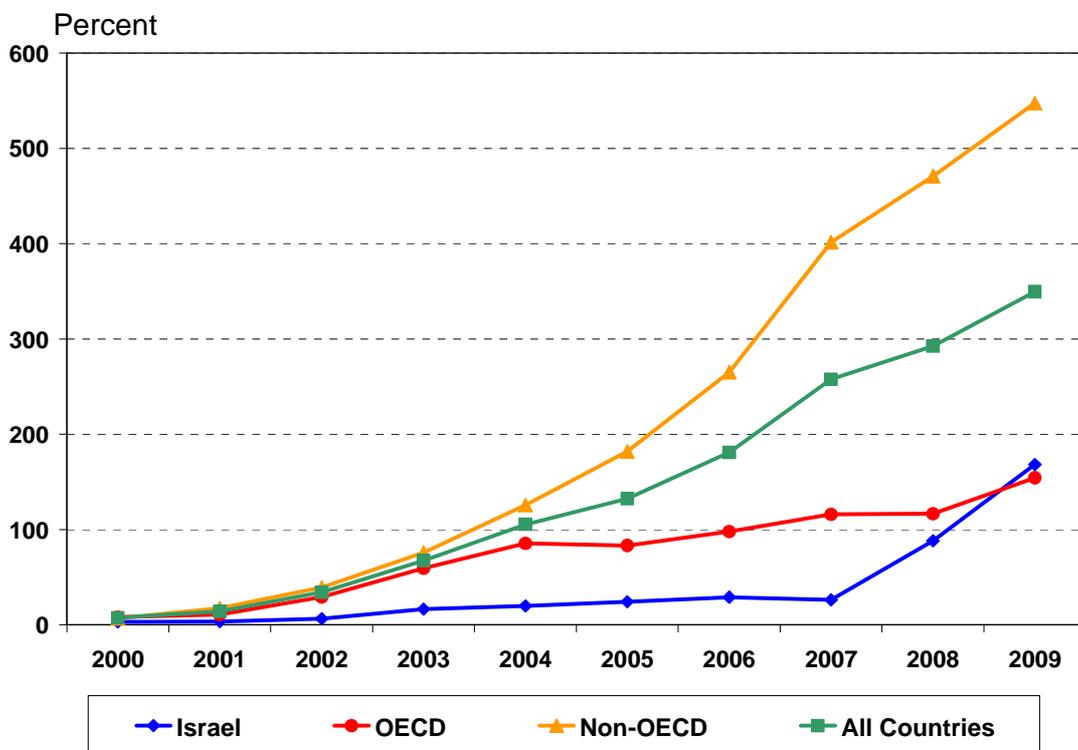
In the wake of the crisis, new ideas are emerging worldwide about what constitutes the holding of an appropriate level of foreign exchange reserves, and their desirable ratio to various financial aggregates. One of the lessons of the crisis is that the holding of a large amount of foreign exchange reserves is particularly important for the financial

⁴ This assessment was based mainly on the appropriate level of reserves that might be required in various circumstances, including times of crisis.

⁵ The purchasing plan commenced at the end of March 2008, and initially included the daily purchase of \$25 million in the foreign exchange market. In July 2008, the plan was expanded to the daily purchase of \$100 million, and was only stopped in August 2009 with the change in policy regarding the foreign exchange market.

resilience of the economy, and confers an advantage in times of crisis when liquidity in the markets runs out. This recognition is compatible with the considerable growth recorded in 2009, similar to that of Israel, in the foreign exchange reserves of OECD countries and other countries worldwide. It should be mentioned that despite the sharp rise in Israel's level of reserves in the past two years, their management framework has not changed until now, and the Bank of Israel will continue to examine this issue from time to time.

Figure 2 – Changes in the Foreign Exchange Reserves in Various Groups of Countries Worldwide and in Israel, 2001-2009



The purchases of foreign currency, which was spread over the whole year, led also to significant growth, \$18.4 billion, in the average level of reserves—from \$32.2 billion in 2008 to \$50.6 billion in 2009 (Figure 1). **At the same time the change in the ratio of the average reserves to economic aggregates with which they are customarily compared improved considerably this year, reaching record levels in comparison with previous years** (Table 1):

- The average ratio of the reserves to GDP rose above 25 percent in 2009, as against a decrease in previous years to only 16 percent in 2008. In December 2009, the reserves already constituted more than 30 percent of GDP.

- The average ratio of the reserves to imports more than doubled, to more than eight months, as against four months in 2008, and in December 2009, the level of the reserves covered almost ten months of imports.
- The average reserves in 2009 already covered more than the whole short-term debt of the economy—126 percent as opposed to 82 percent in 2008—and they constituted more than 50 percent of the gross external debt. Also the ratio of the average reserves to the unindexed local-currency assets held by the public (M2) rose in 2009 to almost 50 percent, as against 33 percent in 2008.

Table 1
The Level of the Reserves Relative to Other Aggregates, 1999-2009

	Average level of reserves (\$ million)	Imports (months)	Gross external debt	Short-term external debt	Unindexed local-currency assets (M2)	Gross domestic product
	<i>Reserves as percent of aggregate</i>					
1999	21,569	5.4	33	78	55	19
2000	21,843	4.5	32	72	46	18
2001	23,495	5.4	35	79	43	19
2002	23,948	5.8	34	76	48	21
2003	23,999	5.5	32	80	46	20
2004	25,908	5.2	33	82	47	20
2005	27,020	5.0	35	82	46	20
2006	27,884	4.7	32	75	45	19
2007	28,865	4.1	32	73	37	17
2008	32,189	4.0	37	82	33	16
2009	50,645	8.3	56	126	48	26
Dec-09	59,475	9.7	65	147	57	31

SOURCE: Bank of Israel, The Central Bureau of Statistics, and returns from the banks.

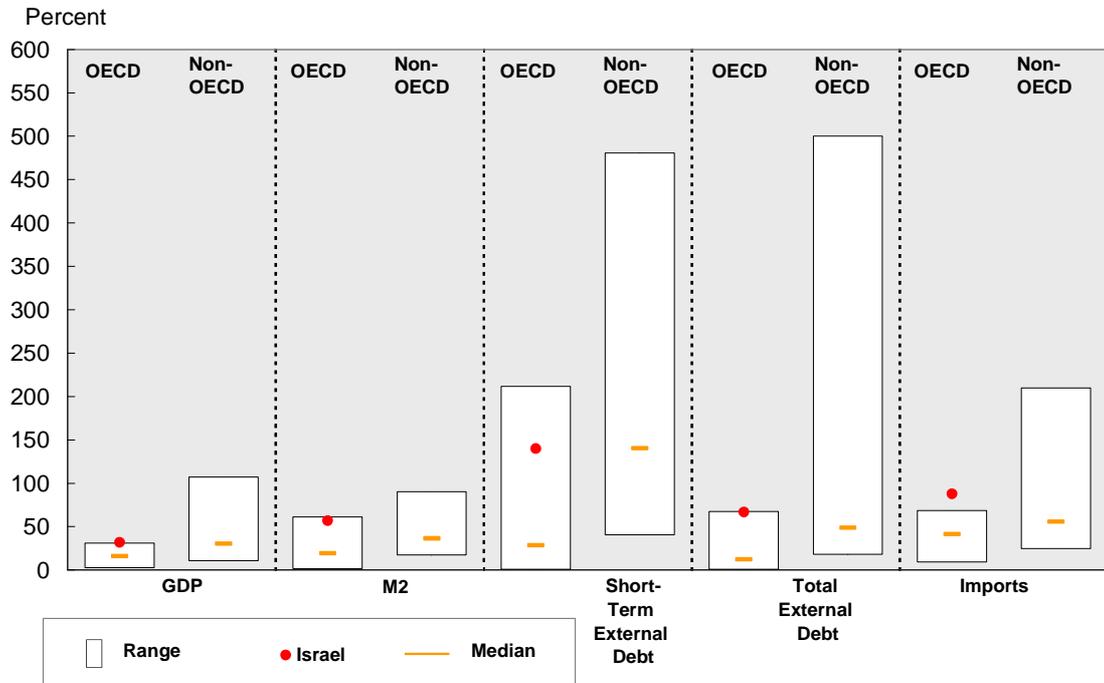
Figure 3 shows the ratio of the foreign exchange reserves to major aggregates in Israel (December 2009 figures appear in the bottom line of Table 1) compared with these ratios in two groups of countries. The first group, indicated as OECD, comprises all the countries that are members of this organization, except for the United States, Japan, eurozone countries and Turkey—all in all 14 countries.⁶ The second group also consists of 14 countries; these are not members of this organization, and are considered as emerging markets with an investment grade rating (BBB and above).⁷ The figure shows that Israel's level of reserves, relative to these aggregates, is generally similar to

⁶ The countries in the OECD group are: Australia, Canada, Czech Republic, Denmark, Hungary, Iceland, Korea, Mexico, New Zealand, Norway, Poland, Sweden, Switzerland, and Germany.

⁷ The countries in the non-OECD group are: Bulgaria, Chile, China, Estonia, India, Latvia, Lithuania, Malaysia, Romania, Russia, Singapore, South Africa, Taiwan, and Thailand.

the upper boundary of the range of countries in the OECD group, and similar to the median of the countries in the second group—the non-OECD countries.

Figure 3 – Level of Reserves at the End of 2009 Relative to Various Aggregates, Israel Compared With Other Countries (In percentages)



B. RESULTS OF INVESTING THE RESERVES IN 2009

The holding-period rate of return on the reserves in terms of the numeraire was 1.91 percent in 2009, compared with 4.3 percent on average in the years 2000-2009 (Table 2 and Figure 4). Because of the weakening of the shekel against some of the currencies in which the reserves are invested, the holding period rate of return in shekel terms was higher this year, 3.6 percent.⁸ This is in contrast to the three previous years in which the return in shekel terms was lower than that measured in terms of the numeraire.⁹

Table 2
The Performance of the Actual Portfolio vis-à-vis the Benchmark, 2000-2009
 (Percent, in numeraire annual terms, weekly standard deviations in annual terms in parentheses)

	Performance		Incremental yield				Dispersion and other contributions
	Actual portfolio	Neutral benchmark	Total	Currency management	Duration management	Asset selection	
2000	6.79 (0.89)	6.78 (0.86)	0.01 (0.11)	-0.15	0.00	0.15	0.01
2001	6.35 (1.44)	6.13 (1.36)	0.22 (0.20)	0.00	-0.01	0.18	-0.01
2002	5.18 (1.32)	4.98 (1.41)	0.20^a (0.17)	0.03	-0.02	0.20	-0.01
2003	2.15 (0.81)	1.94 (0.79)	0.21 (0.09)	0.04	-0.02	0.19	0.00
2004	1.70 (0.66)	1.67 (0.68)	0.03 (0.08)	0.02	-0.05	0.09	-0.02
2005	2.64 (0.60)	2.44 (0.67)	0.21 (0.12)	0.00	-0.03	0.19	0.04
2006	3.83 (0.73)	3.70 (0.79)	0.12 (0.14)	-0.02	-0.05	0.21	-0.01
2007	6.91 (1.37)	6.91 (1.50)	0.00 (0.25)	0.05	0.02	-0.08	0.01
2008	5.95 (1.42)	6.14 (1.46)	-0.19 (0.53)	0.02	0.00	-0.24	0.02
2009	1.91 (0.60)	0.81 (0.65)	1.10 (0.22)	-0.02	-0.01	1.09	0.03
1999-2008	4.32	4.13	0.19	0.00	-0.02	0.20	0.01

^a 5.5 basis points of total incremental yield are not attributed to any listed component in this year.
 SOURCE: Bank of Israel.

⁸ For details, see The Bank of Israel Financial Report for 2009.

⁹ The return on the reserves portfolio, including that in shekel terms, expresses the performance of the various investments in the portfolio, and is not affected by changes in the size of the reserves, or by purchases of foreign currency by the Bank of Israel.

The rate of return on the reserves can be divided into two parts: (1) **The benchmark rate of return**, which is a hypothetical portfolio built according to rules determined in advance, as part of the Bank's investment policy. The benchmark instructs the portfolio manager regarding the various risk priorities that are reflected in the investment policy—such as its currency composition, its duration, the types of assets in it and their distribution along the curve. Furthermore, the benchmark serves as a criterion for review and assessment of the quality of the management and the performance of the reserves portfolio; and (2) **The contribution of active management**, which is measured as the rate-of-return gap between the reserves and its benchmark. The active management is reflected in investment decisions that intentionally create differences in the reserves relative to its benchmark in terms of various parameters (duration, currency composition, types of assets, etc.) in order to achieve added value to the rate of return on the portfolio. The scale of the deviations from the benchmark is limited by a system of conservative rules as part of the Bank's investment policy, and in practice is relatively small. Hence, the decisive factor in determining the holding-period rate of return on the reserves is the composition and the structure of the benchmark, while the contribution of active management is generally relatively small, even though the contribution of the active management this year was exceptional—particularly high. (See below.)¹⁰

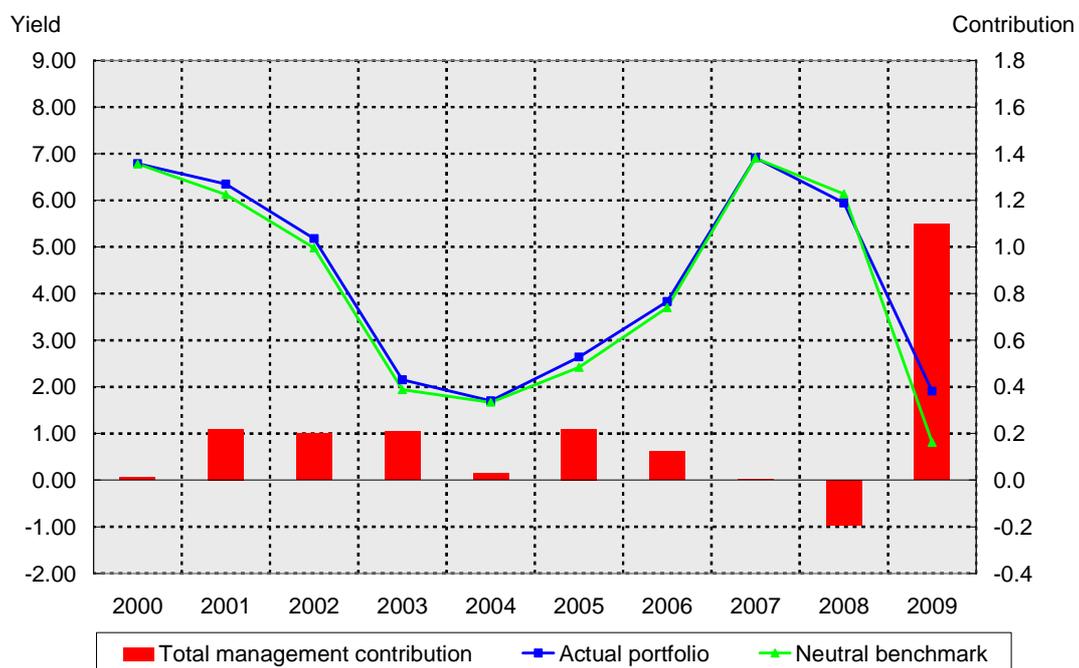
1. The holding-period rate of return and the benchmark risk

This year, the benchmark holding-period rate of return was the lowest in the past decade—0.81 percent compared with an average of 4.1 percent from 2000-2009. This rate of return was affected to a large extent by the slump in yields to maturity fell in world bond markets in which the reserves are invested, and from the low rate-of-interest environment that prevailed in the financial markets during 2009, as a result of the global crisis. During 2009 most of the world's central banks, headed by the United States Federal Reserve, kept the very low interest rates unchanged throughout the year, and even adopted highly unconventional intervention methods in the financial markets with the aim of preventing the collapse of the financial system as a whole, of returning proper functioning to the markets, of

¹⁰ Note further that as opposed to the benchmark rate of return, the portfolio rate of return is also affected by transaction expenses, which act to the detriment of the portfolio's performance compared with the benchmark.

supplying appropriate liquidity, and of energizing the economy. In the United States, Great Britain, and other countries, these steps included an enormous flow of capital into the market, nationalization and the granting of guarantees to financial institutions, various methods of assisting industry, the purchase of "toxic assets" on the one hand, and massive purchases of government and other bonds on the other—as part of a policy of quantitative easing—in addition to broad programs of fiscal stimulation.¹¹

Figure 4 - The Yield and the Total Management Contribution, 2000-2009 (Percent, in numeraire annual terms)



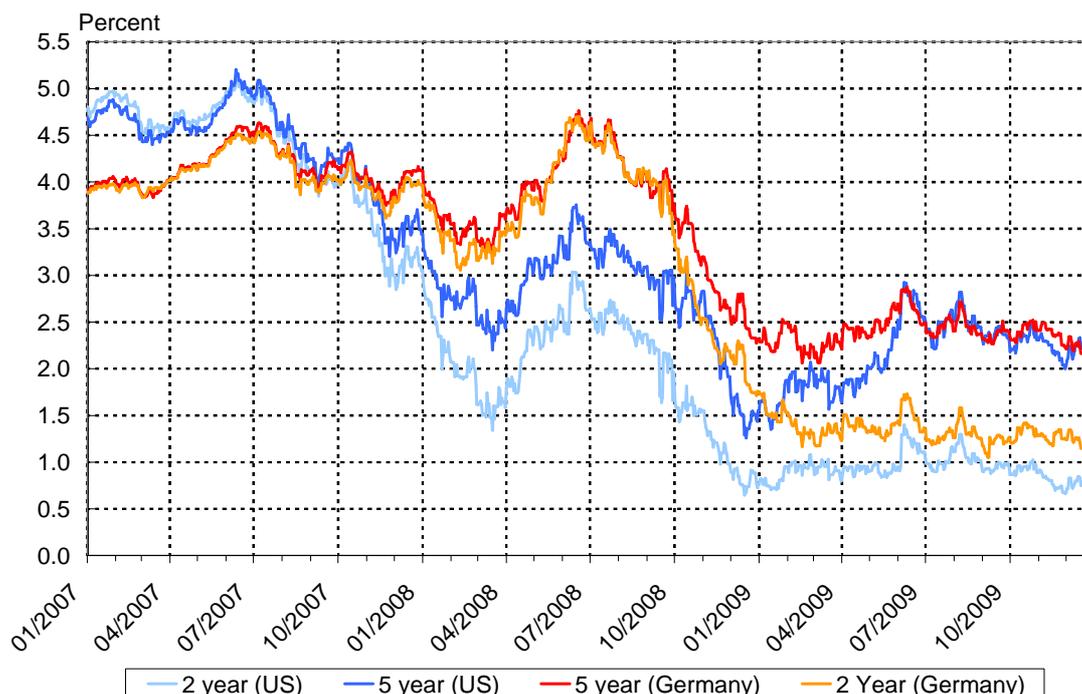
In the wake of these steps, and particularly because of the low interest-rate anchor, the yields to maturity in the bonds markets generally remained low throughout 2009, particularly in the short part of the curve. Two-year yields in the United States, which at the end of 2008 had fallen to their lowest levels (below 1 percent) remained virtually unchanged throughout the year, while the 5-year yields rose during the year by about 100 basis points, and more than the slump level to which they had fallen at the end of 2008 (about 1.5 percent), leading to a steepening of the curve¹² (Figure 5). In Germany the yields to maturity continued to decline slightly from the beginning of the year.

¹¹ For details of macroeconomic and financial developments worldwide in 2009, see Chapter 4 of the Bank of Israel Report for 2009.

¹² During the year the yield changes were not uniform, but overall the curve steepened during the year.

Afterwards, two-year yields stabilized around levels of 1.2 percent to 1.3 percent, and generally remained at this level until the end of the year, while the five-year yields rose slightly toward the middle of the year, thereafter falling back to 2.4 percent to 2.5 percent.¹³

Figure 5 – Yields to Maturity of American Treasury Bonds and Government Bonds in Europe, 2007-2009 (percentages)



In view of the slump in the yield levels to maturity in the United States at the beginning of 2009, it was decided to shorten the duration of the dollar benchmark to 9 months, and to limit the distribution of holding in long-term bonds to bonds with maturities up to three years. This step was taken in order to reduce the risk of losses in the event that the yields curve in the United States would begin to rise overall, or to steepen sharply. The duration of the other currency benchmarks was also shortened slightly in 2009, or was kept at a relatively low level (on average slightly more than a year), and the permitted distribution of the holdings was restricted over the curve, similar to the restriction in the dollar benchmark. The benchmark rate of return, which was very low this year, is a direct result of these steps, which changed the composition of the assets in the benchmark to relatively short, and produced low profits

¹³ Germany is presented as representative of the changes that took place in most of the euro bloc countries.

this year because of the slump in their yields to maturity. Because part of the steepening in the curve in 2009 took place even prior to the actual shortening of the dollar benchmark, and the short-term interest rates remained low, overall for the year the shortening of the benchmark led to a loss of about 8 basis points on the reserves as a whole relative to the possibility of keeping the dollar benchmark unchanged during the year.¹⁴ At the same time it should be recalled that the actions taken to change the duration of the benchmarks and the distribution of assets along the curve, were not taken as a position in order to achieve profits, but rather as insurance against the possibility of large-scale losses that were liable to be caused in the event of a rapid and sharp rise of interest rates and yields to maturity in the bonds markets, which would have caused large capital losses, while in practice incomes from interest were low as a result of the low-interest environment.

The volatility (standard deviation) of the benchmark rate of return in 2009 fell sharply compared with the previous two years to 0.65 percent (Table 2), one of the lowest levels in the past decade. The sharp decrease in volatility this year was mainly a result of the calm that prevailed in the financial markets in 2009, after the global crisis reached its climax—a calm that was supported by the unconventional intervention methods taken by governments and central banks worldwide. The standard deviation of the reserves portfolio, which constitutes a measure of its inherent risk, was lower this year, as in the past five years, because of the greater diversification of the assets held in the portfolio than in the benchmark. The diversification of assets in the portfolio acted to reduce its volatility relative to the benchmark—a phenomenon that was particularly salient in 2007.

2. The contribution and the risk of the active management

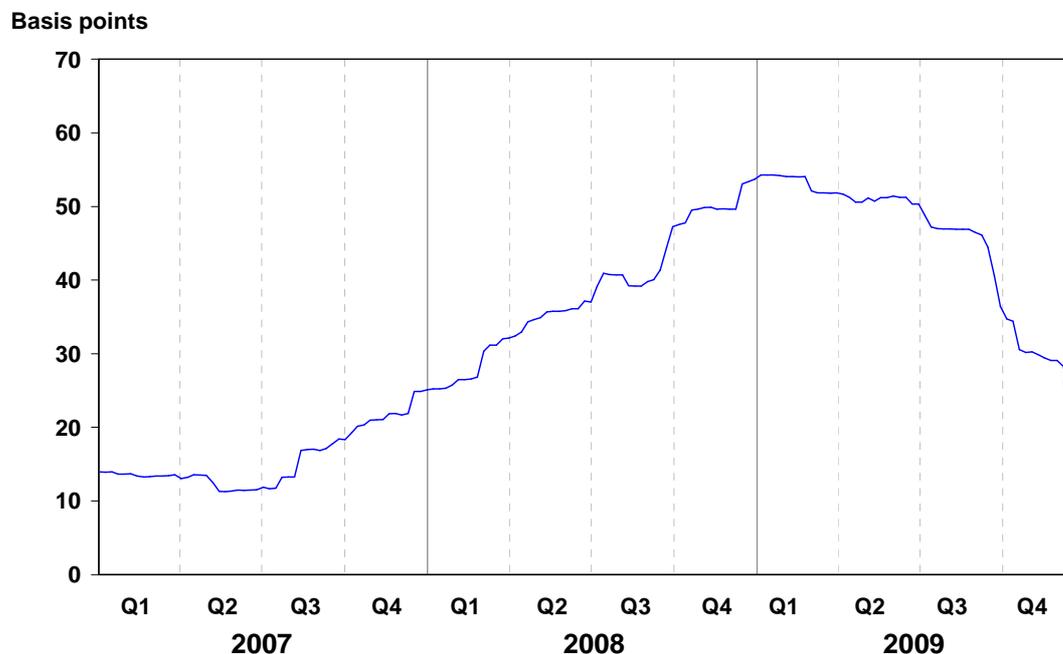
The contribution of the active management this year, which reflects the excess rate of return that was achieved on the reserves portfolio relative to the benchmark, was exceptionally high in general, as well as in comparison with previous years, and added 110 basis points, as against an average excess return of 9 basis points in the years 1999-2008. More than two-thirds of this excess return is credited to investment in spread assets—Eurobonds and other securities, some of them new

¹⁴ Had the dollar benchmark been shortened and the restriction of the dispersion over the curve been adopted from the beginning of 2009, the benchmark would have produced a slightly higher yield than leaving it unchanged.

government-guaranteed issues of banks that were issued in the wake of the crisis.¹⁵

The sharp rise in the excess return on the reserves portfolio this year was accompanied by a continuous decline in the volatility of this contribution (tracking error)¹⁶ to levels similar to those of previous years, following a significant rise in 2008 as a result of the eruption of the global crisis (Table 2, Figure 6). Similar to the previous year, the decrease in the volatility of the contribution of the active management is mainly due to the extreme changes that took place in the markets, and not to a policy change in managing the reserves portfolio.

Figure 6 – Volatility of the Active Management (Tracking Error), 2007-2009
(Moving year, basis points)



The combination this year of a very high excess return and a decrease in volatility (tracking error) back to the acceptable levels of previous years, brought the ratio of excess return to this volatility to the record level of recent years (Figure 7). This ratio, known as the information ratio, is an accepted risk measure that examines the effectiveness of achieving an additional return over the benchmark relative to the risk taken in this regard.

¹⁵ Spread assets are assets whose yields to maturity comprise the yield of another asset, usually government bonds, and a further yield spread that changes in response to market conditions. Eurobond assets are bonds sold in financial markets outside the country of the currency in which they are quoted. The Bank of Israel invests in spread assets that are fully guaranteed by countries with a high investment rating.

¹⁶ The standard deviation of the weekly yield differences in annual terms.

Figure 7 – The Ratio of the Excess Rate of Return to Its Standard Deviation (Tracking Error), 1999-2009

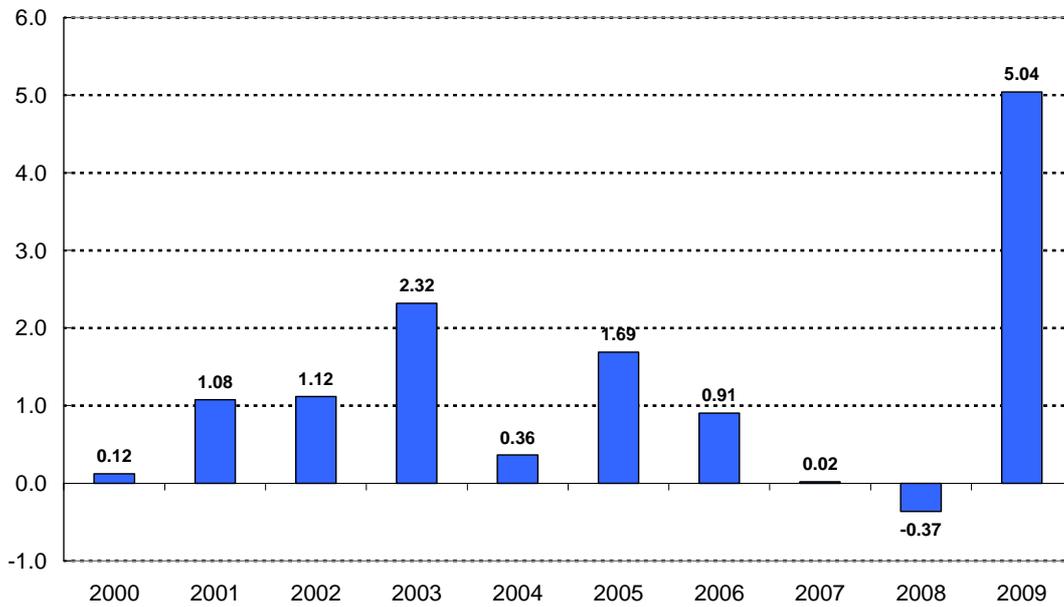
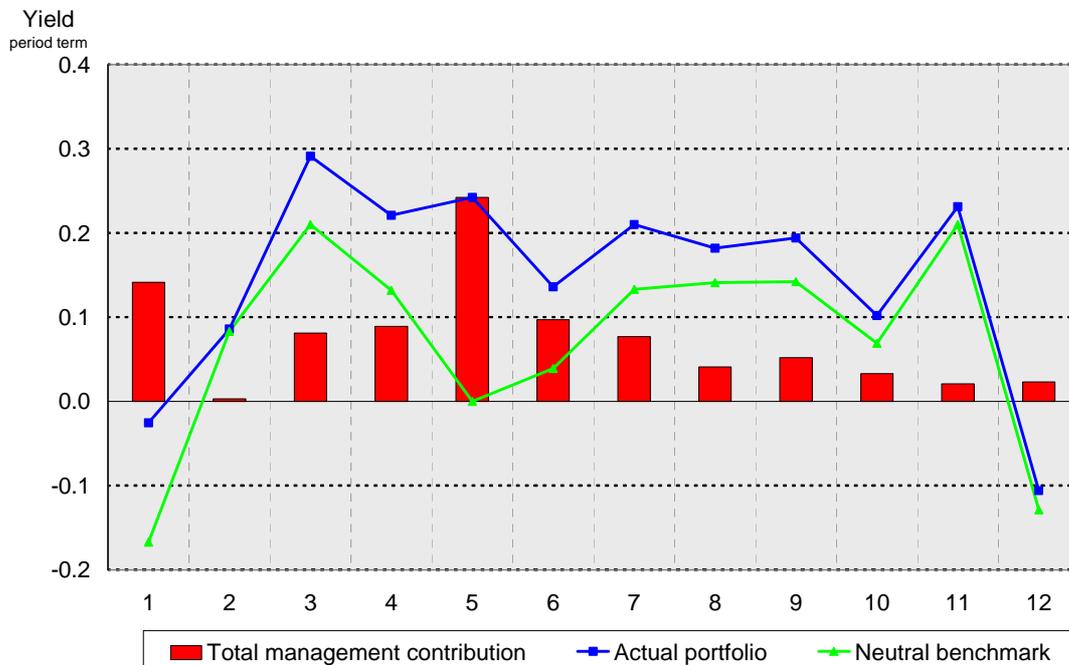


Figure 8 – The Yield and the Total Management Contribution, January-December 2009 (Percent, in monthly terms)



In 2009 the excess return on the reserves portfolio was positive throughout the year, but not uniformly so: the major excess return was achieved in the first half of the year (Figure 8). **The excess return this year was affected almost entirely by the asset**

selection, while the contributions of the duration and the currency management were negative and close to zero, and the contribution of the yield curve positions was only 3 basis points. This result characterizes previous years as well, in which the contributions of the duration, the currency management and the yield curve positions were also not generally large, and the major contribution to the excess return arose from the asset selection, which this year was exceptional and very high compared with previous years (Table 2)

Figure 9 – Asset Distribution of the Reserves, 2009

(Annual average, percentages)

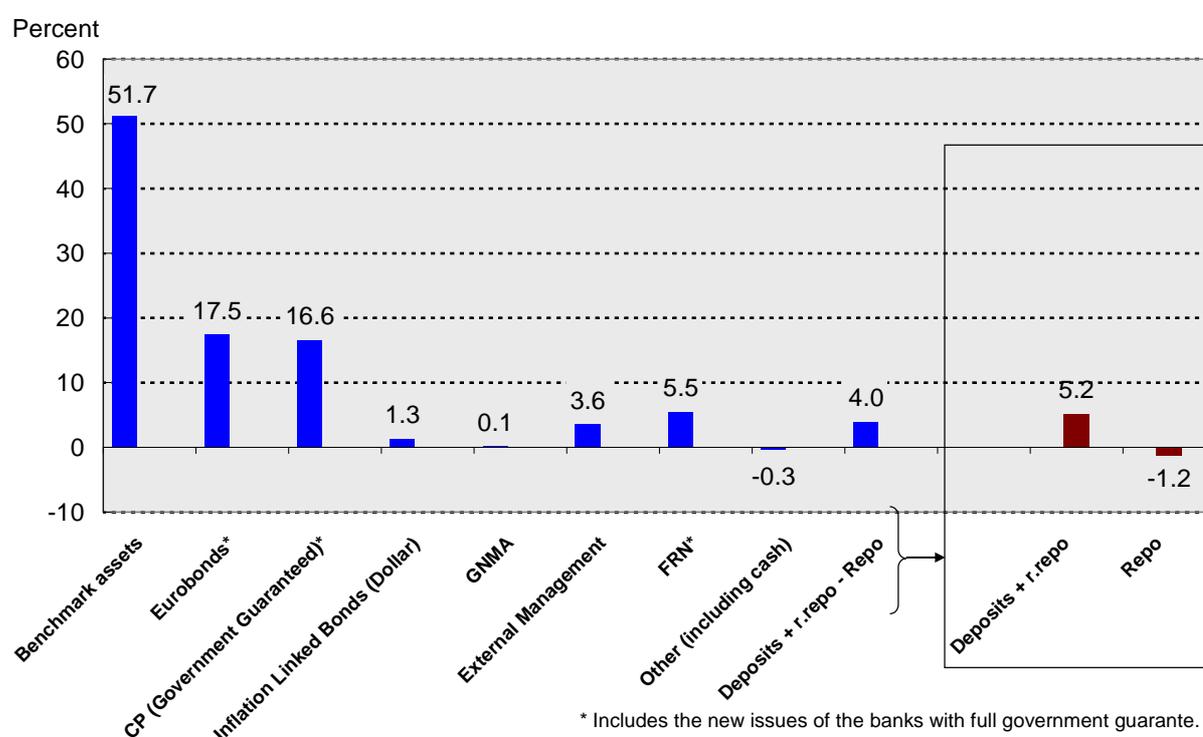


Table 3 shows a breakdown of the contribution of asset selection by type. The highest contribution to the reserves this year was the selection of long-term assets—a contribution of 59.3 basis points. These assets include a high proportion of spread assets, mainly Eurobonds (Figure 9). The yield spreads between Eurobonds and government bonds declined sharply this year, after rising to record levels at the end of the previous year, with the eruption of the crisis. The narrowing in yield spreads of around 80 to 90 basis points throughout 2009, until they fell to levels characterizing the years prior to the crisis (Figure 10), produced large capital gains on the various spread assets, mainly the Eurobonds. This narrowing reflected the decline in risk aversion by

investors in the wake of the decreasing uncertainty in financial markets worldwide, and a considerable improvement in them, which had already begun by the end of the first quarter of 2009.

Table 3
The Contribution of Asset Selection^a, 2007-2009 (basis points, in annual terms)

	2007	2008	2009
Securities lending by the Department	7.6	5.8	0.1
Short term assets (up to 1 year)	3.7	16.3	26.2
Long term assets (longer than 1 year)	-14.2	-33.6	59.3
Inflation-linked securities	-2.5	-2.7	7.9
GNMA	-4.5	-6.7	0.1
Assets in external management	1.6	-3.3	15.8
Total	-8.3	-24.1	109.3

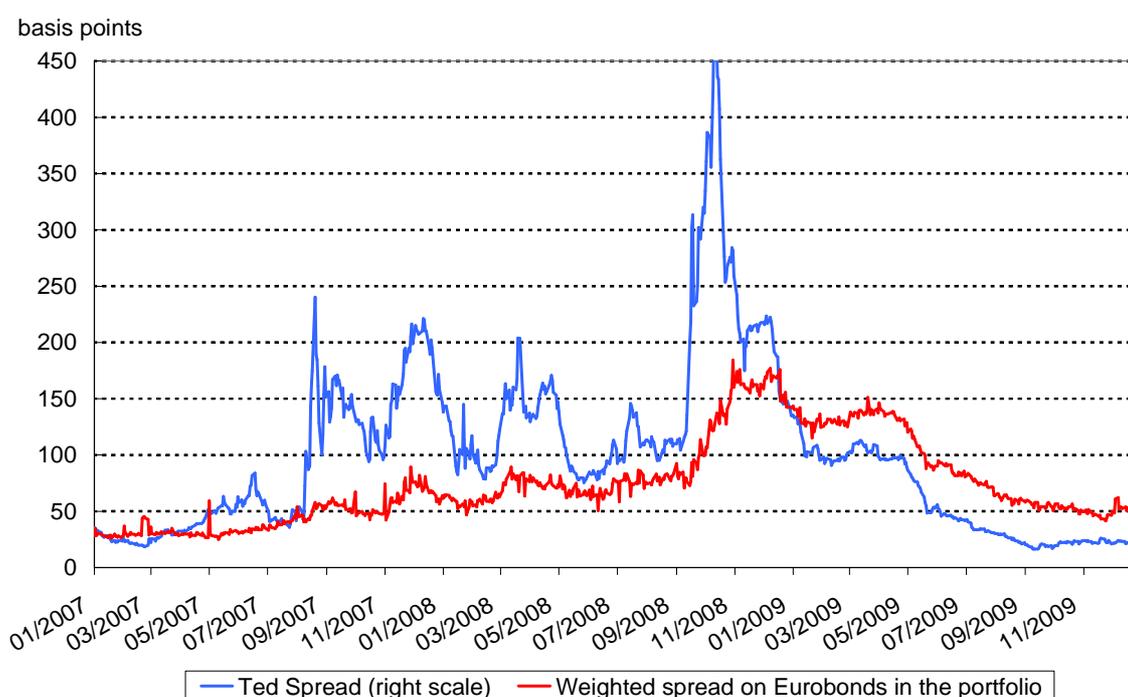
SOURCE: Bank of Israel.

^a Also includes the contribution of the asset dispersion along the curve, relative to the benchmark.

Two further factors were responsible for the substantial profits of Eurobonds this year: (1) At the beginning of 2009 the Bank of Israel increased its holdings in dollar Eurobonds, whose yield spreads were at a historic high, at the expense of American Treasury bills, whose yield to maturity was very low, and there was a fear that their holding-period rate of return would be negative—if the yields curve were to rise sharply; (2) At the end of 2008 and the beginning of 2009, as part of the steps for extricating the financial sector from the crisis, new issues of securities of various kinds entered the market, including Eurobonds of banks and other financial institutions in the United States, the United Kingdom and other countries, which, , were fully government guaranteed. The Bank of Israel acted quickly and purchased these assets soon after their entry into the market, when they were still cheap and with a greater spread than that of similar Eurobonds in the market. Later in the year, as the state of the global financial system improved, most financial institutions resumed the issue of bonds without government guarantee, and the prices of guaranteed issues rose considerably, beyond the rise in prices of the other Eurobonds in the market. The investment in the issue by the banks of government-guaranteed Eurobonds thus produced large profits for the portfolio.

The short-term spread assets contributed this year to an excess return of about 26 basis points. Prominent among the short-term spread assets that produced very high excess returns this year were FRN¹⁷ bonds, mostly government-guaranteed new issues by banks in 2009, which benefited from high capital gains as a result of the narrowing in yield spreads and a rise in their prices during the year. Also, spread assets bearing short-term interest, which by and large are new issues of banks backed by government guarantees, such as commercial papers (CPs)—enjoyed, particularly at the beginning of the year, high incomes from interest, thanks to their relatively high level of short-term spread, for example, the TED-spread.¹⁸ These spreads rose greatly at the end of 2008 and remained quite high throughout the first half of 2009 (Figure 10).

Figure 10 – The Three-month TED Spread and the Average Spread of Eurobond Assets in the Reserves, 2007-2009



Significant contributions in asset selections were also obtained in inflation-indexed government bonds and in externally managed portfolios.¹⁹ The prices of indexed US government bonds (TIPS) increased significantly during the year compared with regular Treasury bonds. The reason was the significant rise during 2009 in break-even

¹⁷ Floating rate note bonds.

¹⁸ The spread between the Libor interest rate (usually for 3 months) and the yield on American Treasury bonds for the same period.

¹⁹ The Bank of Israel manages a small proportion of the foreign exchange reserves through external managers. These portfolios include mainly GNMA assets and Treasury bonds, and the managers have a similar degree of freedom in managing the duration to that of the internal management.

rates after these fell sharply, even becoming negative at the end of 2008, with the outbreak of the crisis. The excess performances of the externally managed portfolios are mainly a result of successful investments in the GNMA sector, which produced high yields this year—particularly in the first half with the strengthening of the mortgages sector in the United States, and the narrowing of the spreads between GNMA assets and American Treasury bonds. These results were reinforced by purchases of mortgage-backed assets by the US government during the year.

Because of the cessation of deposits in banks when the crisis broke out in 2008 (as described in the box at the end of the report), the securities lending whose returns were deposited in the banks (Repo-Depo) was also stopped. This had been the major part of the securities-lending transactions in previous years—hence their negligible contribution to excess return this year.²⁰

3. The yield on the dollar portfolio relative to other managed portfolios

In order to compare the performance of the Bank of Israel's dollar portfolio to other portfolios we used data on the performance of 11 mutual funds that operated in the American market from 2000-2009. These funds were primarily invested in US government bonds. Some of the funds are classified as “investors in short-term government bonds”; the rest are “general investors in government bonds,” which, in practice, invest in the medium term. The funds invested no more than a small proportion of their portfolios in indexed US government bonds (TIPS) and in low-rated assets (less than AA).²¹ These permit a rough comparison between the performance of the Bank of Israel's US dollar portfolio and that of the eleven mutual funds despite the differences between them.²² Comparing the performance of different portfolios is problematic—both because they are generally managed relative to different benchmarks, and because of the differences in the management rules and the investment policy applying to them. Nevertheless, a comparison with the performance

²⁰ In previous years the contribution of securities-lending transactions to excess return was generally 3-7 basis points, and its weight in the overall asset contribution was relatively high. (By comparison—the average asset contribution over the past decade has been 20 basis points.)

²¹ Possibly the component of corporate bonds is also included within these—which the Bank of Israel is precluded from investing in.

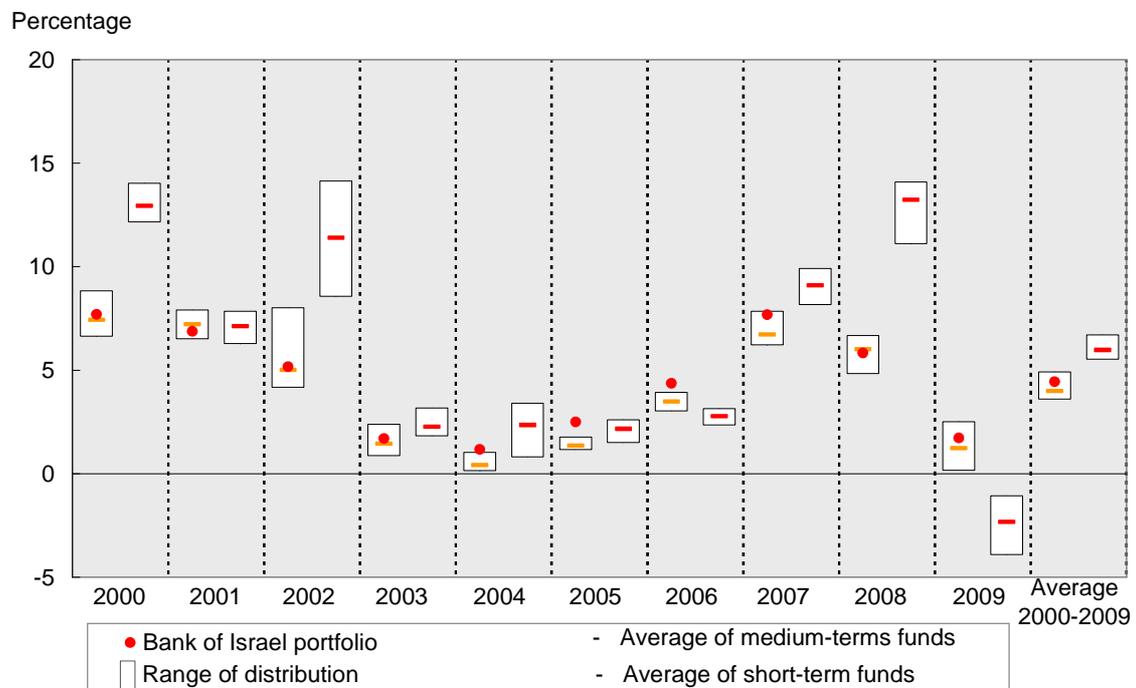
²² Bear in mind that the performance of the mutual funds is after deducting commission, which reflects the cost of the current operating expenses, while the performance of the dollar portfolio of the Bank of Israel's reserves is reported without deducting expenses of this kind.

of portfolios of similar character can provide a measure to the dollar portfolio performance.

An examination of the range of the yields (Figure 11) indicates that the performance of the dollar portfolio over the years was within or above the range of the "short-term" fund yields. In 2009, the yield of the dollar portfolio was within the upper part of the distribution of yields of the short-term funds, 50 basis points higher than their average yield. Taking the decade as a whole, the average annual yield of the Bank of Israel's US dollar portfolio was greater than that of the "short-term" mutual funds, but still less than that of the "medium-term" ones.

In contrast to recent years, this year the yield on the medium-term funds was negative, -2.3 percent on average. This was apparently owing to the steepening of the yields curve in the United States during the year, against the background of the very low yields to maturity that prevailed at the beginning, which adversely affected these funds as they are more long-term.

Figure 11 – Performance Distribution of Managers of Mutual Funds in the US Market, 2000-2009 (Percentages, in annual terms)

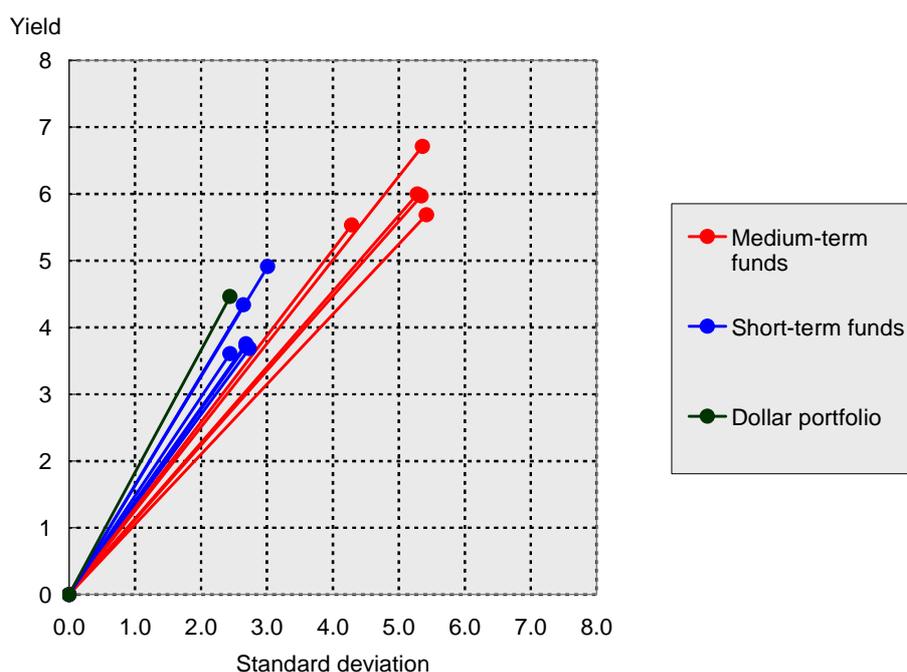


An examination of the data of the funds shows that the duration of the Bank of Israel's dollar portfolio is closer to that of the short-term funds than to that of the medium-term

ones, and therefore that their performance is more similar to that of the short-term funds. The data also shows that on average over the decade, the medium-term funds achieved a higher yield than that of the short-term ones, but their annual yield was more volatile, and in the past year even negative. This demonstrates the Bank of Israel's choice to invest the foreign exchange reserves in assets of relatively short duration, in order to reduce the volatility of the annual holding-period yields and the risk of obtaining a negative yield in the reserves portfolio, even at the price of relinquishing a possible higher average yield over several years.

The average yield of each fund compared with its volatility in the past decade (Figure 12) shows that in the dollar portfolio the yield-to-risk ratio, which is reflected by the slopes of the lines, is higher than in all the other funds, and is therefore preferable to all of them in this respect. If we examine only the short-term funds it appears that the dollar portfolio is preferable to all of them, with one exception, in its average yield in the past decade as well. Furthermore, the yield-to-risk ratio in the short-term funds is greater than in the medium-term ones; in other words, the excess return that the medium-term funds show over the short-term ones is achieved at the expense of even greater risk.

Figure 12 – Yield and Risk: the Dollar Portfolio vis-à-vis Funds in the US Market, 2000-2009 (Percentages, in annual terms)



THE GLOBAL CRISIS—MANAGING CREDIT RISKS AND THE OPERATIONAL RISK IN THE MARKET OPERATIONS DEPARTMENT

With the emergence of the subprime crisis in 2007 and the instability that continued in the markets through 2008, the Bank of Israel increased its level of financial sector monitoring and the ongoing review of current developments in the developed countries. From September 2008, with the fall of the Lehman Brothers investment bank, and the full-blown eruption of the crisis in financial markets worldwide, uncertainty increased greatly, and the financial risks in the reserves portfolio grew—particularly credit risks. The disruptions in the markets, a result of the global crisis, adversely affected also the functioning of many financial institutions and raised the risks of failures and disruptions in their current business activity—a situation that led to an increase in the level of operational risk to which the Bank of Israel was exposed.

In reaction to the increasing credit risk, already in 2008 and more intensively since the eruption of the crisis, the Bank of Israel took the following steps to reduce exposure to credit risks and to increase the holdings of liquid assets:

- Prohibiting deposits in banks (including CDs), in the wake of which the lending transactions of securities against deposits (Repo-Depo) were stopped;
- Raising the rating level required for countries in which it is permissible to invest, and restricting the exposure to countries whose financial situation had worsened;
- Adding restrictions to the levels of liquidity required in the reserves of various currencies;
- Updating the existing legal agreements and developing a mechanism of daily collateral (Margin) in order to reduce the daily exposure;
- Adding agreements for transactions in derivatives (ISDA),²³ which previously had been drawn up in a way that was accepted in the markets, but without a detailed and binding legal agreement;
- Adding shekel-dollar conversion transactions with the local banks to the CLS²⁴ clearing.

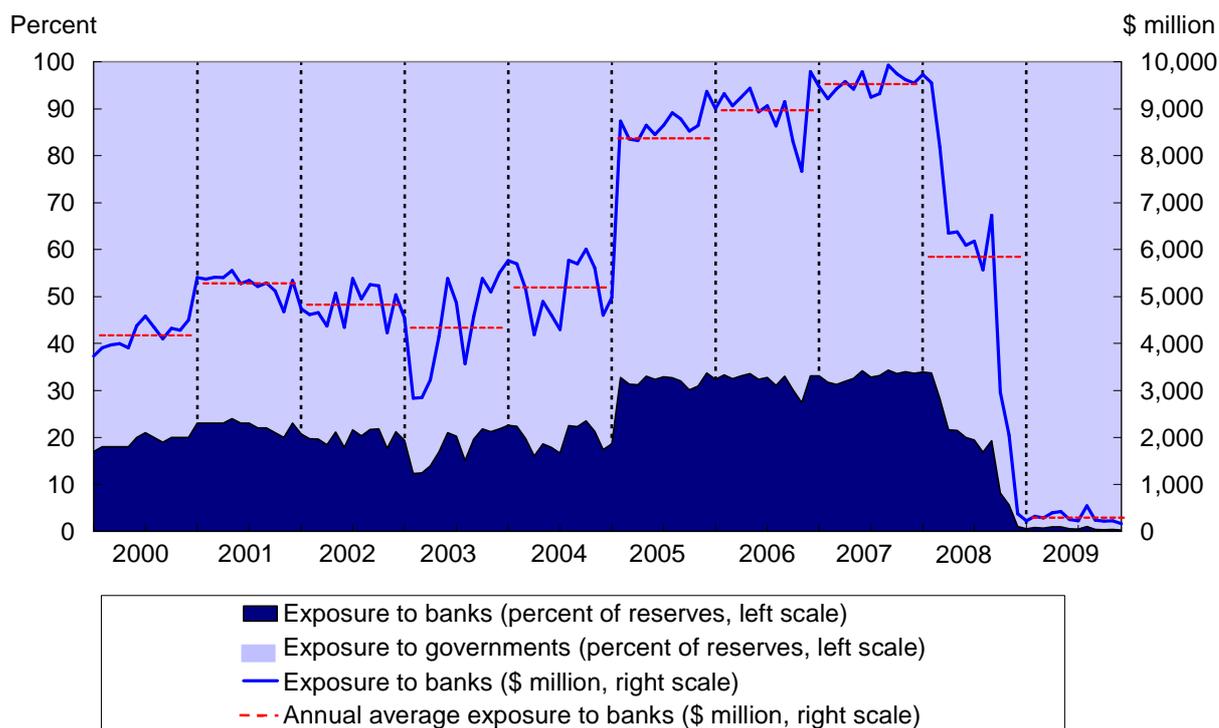
The banking exposure, which throughout the years constituted a very important part of the portfolio, was lowered to almost zero at the end of 2008, and remained at this level

²³ International Swaps and Derivatives Association.

²⁴ System of international clearing by the CLS Bank, which was established in order to minimize clearing risks in conversion transactions and international payments.

during 2009 in the wake of the cessation of deposits in the banks. Even though calm began to return to the markets from the second quarter of 2009, and uncertainty decreased, many risks still threatened the global financial system. Because of this, the Bank of Israel did not ease its investment policy, and most of the steps taken with the outbreak of the crisis for limiting the exposure in the reserves portfolio, remained in place throughout the year.

Figure 13 – Distribution of Exposure to Banks and to Governments, 2000-2009



As part of reducing the operational risk, the marketing department tightened control of its work processes, ceased complex activity of lending securities from the Bank of Israel's portfolio, and took other steps to reduce the operational risk in various sections of the department.

Concurrently with its handling the growth of risks resulting from the crisis, the Marketing Operations Department took various other steps to reduce the operational risk—among them combining the Bank of Israel's activities in shekels in the local market with the department's area of activity, as part of the recent re-organization process in the Bank. The department is currently promoting a multi-year project that is expected to be completed by the beginning of 2011, in which the foreign exchange reserves and the activity in the local market (recording transactions, creating messages,

market-risk management, performance measurement, accounting development, cash-flow management, and reconciliation of nostro accounts) will be managed by a new computer system. The new system will replace several systems currently in operation in the department, which will unify all its activity into a single platform, thereby reducing the operational risk.