Bank of Israel

Investment of the

Foreign Exchange Reserves

Annual Report 2021

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Main points

Level of the reserves

Israel's foreign exchange reserves at the end of 2021 were $213 billion, an increase of $39.7 billion over the course of the year, compared with the preceding year. The level of the reserves relative to GDP increased from 42.5 percent to 46.6 percent.

Sources of the change in the reserves

The increase in the reserves derived mainly from foreign exchange purchases by the Bank of Israel totaling $35 billion as part of the implementation of the monetary policy plan for the economy to deal with the COVID-19 crisis, and in addition from profits, revenue, and exchange rate and price differentials (mark to market) totaling $3 billion, and from private sector deposits totaling $2 billion.

Composition of assets in the reserves

As of the end of 2021, 66 percent of the reserves were invested in government assets, 18 percent in equities, 9 percent in spread assets, and 7 percent in corporate bonds.

Return on the portfolio in terms of the currency benchmark

In terms of the currency benchmark (a basket of currencies comprised primarily of the dollar and euro), the rate of return on the reserves portfolio in 2021 was 2.9 percent, over the past three years it has averaged 4.4 percent per year, and over the past five years it has averaged 3.2 percent per year (Table 1a).

Table 1a
Rate of return on the foreign exchange reserves portfolio, annual and multiyear perspectives, in terms of the currency benchmark, percent, annual terms

	2021	3 years	5 years
Reserves portfolio return	2.9	4.4	3.2
Basic benchmark return	-0.3	0.6	0.6
Excess return	3.2	3.7	2.6

Return on the portfolio in shekel terms

The rate of return in shekel terms in 2021 was negative, at -2.9 percent, due to the appreciation of the shekel vis-à-vis the main currencies in which the reserves are held, at a rate of 5.7 percent.

Table 1b
Rate of return on the foreign exchange reserves portfolio, annual and multiyear perspectives, in terms of the shekel, percent, annual terms

	2021	3 years	5 years
Reserves portfolio return	-2.9	-2.0	-0.6
Change in exchange rate of currency benchmark/shekel	-5.7	-6.1	-3.7

A negative sign in the change of the exchange rate indicates appreciation of the shekel.

Contribution of active management in terms of the currency benchmark

The contribution of active portfolio management, measured by comparing the portfolio return with the risk-free portfolio (the basic benchmark) return, was 3.2 percent in 2021. This was contributed by equities—3.6 percent, primarily through the investment in US equities—2.5 percent, and was offset by duration— -0.6 percent.

Risk level in the portfolio

The portfolio's risk level is the result of the share of risk assets in the portfolio as well as the volatility in financial markets. The portfolio's volatility, which reflects its risk level, declined in 2021 compared to the peak it reached in the year before. This was due to the decline in the volatility of financial assets, and despite the increase in the share of equities in the portfolio. The standard deviation of the portfolio's return, which measures this volatility, was 1.8 percent in 2021.

Update of the investment policy guidelines

The marked increase in the level of the reserves, which derives mainly from the Bank of Israel's foreign exchange purchases as part of the implementation of the monetary policy, led the Bank to examine the need to adjust the goals on which the reserves investment policy is based and the policy's characteristics. In view of the examination, the Monetary Committee approved a new version of the investment policy guidelines[1] in April 2021.

The main changes in the new version are: adjusting the investment policy goals so that a goal was set to achieve a return in shekel terms that, in the long term, will cover at least the financing cost of holding the reserves; measuring and reporting the portfolio return both in terms of the currency benchmark and in shekel terms; defining new principles for determining the currency benchmark composition; increasing the maximum risk constraint from a $CVaR_{5\%}$ level of 475 basis points to a level of 900 basis points; increasing the maximum share of investment in equities from 17.5 percent to 27 percent of total reserves; increasing the maximum share of combined investment in equities and corporate bonds from 25 percent to 35 percent, and adding the possibility of investing in below investment grade (high yield) corporate bonds, up to 5 percent of total reserves.

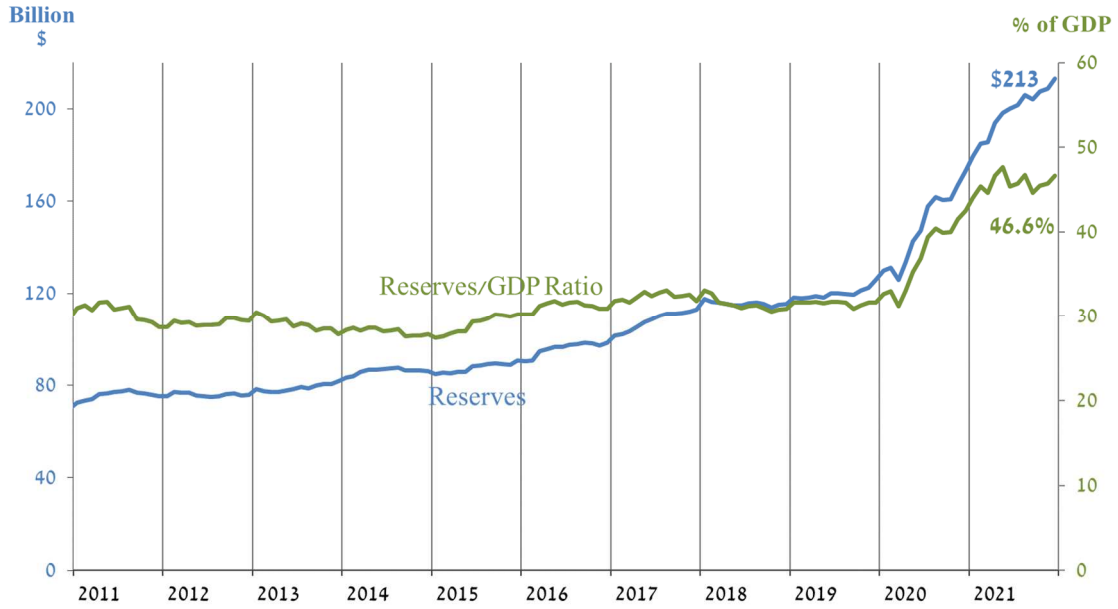
The Monetary Committee approved the allocation for 2021 based on the new investment policy guidelines.

[1] See Box 1 in the report.

A. The Level of the Foreign Exchange Reserves

In 2021, Israel's foreign exchange reserves grew by $39.7 billion, from $173.3 billion at the end of 2020 to $213 billion at the end of 2021 (Figure 1).[2] **The ratio of the reserves to GDP rose from 42.5 percent[3] to 46.6 percent**.

Figure 1
The Level of Israel's Foreign Exchange Reserves, and the Ratio of the Reserves to GDP, 2011–2021 (month-end balance)



Source: Bank of Israel.

The increase in the reserves resulted mainly from foreign exchange purchases in the amount of $34.8 billion by the Bank of Israel, private sector deposits of $2 billion, and price differential (mark-to-market)[4] of $3.3 billion (Table 2), which comprised:

1. The amount of $5.3 billion from gains due to an increase in the value of equities, offset by capital losses on bonds, deriving from increases in yield;
2. The amount of $2.6 billion in respect of an increase in the IMF's general allocation of SDRs, as part of the IMF's allocation to all its member states;
3. In contrast, $4.7 billion from losses due to exchange rate differentials, mainly of the euro and the pound sterling, in which approximately 30 percent of the reserves are held, due to the weakening of these currencies against the dollar.

[2] The level of the reserves throughout the Report includes the International Monetary Fund's allocations of SDRs and the balance of Israel's reserve tranche in the IMF. At the end of 2021, their combined level was $4.7 billion. For more on this issue, see "Bank of Israel Financial Statements for 2021."
[3] This figure is calculated on the basis of GDP data for the year 2020, which have been updated since the publication date of the report for 2020.
[4] The mark-to-market is the change in the dollar value of the reserves attributed to profits realized from interest income, capital gains, and the change in value due to asset price differentials and exchange rate differentials, against the dollar, of currencies in which the reserves are invested.

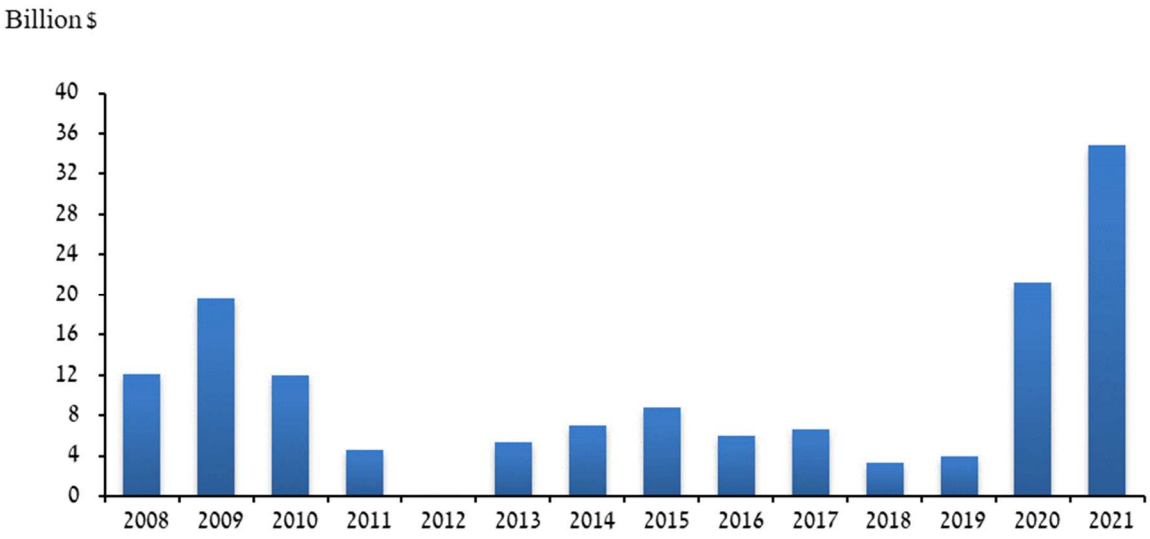
Table 2
Components of the change in the reserves, 2021
($ million)

FX Purchase	34,797
Mark to Market	3,304
Private Sector	2,062
Government	-462
Total Change	**39,701**

Source: Bank of Israel

Foreign exchange purchases were considerably larger in scope compared to previous years (Figure 2). Most of the purchases were part of a $30 billion purchase program that was announced by the Monetary Committee[5] at the beginning of the year, as part of the Bank's monetary policy.[6]

Figure 2
Bank of Israel Foreign Exchange Purchases, 2008–2021

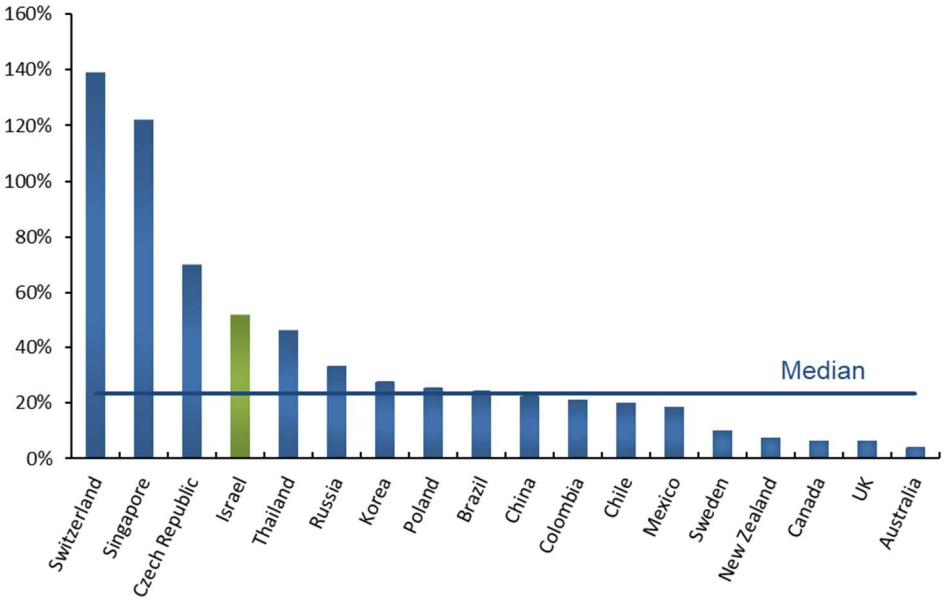


Source: Bank of Israel.

[5] Press Release, January 14, 2021.
[6] See Box on "Exchange rate policy at the Bank of Israel: Reasons, outcomes and decision-making process" available at https://www.boi.org.il/en/NewsAndPublications/PressReleases/Documents/MPR%20July-December%202016.pdf

Reserves are commonly measured relative to various economic aggregates, mainly GDP. It can be seen that the ratio of reserves to GDP for Israel is higher than the median of other countries (Figure 3).

Figure 3
The Ratio of the Reserves[1] to GDP, Israel and Selected Countries



[1]Level of reserves as of 31.12.2021 and the GDP data as of 31.12.2020
Source: Central Bureau of Statistics, International Monetary Fund, World Bank

B. The Framework for Managing the Foreign Exchange Reserves

1. Objectives of holding the reserves and the guidelines for reserves management

According to the **Bank of Israel Law, 5770–2010**, one of the Bank's functions is to hold and manage the country's foreign exchange reserves. Foreign exchange reserves held by a country function as the inventory of foreign currency for its economy at a scope that is sufficient during a crisis or state of emergency (for example, in the event of a war or natural disaster). At such times, foreign currency reserves remain a country's main source of financing in foreign currency.

The Monetary Committee, which is headed by the Governor and whose members include representatives of the public, has the authority to establish **guidelines for the investment policy of the reserves** (Appendix 2), in consultation with the Minister of Finance, and to monitor the implementation of this policy.

The **investment guidelines** include the specification of the assets permitted for investment, the risk profile, and the quantitative and qualitative limitations on types of assets permitted for investment. It should be emphasized that these guidelines do not constitute a recommendation for the actual composition of investment in these assets. The actual proportions of investment are a function of the annual strategic asset allocation process and the deviations from the allocation that are made within the framework of degrees of freedom granted to the Markets Department by the Monetary Committee. The strategic asset allocation is determined subject to the level of risk set by the Committee, and is based on assessments of the expected conditions in the relevant financial markets (see Section 3 of this chapter for further discussion of the allocation process).

Due to the considerable increase in the reserves, which stems mainly from foreign exchange purchases by the Bank of Israel as part of the implementation of the monetary policy, the Bank of Israel reviewed the need to adjust the objectives on which the reserves investment policy is based. In April 2021, the Monetary Committee approved a new version of the guidelines (see Box 1) with the following goals:

- Achieving a return in shekel terms that, in the long term, will cover at least the financing cost of holding the reserves;[7]
- Maximizing the holding rate of return in the medium term, in terms of the currency benchmark, and within the framework of the risk profile, subject to attaining the liquidity goal;
- Managing the reserves at a high level of liquidity.

Following the adjustment to the investment goals, additional modifications were made to the guidelines for the investment policy. The main changes were: measuring and reporting the return on the reserves portfolio both in terms of the currency benchmark and in shekel terms; defining new principles for determining the currency benchmark composition; increasing the maximum risk constraint from a $CVaR_{5\%}$ level of 475 basis points to a level of 900 basis points; increasing the maximum share of investment in equities from 17.5 percent to 27 percent of total reserves; increasing the maximum share of combined investment in equities and corporate bonds from 25 percent to 35 percent, and adding the possibility of investing in below investment-grade (high yield) corporate bonds, up to 5 percent of total reserves.

[7] The financing cost of holding the reserves is the gap between the cost in shekels of raising the capital required for holding the reserves and the return of the foreign exchange reserves in terms of the currency benchmark with the addition of the gain or loss from the currency exposure vis-à-vis the shekel.

Box 1: The changes in the reserves' investment policy guidelines

In April 2021, the Monetary Committee approved the new version of the guidelines (see Appendix 2) after a process of consultation with the Minister of Finance as required by law.

The considerations behind the decision to change the guidelines

The main goal of holding the reserves is to supply foreign currency to the economy at a sufficient scope in a time of crisis or emergency, so the reserves will remain the State's main source of foreign currency financing. In order to attain this goal, the Bank of Israel, similar to many other central banks, defined in the past the following investment goals: safety—maintaining the purchasing power of the reserves in terms of the expected uses in a crisis, liquidity, and achieving an adequate return. The Monetary Committee has updated the guidelines over the years with the growth in the reserves and with the decline in the interest rates. The last update was in January 2019, when the reserves level was $118 billion. Since then, their level increased to $173 billion at the end of 2020, and to $213 billion at the end of 2021. In view of the increase in the level of the reserves, the Monetary Committee reexamined the investment policy, and particularly the investment goals, the risk profile, and the principles for determining the currency benchmark composition.

Following are the main considerations in examining the investment policy:

a. **The level of the reserves and the uses approach in a time of crisis or emergency:** As noted, in the past, one of the main goals established for the investment policy was to maintain the purchasing power of the reserves in terms of the expected uses during a crisis. This is because in a scenario of a sharp depreciation vis-à-vis the usage currencies, the ability of the reserves to finance the uses is liable to be adversely impacted. Therefore, the measurement currency is determined based on an estimate of the composition of expected uses. However, the higher the level of the reserves and the further away it is from the level required for uses, the smaller the reserves' sensitivity to a deviation from the currency composition of the uses.
Currently the level of the reserves is considerably higher than the level required for uses. At this level of the reserves, it is not relevant to maintain the purchasing power of the reserves in terms of the uses. This is because the Bank has a large enough "cushion", which enables it to invest the reserves in a currency composition that is different than the uses composition, without risking the ability to finance their uses, even in a scenario of a sharp depreciation vis-à-vis the uses currencies.

b. **The level of the reserves and the balance between safety of the reserves and achieving a return:** The importance of achieving a suitable return increases the higher the level of the reserves is. The marginal utility of holding them, which derives from a decline in the country's risk premium and the decreased probability of a crisis, declines with their growth. In contrast, their holding cost—the spread between the financing cost and the yield generated by the reserves portfolio—does not change in relative terms, but increases in absolute terms. Thus, on the cost-benefit balance, the marginal contribution to the economy from holding the reserves declines with their growth. Therefore, when the level of the reserves increases, so does the importance of achieving a return that will reduce their holding cost, even if it means some increase in the risk level in the short term. At the reserves' current level, which is markedly higher than the level required for the uses, it is not relevant to maintain the reserves' purchasing power in terms of the uses, and it is more correct for the main target to be achieving a shekel return in the long term that will at least cover the financing cost of holding the reserves (the shekel liabilities in the balance sheet).
Due to these considerations, it was decided **to adjust the investment policy targets for the reserves portfolio** so that they will be consistent with the reserves level. The previous targets of maintaining the purchasing power of the reserves in terms of the measurement currency (the numeraire) and

achieving a suitable holding rate of return were replaced by the target of **achieving a shekel return** that, in the long term, will cover at least the financing cost of holding the reserves.
The currency risk vis-à-vis the shekel is difficult to manage as the reserves are invested only in foreign currency. Maximizing the return in terms of the currency benchmark increases the probability of attaining the goal of the shekel return. Therefore, **maximizing the holding rate of return in terms of the currency benchmark** in the medium term was also set as a target.
The liquidity target was kept unchanged.

c. **The measurement currency**—the foreign exchange reserves are invested only in foreign currency, so there is a need for a currency benchmark of the foreign currencies, which will serve as a basis for allocating the assets in the portfolio. The previous currency benchmark, the numeraire, was derived from the investment goal of maintaining the purchasing power of the reserves in terms of the expected uses during a crisis. Changing the investment goals **and setting a goal of a shekel return requires changes in the currency benchmark composition.** With setting a goal of the shekel return, there is also a need to diversify the exchange-rate risk vis-à-vis the shekel over a broader currency benchmark than the numeraire, which included three reserve currencies, with the goal of minimizing the volatility of the reserves' return in terms of the shekel over the long term. In addition, the currency benchmark must comply with the principles of stability over time and it is to include currencies known as reserve currencies in countries with varied and liquid asset markets.
In accordance with the long-term target of covering the cost of financing the reserves, **the reserves' return is to be measured and reported in shekel terms**. In accordance with the target of maximizing the return in terms of the currency benchmark, **the reserves' return should also continue to be measured and reported in terms of the currency benchmark**, which measures the quality of the management and the investment decisions that were made.

d. **The level of the reserves and the risk profile**: The higher the level of the reserves is, the smaller the relative portion of the reserves that has to be available for immediate use in an emergency. Therefore, it is possible and even appropriate to invest part of the reserves for a longer investment horizon. This is because, as noted, the higher the level of the reserves, the bigger "cushion" there is to absorb losses. This "cushion" makes it possible to invest in more volatile assets, such as equities and corporate bonds, and to benefit in the long term from the risk premium inherent in such assets. In addition, the longer the investment horizon is, the more the relative risk from the investment in the risk assets declines, because of "mean reversion". In view of the growth in the level of the reserves in recent years, and in view of the establishment of the target of maximizing the return in terms of the currency benchmark, it was required to adjust the risk profile as well as the range of assets permitted to be invested in for that profile. Following are the main changes made in the risk constraints:

1) **Change in the maximum risk constraint**—the maximum risk level was increased from $CVaR_{5\%}$ of 475 basis points to $CVaR_{5\%}$ of 900 basis points.
2) **Change in investment limitations in risk assets**
   i. **Limitation on investment in equities**: the maximum share of investment in equities was increased from 17.5 percent to 27 percent of the total reserves.
   ii. **The limitation on the investment in bonds issued by corporations**: the investment in corporate bonds is limited to 15 percent of the total reserves and was kept unchanged. However, the possibility of investing in corporate bonds with a credit rating below BBB- was added, up to 5 percent of total reserves.
   iii. **The limitation on investment in risk assets**, which includes equities and corporate bonds, was increased from 25 percent to 35 percent of total reserves.

2. The risk level of the reserves

The maximum level of risk of the reserves portfolio (the risk profile) is determined by the Monetary Committee based on its assessment of the risk level that is appropriate for the reserves holding objectives, and is defined as the maximum loss in the reserves that the Committee is willing to accept without adversely affecting the attainment of the objectives for which they are held. The risk profile is determined in order to limit in advance the reserves' exposure to various financial risks—price risk, credit risk, currency risk, and liquidity risk.

The risk measure $CVaR_p$ (Conditional Value at Risk at a p probability level) is used to quantify the market risk (price risk and currency risk). It measures the risk in terms of the expected loss on the investment portfolio in a specific time period, for a given probability (p). It should be noted that CVaRp is a forward-looking (ex-ante) indicator, affected by changes in the portfolio holdings and the volatility of the portfolio assets, but is based on past levels of volatility.

In the guidelines, the Monetary Committee set the maximum level of risk for the reserves, so that given the worst 5 percent of possible investment outcomes, the average loss—the $CVaR_{5\%}$—would not exceed 900 basis points over a one-year horizon. This risk level was set with the goal of limiting the short-term risk and increasing the probability of covering the financing costs of the reserves in the long term. The Monetary Committee regularly evaluates the conditions under which the level of risk was set, and may change this level if material changes in these conditions occur.

At the beginning of every year, the Monetary Committee sets the level of risk (in terms of $CVaR_{5\%}$) used to determine the strategic asset allocation for that year, based on the expected macroeconomic and financial background conditions. As noted above, in April 2021 the Committee approved a revised version of the guidelines, including an increase of the maximum risk level $CVaR_{5\%}$ from 475 basis points to 900 basis points, and the strategic asset allocation for the year 2021 was set within the revised version of the guidelines. The Committee chose a risk level of approximately 600 basis points for setting the allocation for 2021.[8]

[8] The risk level in the reserves portfolio was increased to this level in practice after the new guidelines came into effect.

3. The basic benchmark, the strategic asset allocation, and the actual composition

Similar to other investors worldwide, the Bank of Israel manages the foreign exchange reserves portfolio using a **benchmark** as a reference point for measuring the performance of the investment decisions and risks taken by the portfolio manager. A benchmark is a hypothetical portfolio composed of various investable assets on the basis of known and fixed rules.

The **basic benchmark** represents a low-risk composition of investable assets that meets the goals of managing the reserves at a high level of liquidity. The currency composition of the basic benchmark is identical to the currency composition of the currency benchmark, and it includes short-duration government bonds in the currency benchmark currencies.

Within the revisions made to the guidelines in April 2021, the Monetary Committee revised the principles used to determine the currency benchmark composition, which is also the currency used to measure the holding rate of return on the foreign exchange reserves. Nonetheless, it was decided that the composition of the currency benchmark in 2021 would remain identical to the composition of the **numeraire**—a basket of currencies consisting of 3 currencies that, over the year, on average comprised 66.5 percent US dollar, 30.8 percent euro, and 2.7 percent pound sterling. The Monetary Committee decided to adopt, beginning in 2022, a broad currency benchmark that comprises seven main currencies in which reserves are held, in the following proportions: 61 percent US dollar, 20 percent euro, 5 percent pound sterling, 5 percent Japanese yen, 3.5 percent Australian dollar, 3.5 percent Canadian dollar, and 2 percent Chinese yuan. In early 2022, the broad currency benchmark will enter into effect as the risk-free currency composition and as the measurement currency and accordingly, the reserves portfolio will be gradually distributed over the currencies and assets in the currencies of the broad currency benchmark over the course of 2022.

The currency benchmark is a basket of currencies that is used, alongside the shekel, to measure the returns on the foreign currency reserves. As the holding rate of return on the reserves is also measured in terms of the currency benchmark, its composition is considered risk free from the perspective of the reserves portfolio managers. The currency benchmark's composition is determined by the Monetary Committee on the basis of the principles detailed in the guidelines (Appendix 2), and will be reviewed at least once a year and revised, subject to the approval of the Monetary Committee.

The annual strategic asset allocation process determines the composition of the reserves portfolio for the coming year. The strategic composition of the reserves portfolio is determined so there is an expected rate of return on the portfolio, subject to the desired risk level and the guidelines. The strategic asset allocation determines the main features of the reserves portfolio, including the currency composition, the asset composition, and the target duration for each currency.

In the context of the strategic asset allocation for 2021, the Committee decided to increase the proportion of investments in equities from 15 percent to 18 percent, and to maintain the allocation for corporate bonds at 6 percent, as in the previous year, with a currency distribution of two thirds in dollar-denominated corporate bonds and one third in euro-denominated corporate bonds. The Committee also decided to maintain the duration of the portfolio at 2 years and to close its investment in the currency basket (investment in six currencies, equally weighted, in the Czech Republic, Norway, Chile, China, Poland and the US, against the euro) (see Table 3).

Table 3
Strategic asset allocation for 2020 and 2021

	2020	2021
Government Bonds	**79.0%**	**76.0%**
Duration (Years)	**2.1**	**2.0**
USD	2.3	2.3
EURO	1.5	1.5
GBP	1.5	1.5
Currency Exposures	**3.0%**	**0.0%**
Corporate Bonds	**6.0%**	**6.0%**
US	4.0%	4.0%
Europe	2.0%	2.0%
Equities	**15.0%**	**18.0%**
US	8.8%	11.7%
Japan	1.2%	1.5%
France	1.4%	1.1%
Germany	1.3%	1.0%
UK	0.8%	0.9%
Canada	0.5%	0.6%
Switzerland	0.4%	0.5%
Australia	0.3%	0.4%
Hong Kong	0.3%	0.3%

Source: Bank of Israel

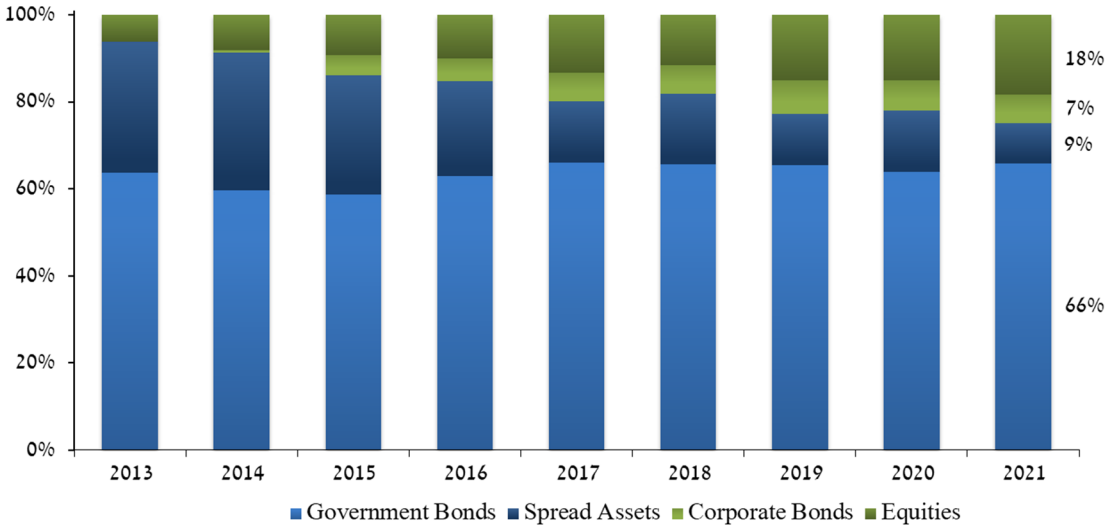
The Monetary Committee allows the Markets Department some degrees of freedom for investment of the reserves, so that the actual composition is likely to differ from that determined in the strategic asset allocation. The difference may be reflected in an investment with different weights of the risk assets, or with a different duration than in the allocation, an investment in government bonds of countries that are not included in the basic benchmark, or an investment in spread assets—debt instruments of multinational and public-sector issuers, or in investment in government bonds denominated in a currency different than the local currency of the issuing country. In all cases, the investment must meet the guidelines that define the permitted assets and issuers for investment, their minimum credit rating, and the limits on the proportion of the reserves invested in these assets and issuers (Appendix 2).

At the end of 2021, 66 percent of the reserves were invested in government-issued assets,[9] 9 percent in spread assets, 7 percent in corporate bonds, and 18 percent in equities (Figure 4).

Also at the end of 2021, excluding the equity assets in the reserves portfolio, 67 percent of the reserves portfolio was invested in AAA-rated bonds, 19 percent in AA-rated bonds, 10 percent in A-rated bonds, and 4 percent in BBB-rated bonds (Figure 5).

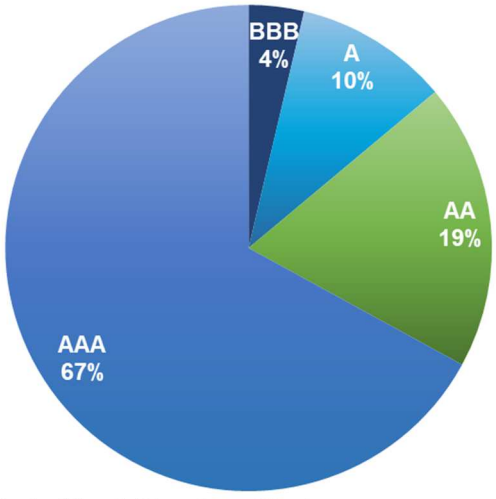
[9] Including deposits and current accounts in central banks that are subject to the same risks as government bonds.

Figure 4
The Distribution of the Reserves Portfolio by Assets, 2013–2021 (year-end)



Source: Bank of Israel.

Figure 5
The Distribution of the Reserves Portfolio (Excluding Equities) by Credit Rating, 2021
(year-end)



Source: Bank of Israel, Bloomberg, Moody's.

C. The Holding Rate of Return on the Reserves

1. Economic and financial background conditions

The beginning of the year was characterized by optimism regarding economic activity, due to the commencement of a global COVID-19 vaccination campaign in December 2020. Nonetheless, the pandemic continued to affect global economic activity in 2021, although to a smaller extent than in 2020. In 2021, new variants of the virus were discovered that spread rapidly across the world, leading to coronavirus surges and restrictions imposed by major countries. Still, the restrictions imposed following these surges were more moderate than the restrictions imposed in 2020, and as a result had a less damaging effect on the global economy in 2021. GDP gaps that opened up in 2020 decreased markedly, and global output increased by 5.9 percent in 2021. The strong momentum of growth this year affected all major economies.

As a result of the pandemic crisis, the global demand for industrial products rose sharply, and together with limited supply caused by the outbreaks of the virus, adversely affected global supply chains, resulting in significant excess demand. These factors, alongside a steep rise in energy prices, led to rising inflation that exceeded central bank targets in many countries. The rates and persistence of inflation, in contrast to preliminary estimates that price increases would not persist for a lengthy time, led to tighter monetary policies around the world. The rising inflation and inflation expectations, alongside the initiation of tighter monetary policies, led to a rise in government bond yields across the world (Figure 6).

Appendix 1 presents a more detailed analysis of the economic and financial environment in 2021.

Figure 6
Ten-year Government Bond Yields—US and Germany, 2001-2021

Source: Based on Bloomberg.

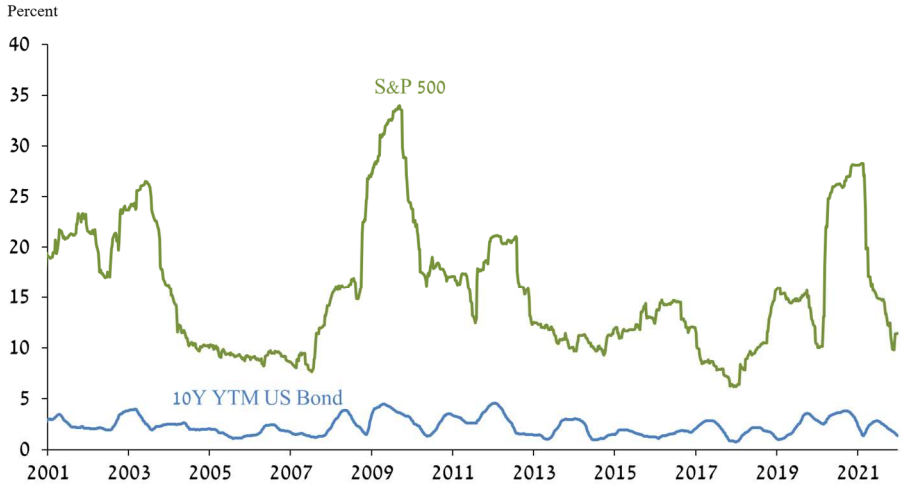
In 2021, equity indices across the globe showed double-digit increases in annual terms, as did the majority of the equity indices in which the reserves are invested (Figure 7 presents returns by country, in local currency). This increase occurred despite the rising yields in government bonds, against the backdrop of a significant improvement in corporate profitability compared to 2020 and due to the absence of investment alternatives, because real returns remained low. Equities volatility (measured by the standard deviation) declined and returned to pre-pandemic levels (Figure 8).

Figure 7
Holding Rates of Return[1] and Standard Deviation for Indices[2] of the Main Assets in the Reserves Portfolio, 2021

		Return in Local Currency	Standard Deviation in Annual Terms
Equities	MSCI US IMI Index	26.1%	13.8%
	MSCI Switzerland Index	23.9%	8.5%
	MSCI France IMI Index	29.1%	12.7%
	MSCI German IMI Index	14.1%	12.0%
	MSCI Australia IMI Index	17.5%	9.3%
	MSCI Canada IMI Index	25.4%	11.1%
	MSCI Japan Index	13.0%	14.9%
	MSCI UK Index	18.7%	10.7%
	MSCI Hong Kong IMI Index	-2.8%	14.3%
Euro Bonds	EUR Govt 0-1Y	-0.6%	0.1%
	Dutch Gov 1-5Y	-1.2%	0.7%
	France Gov 1-5Y	-1.0%	0.8%
	Germany Gov 1-5Y	-1.0%	0.7%
	EUR Govt 1-5Y	-0.1%	0.9%
	U.K. Gilts 1-5Y	-1.9%	1.5%
US Bonds	US 0-1Y	0.1%	0.0%
	U.S. Treasury 1-10Y	-1.7%	1.6%
	US TIPS 1-10Y	5.7%	3.1%
	US Corporate 1-5Y	-0.3%	1.0%

[1] Includes interest, dividends, and capital gains/losses.
[2] For equities the indices are MSCI indices.
Source: Based on Bloomberg.

Figure 8
Standard Deviation[1] of the S&P 500 Index and the 10-Year US Treasury Notes, 2001-2021

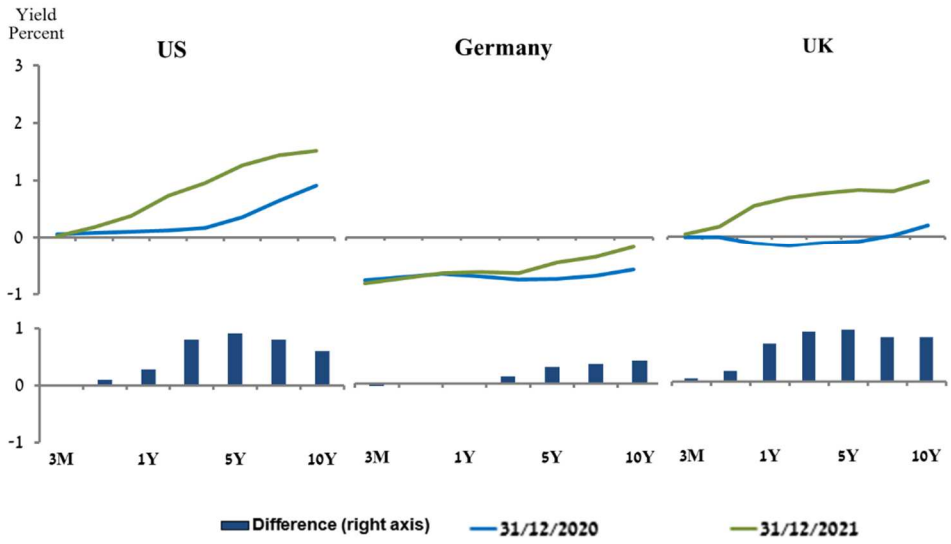


[1] Weekly standard deviation of the return on the S&P500 Index and of the yield to maturity on 10-year US Treasury Notes, in annual terms, 1-year moving average.

Source: Based on Bloomberg.

The increase in inflation and inflation expectations, alongside tighter monetary policy measures as noted, led to an increase in government bond yields worldwide. Yields to maturity rose significantly, especially for longer terms to maturity, resulting in a steepening of yield curves. Rising yields generated capital losses and reduced the return on the reserves portfolio (Figure 9).

Figure 9
Yield Curves and Changes in Them—Government Bonds of US, Germany, and UK, 2021



Source: Based on Bloomberg.

2. Return on the reserves portfolio in currency benchmark terms

In terms of the currency benchmark, the rate of return on the reserves portfolio in 2021 was 2.9 percent, while the return on the basic benchmark was negative, unlike the past, and reached -0.3 percent (Table 4). The return was achieved mainly due to the increase in equities prices, and was partially offset by the increase in yields to maturity of government bonds, in which the vast majority of the reserves is invested (Figure 7). In 2021, the portfolio's volatility, which is measured by the weekly standard deviation, declined compared to its record high in 2020 and reached 1.8 percent. This level approximates the volatility levels in the years preceding the COVID-19 crisis despite the increase in the share of risk assets in the portfolio.

The active management return this year exceeded the basic benchmark by 3.2 percent (for further discussion of the contribution of the active management, see Chapter D).

Table 4

Reserves Portfolio Performance vs. the Basic Benchmark[10], 2012–2021

(Percent, in annual currency benchmark terms, the numbers in parentheses is the weekly standard deviation in annual terms)

	Performance		Excess Return
	(1) Actual Portfolio	(2) Basic Benchmark	(1)-(2) Total
2012	**1.59** (0.57)	**0.42** (0.17)	**1.17** (0.52)
2013	**0.87** (0.80)	**0.07** (0.16)	**0.80** (0.74)
2014	**1.28** (0.85)	**0.22** (0.09)	**1.06** (0.88)
2015	**0.64** (1.29)	**0.10** (0.12)	**0.54** (1.29)
2016	**1.56** (1.33)	**0.21** (0.13)	**1.35** (1.33)
2017	**3.03** (0.80)	**0.30** (0.10)	**2.73** (0.77)
2018	**0.18** (1.67)	**1.06** (0.16)	**-0.87** (1.69)
2019	**6.12** (1.42)	**1.54** (0.19)	**4.59** (1.45)
2020	**4.01** (3.35)	**0.61** (0.25)	**3.40** (3.44)
2021	**2.95** (1.76)	**-0.26** (0.08)	**3.21** (1.75)

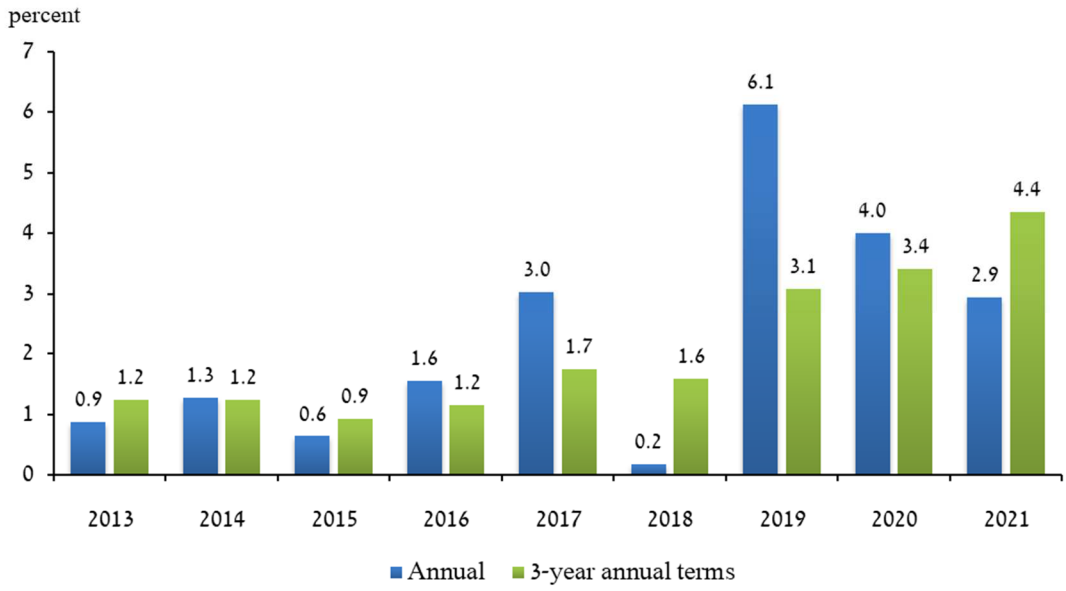
Source: Bank of Israel.

[10] In March 2014, the basic benchmark's duration was shortened from 10 months to 6 months, and acted to increase the spread between the benchmark return and the reserves portfolio return.

The higher the level of the reserves, the smaller the relative share of the reserves required to be available for immediate use in case of an emergency, and therefore part of the reserves can and should be invested with a longer term investment horizon, essentially by increasing the investment in risk assets. The average multiyear return on risk assets, in which an increasing proportion of the reserves portfolio has been invested in recent years, is expected to be positive. Nonetheless, risk assets are inherently volatile, and losses can be expected in certain years, especially during a crisis. **Three-year measurement shows clearly that the reserves portfolio's return is positive over time and is less volatile compared to annual measurement** (Figure 10).

The three-year average holding rate of return on the reserves portfolio increased this year and reached 4.4 percent in terms of the currency benchmark (Figure 10).

Figure 10
The Reserves Portfolio Return, Annual and 3-Year Period, 2013-2021
(Annual, in terms of the currency benchmark)



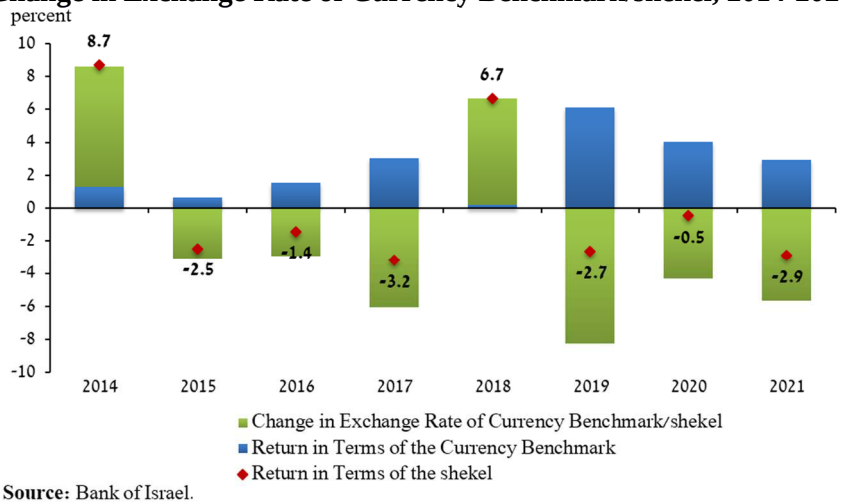
Source: Bank of Israel.

3. Return on the reserves portfolio in shekel terms

The return on the reserves in shekel terms is the return in currency benchmark terms plus the gains or losses from the currency exposure against the shekel. Due to the new version of the guidelines, which set a target for the return in shekel terms, such that it would, in the long term, at least cover the financing costs[11] of holdings the reserves, the holding rate of return on the reserves portfolio is also reported in shekels.

In 2021, the rate of return on the reserves portfolio in shekel terms was negative, at -2.9 percent (Figure 11) due to a loss of 5.7 percent from the currency exposure vis-à-vis the shekel.

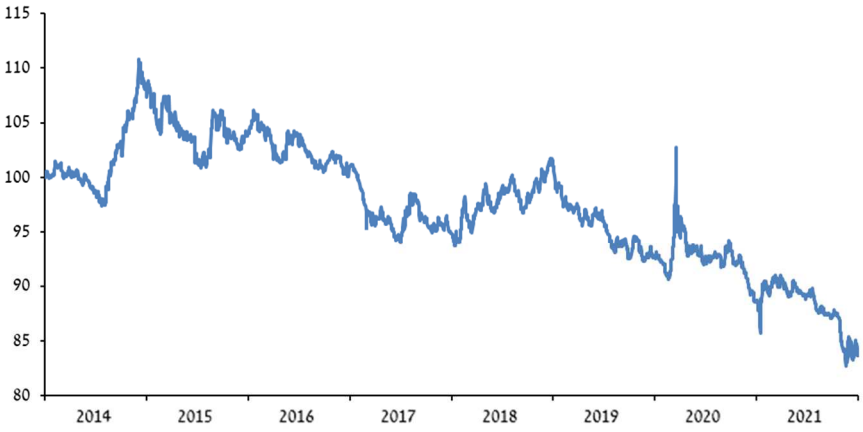
Figure 11
The Reserves Portfolio Return in Shekel Terms, in Currency Benchmark Terms and the Change in Exchange Rate of Currency Benchmark/shekel, 2014-2021



Source: Bank of Israel.

In general, due to the appreciation of the shekel against the currencies that comprise the currency benchmark (Figure 12) in most years since 2014, the return in shekel terms has been significantly lower than the return in currency benchmark terms and was even negative in some years.

Figure 12
The Change in Exchange Rate of Currency Benchmark vs. the Shekel, 2014-2021 (100=1.1.2014)

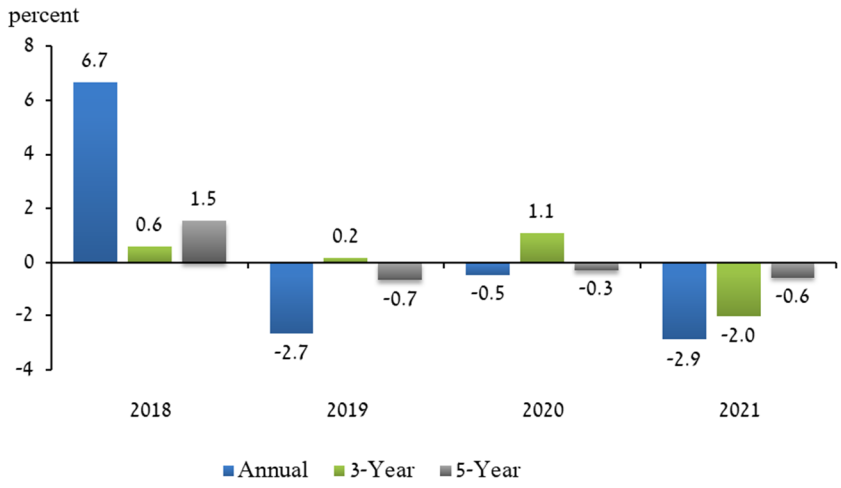


Source: Bank of Israel.

[11] The financing costs of holding the reserves is the difference between the cost of raising the capital in shekels required for holding the reserves, and the return of the foreign exchange reserves in terms of the currency benchmark, with the addition of the gain or loss from currency exposure against the shekel (the absorption cost).

From a long-term perspective, the five-year average rate of return on the reserves portfolio in shekel terms is -0.6 percent, and the three-year average rate of return is -2 percent. **Even when the rate of return is measured in shekel terms, it is clear that the rate of return on the reserves portfolio increases as the measurement period is extended (or is not as low) and is less volatile compared to a yearly measurement** (Figure 13).

Figure 13
The Return in Shekel Terms– Annual, 3-Year and 5-Year, 2018-2021
(Annual terms)



Source: Bank of Israel.

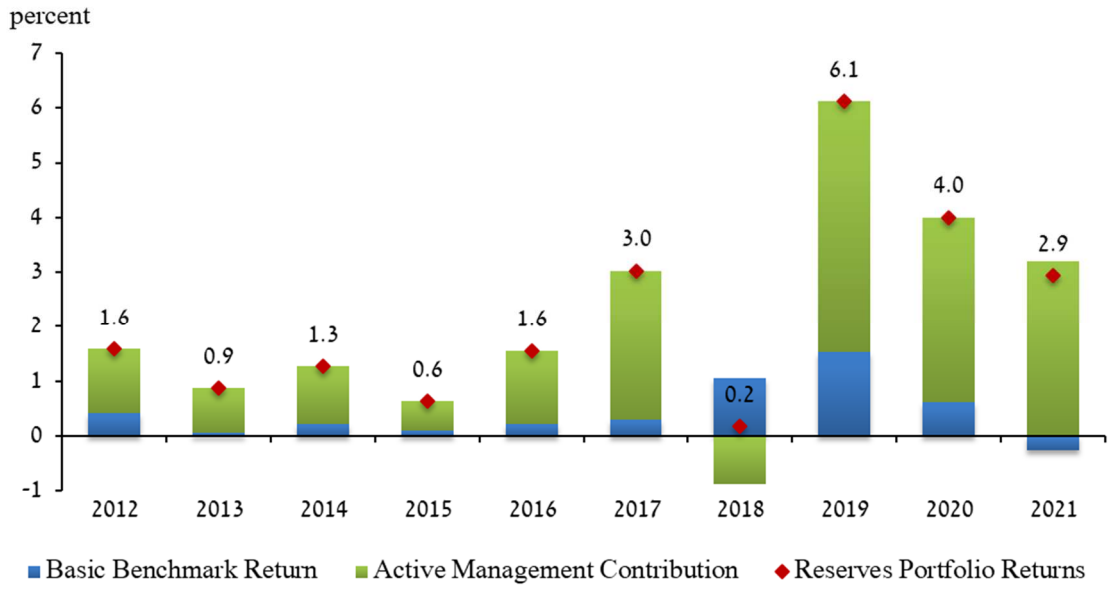
D. Active Management Contribution—Excess Return over the Basic Benchmark

The contribution of active management is mainly the contribution of the decisions to invest in additional countries and in assets not included in the basic benchmark, or with a different weight, duration, and diversification compared to the basic benchmark. Active management decisions may be classified according to the following types of risk: duration, equities, spread assets, corporate bonds, currency exposures and other risks.

Since 2012, the active management contribution, which is the excess return over the basic benchmark, has had the greatest effect on the return on the reserves portfolio, while the rate of return of the basic benchmark has been relatively low. Increasing the risk components in the portfolio increases the long-term expected return due to the **risk premium (**the return on risk assets in excess of the risk-free interest rate). At the same time, volatility is also expected to increase due to the higher volatility of the risk assets. Increased volatility is, to some extent, offset by the portfolio's diversification across asset types.

This year, active management increased the rate of return on the reserves portfolio by 3.2 percent in currency benchmark terms (Figure 14). Investment of the reserves in risk assets was initiated in 2012 through investment in equities, and continued through investments in corporate bonds, which commenced at the end of 2014. Over recent years, there has been a gradual increase of risk assets in the portfolio. Following the revision of the guidelines, which permit an additional increase in risk assets, their weight in the reserves portfolio was further increased this year to 25 percent of the reserves portfolio (Figure 4). The return in recent years clearly reflects the impact of the increasing investment in risk assets in the reserves portfolio, which increased the intermediate-term rate of return at the cost of increased short-term volatility.

Figure 14
The Reserves Portfolio Return, the Basic Benchmark Return, and the Active Management Contribution, 2012–2021
(in terms of the currency benchmark)



Source: Bank of Israel.

Table 5
Breakdown of active management return contribution to its components, 2019-2021
(Basis points, in terms of the currency benchmark, annual)

	2019	2020	2021
Equities	340	181	357
Duration & Diversification	92	152	-57
Currency and asset exposures	-1	-11	10
Corporate bonds	17	14	6
Spread assets	11	4	5
Total	**459**	**340**	**321**

Source: Bank of Israel.

This year, equities made the greatest contribution, totaling 357 basis points. In contrast, duration made a notable negative contribution of 57 basis points, mostly due to the sharp rise in yields in annual terms this year (Table 5).

1. Equities (357 basis points)

The reserves' investment in equities began in 2012, and it tracks local equity indices in investment markets. The investment is diversified in accordance with a broad equity index of advanced economies, based on the MSCI Developed Markets index.

The contribution of investment in equities was 357 basis points this year, the most significant contribution of all risk components (Table 5). The investment in equities reached a record high in 2021, after investment in equities was increased to 18 percent in the Committee's benchmark, which was made possible by the revised guidelines that set the maximum share of investment in equities at 27 percent. The positive contribution was recorded after the majority of the equity markets in which the reserves are invested (excluding Hong Kong) rose by double digits in annual terms (Table 6). Volatility in 2021 was lower compared to the previous year and was similar to the long-term volatility of the equities (Figure 8).

The largest positive contribution was recorded in the US. The contribution is the outcome of the share of the investment in a given market and the change in the equity index in that market. As of the end of 2021, the major share of investment in equities was in US equities (approximately 12.5 percent), which, together with the 26 percent increase in that index, contributed approximately 252 basis points (Table 6). In the majority of the other countries, the contribution was positive and considerable relative to their relatively small proportion in the portfolio. Of all the equities markets in which the reserves are invested, the equities market in Hong Kong is the only one that recorded a decline, of approximately 3 percent, mainly due to the index's high exposure to the Chinese market, which experienced a significant increase in risk this year as the result of regulatory tightening in diverse sectors, alongside concerns of a real estate crisis.

Table 6
Shares of equities out of total reserves, by country and the contribution to the reserves portfolio in 2021

	Holding Percentage		Index Return 2021 (%)	Equity Contribution (b.p)
	End of 2020	End of 2021		
US	8.9	12.5	26.1	252
Japan	1.3	1.3	13.0	13
France	1.4	1.1	29.1	33
Germany	1.5	0.9	14.1	20
UK	0.5	0.8	18.7	11
Canada	0.4	0.6	25.4	12
Switzerland	0.4	0.5	23.9	10
Australia	0.3	0.4	17.5	7
Hong Kong	0.2	0.3	-2.8	-1
Total	**15.0**	**18.3**	**24.4**	**357**

Source: Bank of Israel.

2. Duration and diversification (-57 basis points)

The duration of a fixed-income portfolio is an accepted measure of the portfolio's interest rate risk. The contribution of duration and asset diversification is a function of the decision to invest the reserves at a duration that differs from that of the basic benchmark, and the decision to disperse the assets differently along the curve compared with the basic benchmark. A portfolio with a longer duration usually benefits from higher current income at a higher interest rate compared to the basic benchmark, and generates capital gains when yields decline, but increases the portfolio's volatility and leads to capital losses when yields rise. The Monetary Committee decided at the beginning of the year to retain a portfolio duration of 24.6 months, the same level as the previous year.

This year, due to the increase in yields to maturity, duration and diversification made a negative contribution of 57 basis points. This followed an extended period of declining yields, which generated a positive contribution of duration. This year, the portfolio's duration averaged 22.6 months, compared with the duration of the basic benchmark, which was 6 months. As noted, when yields rise, which was the case this year, capital losses are generated. Most of the loss (47 basis points) derived mainly from the rise in the yield of the dollar curve, mainly in longer terms to maturity.

3. Currency exposures (10 basis points)

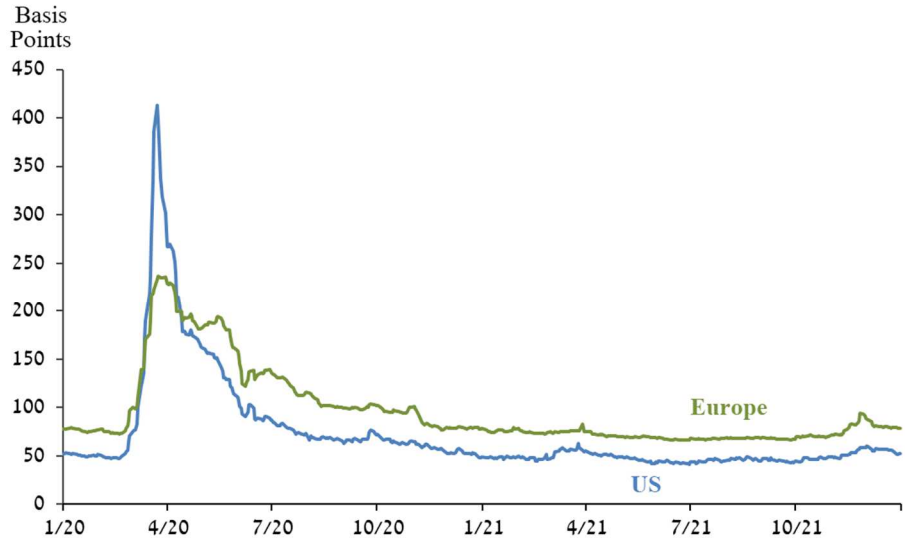
Currency exposures contributed 10 basis points. Currency exposures are due to investment in currencies that are not included in the composition of the currency benchmark. In early 2020, the Monetary Committee approved a 3 percent investment in a currency basket comprised of six currencies (equally weighted investments in Czech Republic, Norway, Chile, China, Poland, and the United States against the euro) in an effort to mitigate the effects of the negative income rates in Europe. The Committee decided to close this investment in early 2021, due to the decline in yields of bonds denominated in these currencies. This exposure, which was at the beginning of the year, together with additional currency exposures created in the course of 2021, within the degrees of freedom of the Markets Department, made a positive contribution of approximately 10 basis points.

4. Corporate bonds (6 basis points)

Exposure to corporate bonds contributed 6 basis points. The main spread risk in the reserves portfolio stems from the investment in investment-grade corporate bonds traded in the US and European markets. The investment is made by the Bank's investment managers and by external managers, relative to a well-known benchmark with broad coverage of dollar-denominated corporate bonds traded in the US and euro-denominated corporate bonds traded in the European markets. In early 2021, the Monetary Committee retained the 6 percent allocation to corporate bonds. In practice, within the degrees of freedom, the average investment rate in corporate bonds in 2021 was 6.8 percent.

In 2021, the yield spread between corporate and government bonds remained relatively small, at approximately 50 basis points in dollar-denominated bonds and approximately 70 basis points in euro-denominated bonds (Figure 15). This spread was the main source of the positive contribution of corporate bonds.

Figure 15
The Spread between Corporate Bonds and Government Bonds in the US 0–5 Year Benchmark and the Europe 1–5 Year Benchmark, 2020–2021



Source: Based on Bloomberg.

5. Spread assets (5 basis points)

The total exposure to spread assets contributed 5 basis points. Spread assets are debt instruments that are not included in the basic benchmark[12], such as multinational and public-sector issuers, and government bonds denominated in a different currency than the local currency of the issuing country. These assets generate a return that exceeds government bond yields with a similar term to maturity. The spread mainly reflects a credit risk premium relative to government bonds, and varies as a function of changes in the asset's credit risk.

[12] Excluding corporate bonds, which are discussed separately in Section 4 of this chapter.

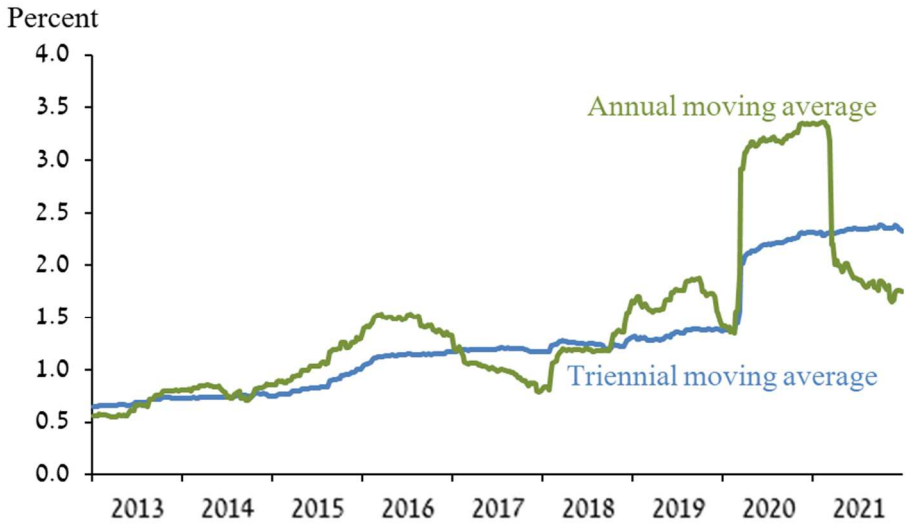
E. Risk and Risk-Adjusted Returns

1. Volatility of the reserves portfolio, active management, and $CVaR_{5\%}$ measure

The risk in the reserves portfolio increased in recent years due to the increased share of risk assets as part of the active management. The volatility in financial markets in 2021 was, however, lower than in the previous year due to the COVID-19 crisis.

Volatility—measured by the standard deviation of the rate of return on the portfolio over a one-year period—is affected mainly by volatility in the markets. In contrast, volatility that is measured by the standard deviation calculated over a three-year period is more strongly affected by the weight of risk assets in the portfolio (Figure 16). As noted, in 2021, the standard deviation of the return on the portfolio, which is a measure of volatility, was low compared to the previous year, due to the decline in volatility of the financial assets, notwithstanding the increased weight of equities in the portfolio.

Figure 16
Standard Deviation of the Reserves Portfolio[1], 2013–2021



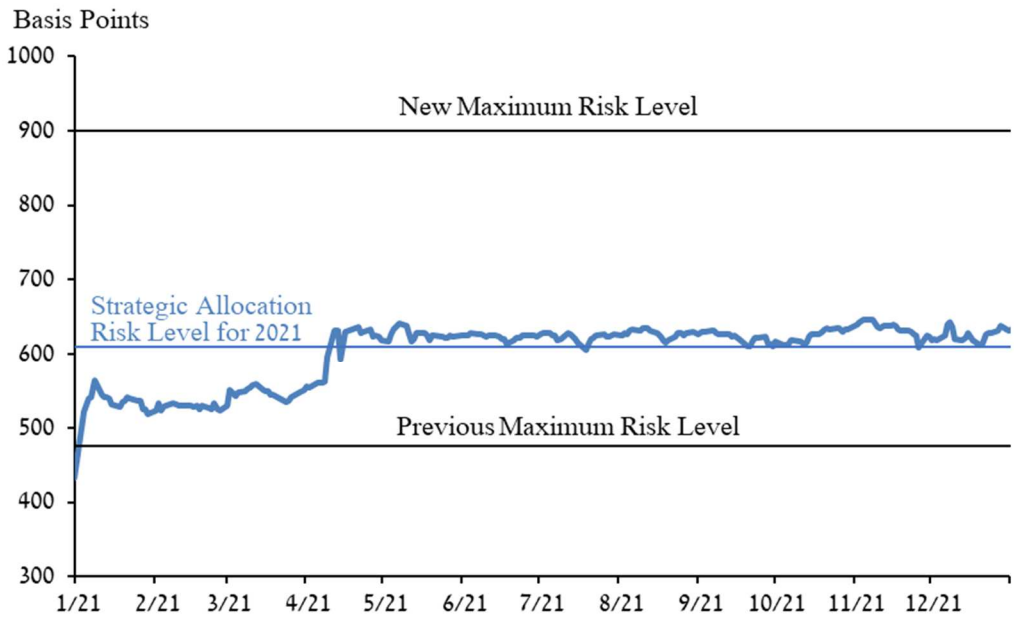
[1]Standard deviation of weekly returns in annual terms.
Source: Bank of Israel.

In its guidelines, the Monetary Committee establishes the maximum risk level of the reserves for a one-year horizon, in terms of $CVaR_{5\%}$. In April 2021, the Monetary Committee approved a new version of the investment policy guidelines, in which the maximum permitted $CVaR_{5\%}$ was raised from 475 basis points to 900 basis points, which means that given the worst 5 percent of possible outcomes, the average loss—the $CVaR_{5\%}$—would not exceed 900 basis points over a one-year horizon.

In addition to determining the maximum level of this measure, at the beginning of each year the Monetary Committee determines, based on its forecast of macroeconomic and financial background conditions, the risk level (in terms of the $CVaR_{5\%}$) to be used for setting the strategic asset allocation for that year. At the beginning of the year, a passive breach occurred from the previous maximum risk level that had been approved by the Committee, in view of the intention to increase the maximum risk level.

The Committee chose a risk level of approximately 600 basis points for the allocation in 2021, within the revised version of the guidelines. Increasing the risk level of the reserves portfolio by increasing the investment in equities was performed only after the new guidelines came into effect. The risk level of the portfolio is affected both by the volatility of the financial assets and the share of risk assets in the portfolio, and is monitored and reviewed regularly over the year. In 2021, the $CVaR_{5\%}$ was at a level close to the level set in the strategic asset allocation (Figure 17).

Figure 17
$CVaR_{5\%}$ Measure of the Reserve Portfolio, 2021



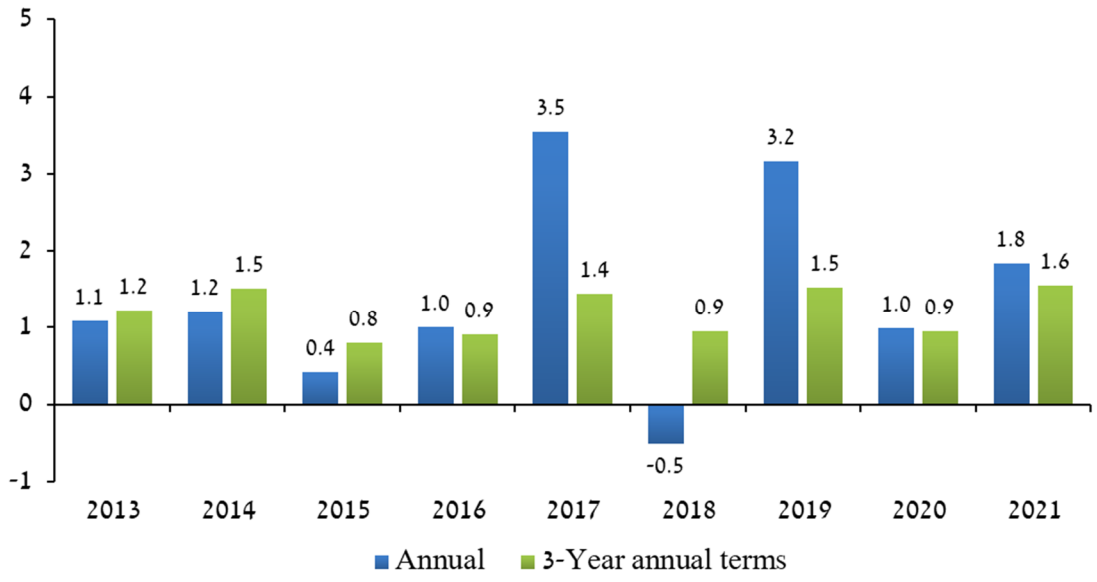
Source: Bank of Israel, data from Aladdin.

2. The risk-adjusted contribution of active management

The **Information Ratio (IR)** measures the **active management** of the portfolio manager (the excess returns) for the excess risk assumed, and indicates the degree of consistency in the manager's ability to generate excess returns for higher levels of risk. The index is calculated as the ratio of the contribution of active management to its standard deviation.

The risk-adjusted return, measured by the IR, increased this year due to the decline in the volatility of the active management, which originates from the decline in volatility in the markets (Figure 18). When measured over 3 years, the risk-adjusted return is much less volatile.

Figure 18
The Ratio of Active Management Contribution to its Standard Deviation (the Information Ratio)[13], annual and 3-year measurement, 2013–2021



Source: Bank of Israel

[13] The risk-adjusted return, measured by the IR index, is not informative when the value of the return is negative.

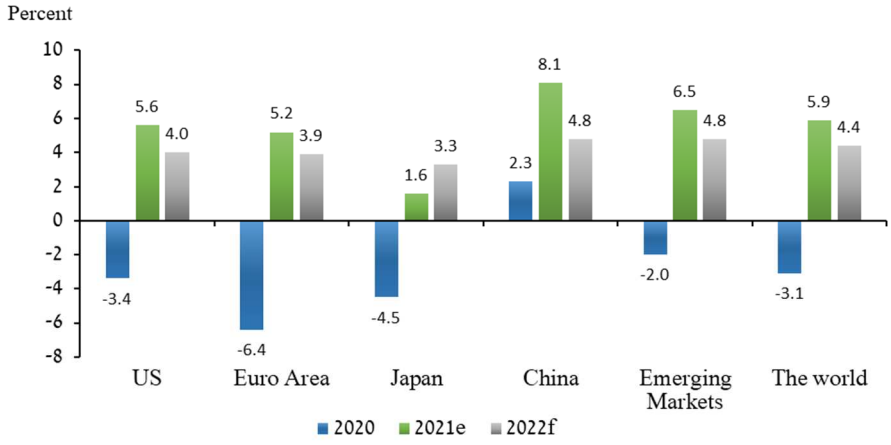
Appendices

Appendix 1: The Global Economic and Financial Environment

In early 2021, the global economy was characterized by optimism regarding economic activity against the backdrop of the initiation of the global COVID-19 vaccination campaign in December 2020. Nonetheless, the pandemic continued to affect global economic activity in 2021, albeit less strongly compared to its impact in 2020. In 2021, new variants of the virus were discovered and these spread rapidly across the globe, leading to surges of morbidity and restrictions in the major economies. The most significant of these variants was the Delta variant, which began to spread in December 2020, and the Omicron variant, with a higher infection rate compared to the Delta variant, and which was discovered in November 2021. The limitations imposed following these waves were more moderate than the limitations that had been imposed in 2020, due to the rise in vaccination rates, which helped to reduce the scope of hospitalizations and mortality, and improved the ability to sustain economic activity alongside the pandemic. As a result, in 2021 the adverse effects on the global economy were more limited compared to 2020.

According to the IMF[14], in 2021 global output rose by 5.9 percent, after contracting by 3.1 percent in 2020. Strong growth in the past year characterized all major economies (Figure A-1). According to IMF data, the global economy is expected to grow by 4.4 percent next year.

Figure A-1
Annual Growth, by Major Countries/Blocs



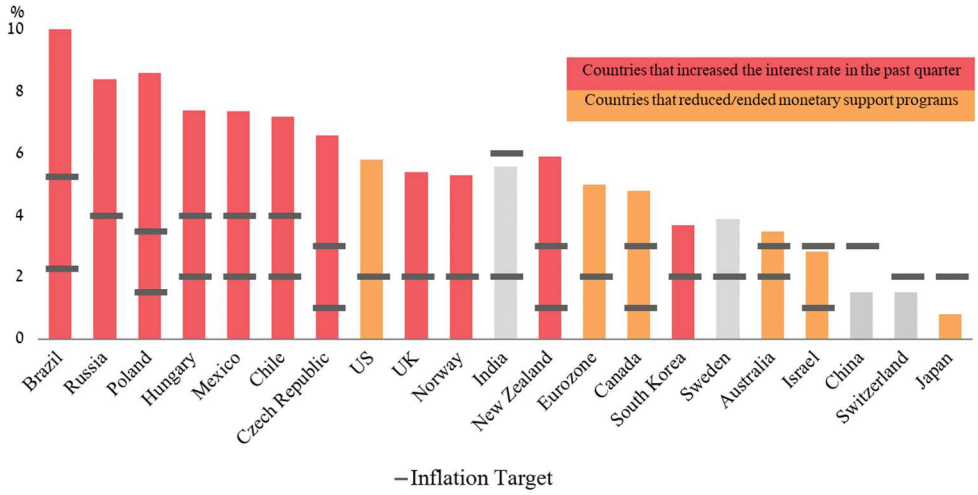
Source: IMF. 2020 actual data, 2021 estimated data, 2022 forecast.

The sharp rise in global demand for industrial products, together with limited supply caused by the outbreaks of the virus, led to difficulties in global supply chains and led to significant excess demand. These factors, alongside a steep rise in energy prices, led to rising inflation that exceeded central bank targets in many countries. These deviations (Figure A-2) and the continuation of inflation in contrast to initial estimates of price increases not lasting for long, led to tighter monetary policies around the world, especially in emerging economies (Figure A-3). In the US,

[14] Growth data are based on IMF estimates in World Economic Outlook Update, January 2022.

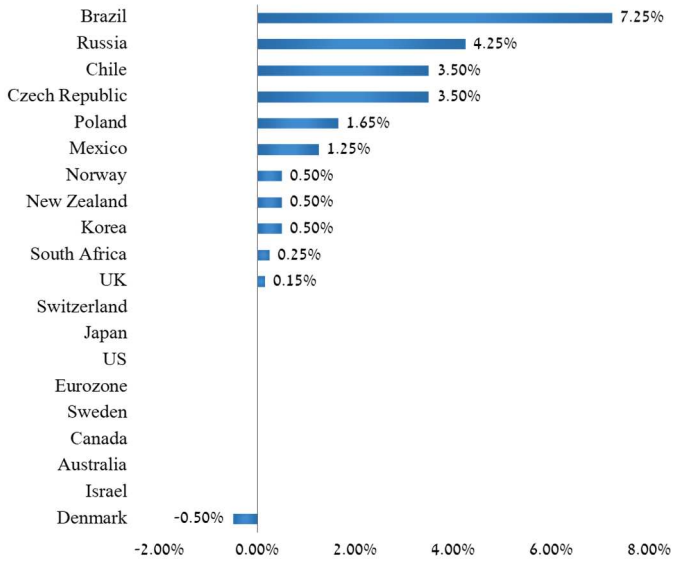
the Federal Reserve began to reduce its monetary support program toward the end of the year and signaled that the next year would see rising interest rates and a reduced Federal Reserve balance sheet. In the eurozone, the European Central Bank (ECB) announced in December that the Pandemic Emergency Purchase Program (PEPP) would end in March 2022.

Figure A-2
Inflation in Major Economies, December 2021



Source: Based on Bloomberg.

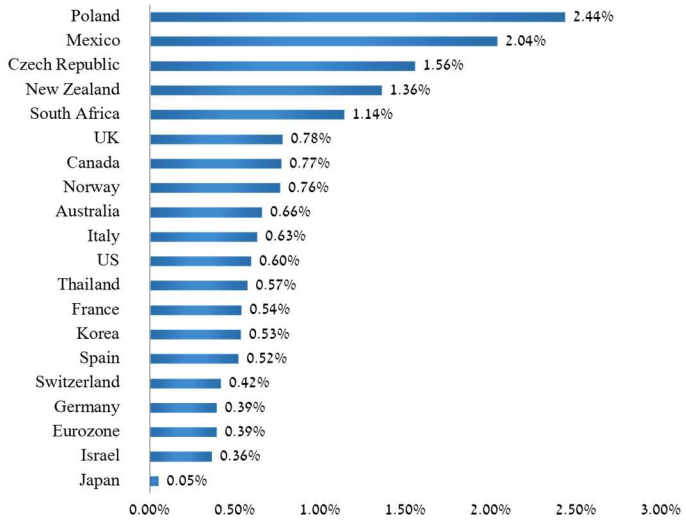
Figure A-3
Change in Monetary Interest Rates in Major Economies in 2021 (basis points)



Source: Based on Bloomberg.

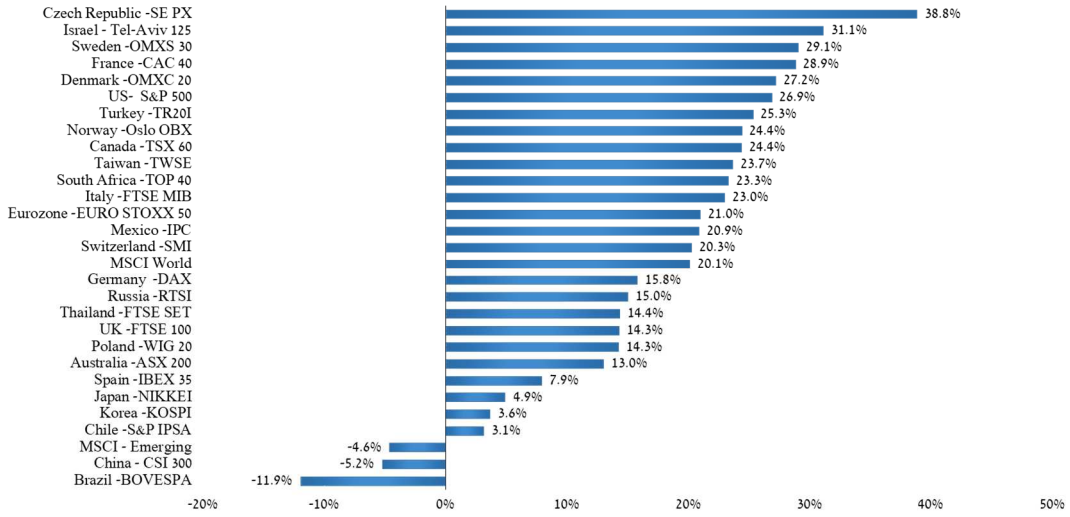
Rising inflation and inflation expectations, alongside tighter monetary policies, led to an increase in government bond yields across the globe (Figure A-4). Despite the rise in nominal yields, and against the backdrop of a sharp rise in corporate profits due to improved economic activity and low real interest rates, equities indices across the globe showed double-digit gains: the MSCI World index increased by more than 20 percent this year (Figure A-5), after a 14 percent increase in 2020. The yield spread in corporate bonds remained small and are close to their pre-pandemic levels.

Figure A-4
Change in Yield to Maturity on 10-Year Government Bonds in Major Economies in 2021



Source: Based on Bloomberg.

Figure A-5
Equity Returns in Major Economies in Local Currency Terms, 2021



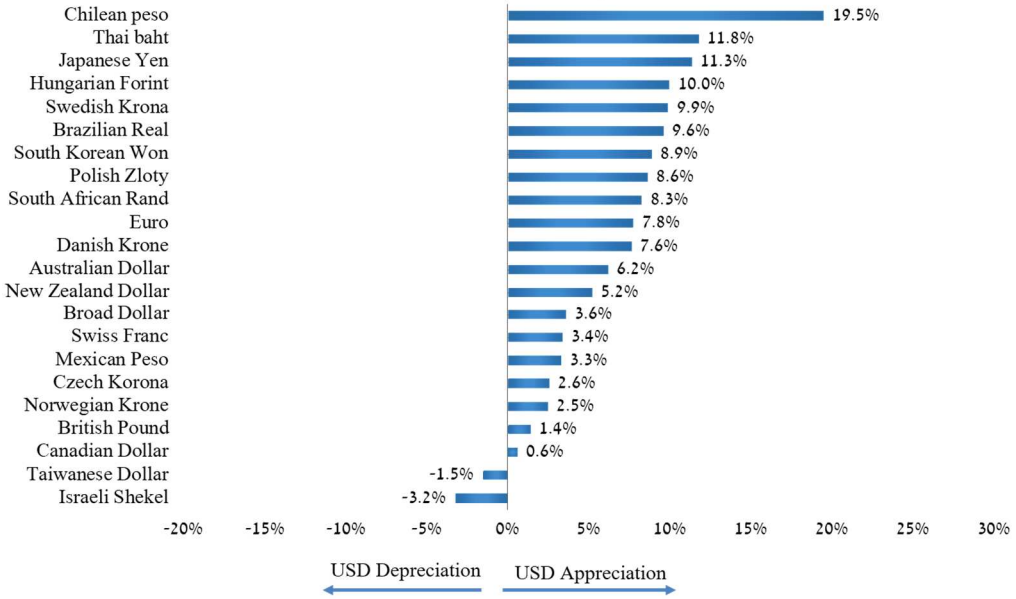
Source: Based on Bloomberg.

In the US, the rapid recovery from the crisis continued, and real GDP already exceeded its pre-crisis level of activity in the second quarter, and by the end of the year even reached a level very close to the pre-crisis growth path. During 2021, the economy grew, based on IMF data, by 5.6 percent, after negative growth of 3.4 percent in 2020. During the past year, economic activity was supported by very accommodative monetary policy by the US Federal Reserve, and continued fiscal aid, following the significant aid programs in 2020. The improvement in economic activity and the increase in inflation brought the Fed close to meeting its targets, the unemployment rate

at year end was 3.9 percent, a decline of 2.8 percentage points during 2021, and very close to before the crisis—3.5 percent. In December 2021 the annual inflation[15] rate was 5.8 percent, above the Fed's target.

The rapid recovery of the US relative to the rest of the world and the outperformance of the domestic equity market supported the strengthening of the dollar (Figure A-6), which increased by 3.6 percent in broad dollar terms during 2021.

Figure A-6
Performance of the Dollar vs. Major Currencies, 2021



Source: Based on Bloomberg.

In the eurozone, based on IMF data, GDP grew by 5.2 percent in 2021, after contracting by 6.4 percent during 2020. In the beginning of 2022, GDP is expected to be 1.6 percent lower than the level in 2019. The adverse impact in 2020 on countries in southern Europe was bigger than in the rest of the eurozone, among other things due to the relatively high share of the services sector in GDP. Accordingly, the recovery this year was stronger in those countries. For example, in Italy the economy grew in 2021 by 6.2 percent, after contracting by 8.9 percent in 2020, and in Spain the economy grew in 2021 by 4.9 percent, after contracting by 10.8 percent in 2020. In Germany the economy grew by 2.7 percent in 2021, after contraction of 4.6 percent in 2020. Activity in the country is supported by an in increase in global demand for manufacturing products, but difficulties in production chains and a shortage of chips are weighing on activity in the automobile industry, which is a major export industry of the country. Annual inflation in the eurozone increased sharply during the year and was 5 percent as of December 2021. The main contribution—about 2.5 percent—to inflation was from the energy component.

Despite the improvement in economic activity and the increase in inflation, the ECB is notable for dovishness relative to other central banks.

[15] In terms of Personal Consumption Expenditure (PCE).

In China, the economic recovery continued, with growth at a rapid pace of 8.1 percent in 2021, after it had been one of the only countries with positive growth in 2020 (2.3 percent). However, during the year there was some moderation in the pace of expansion of activity, against the background of a shortage in energy products, among other things due to an initiated suspension of coal mines, with the goal of complying with pollution emission targets, a slowdown in real estate market activity against the background of difficulties at several large real estate companies, and a decline in the growth rate of private consumption. In response to the slowdown, the central bank lowered the reserve ratio and the 1-year loan prime rate (LPR), and acted to depreciate the yuan by increasing the foreign exchange reserve ratio. In parallel, the bank worked to moderate the risks in the real estate market, among other things by keeping the 5-year LPR unchanged, alongside support in the purchase of real estate projects from companies in difficulties by stronger companies. The government worked during the year to strengthen the regulation on several sectors, including the technology sector and private education. This contributed to underperformance of the domestic equities market during the year (Figure A-5 above).

Appendix 2: Foreign Exchange Reserves: Investment Policy Guidelines[16]

In effect from April 7, 2021

In accordance with Section 40(b) of the Bank of Israel Law, 5770-2010 (hereinafter, "the Law"), the Monetary Committee is to establish the guidelines for the investment policy of the foreign exchange reserves.

1. Basic guidelines derived from the goals of holding the reserves

The investment policy of the reserves portfolio is based on the main goal of achieving the Bank of Israel's objectives and proper fulfillment of its functions as they are detailed in the Bank of Israel Law. Subject to that, the investment policy is also based on the following goals:

a) Achieving a return in shekel terms that, in the long term, will cover at least the financing cost of holding the reserves[17];
b) Maximizing the holding rate of return in the medium term, in terms of the currency benchmark (see 3. below) and within the framework of the risk profile (see 4. below), subject to attaining goal (c) below;
c) Managing the reserves with a high level of liquidity: A large part of the reserves are to be invested in assets that can be liquidated rapidly at short notice and without negatively impacting their value. The precise level of liquidity is to be decreased to the extent that the ratio of the actual level of reserves relative to the adequate level is high (5(f) below).

2. The division of work between the Monetary Committee and the Markets Department

In implementing Section 40(b) of the Law, the Committee shall make a distinction between establishing the guidelines and periodic monitoring, and setting the detailed instructions for the day to day management of the portfolio.

The Monetary Committee will set the guidelines, in consultation with the Minister of Finance as established by law, will update the guidelines to the extent necessary, and will monitor the implementation of the investment policy by the Markets Department.

The Markets Department will implement the investment policy, within the framework of degrees of freedom which will be set periodically by the Monetary Committee, and will report to the Monetary Committee on a quarterly basis on the implementation of the policy: developments in international markets and their impact on the management of the reserves, the investment decisions reached by the Department, the portfolio's rate of return, and the financial and other risks to which the portfolio is exposed.

The Markets Department will advise the Monetary Committee on fulfilling its functions, through position papers and suggestions for discussion in the Committee.

The Monetary Committee will approve and update as needed the division of authorities regarding the investment policy of the foreign exchange reserves.

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[16] The characteristics of the reserves portfolio are reported to the public in an annual report published on the Bank of Israel website.

[17] The financing cost of holding the reserves is the gap between the cost of raising the capital in shekels required for holding the reserves and the return of the foreign exchange reserves in terms of the currency benchmark with the addition of the gain or loss from the currency exposure vis-à-vis the shekel.

3. The measurement of the holding rate of return on the foreign exchange reserves, the currency benchmark and the principles for its determination

The holding rate of return on the reserves shall be measured and reported in Monetary Committee reports in terms of the currency benchmark and in shekel terms. The currency benchmark is a basket of currencies that will be used, in addition to the shekel, for measuring the rate of return on the foreign exchange reserves. As the rate of return on the foreign exchange reserves will also be measured in terms of the currency benchmark, its composition will be defined as the risk-free currency composition for the reserves portfolio managers.

The currency benchmark will be set by the Committee based on the following principles:

(a) Diversification: The currency diversification of the currency benchmark contributes to reducing exchange rate risk vis-à-vis the shekel in the Bank's balance sheet and encourages investment diversification;

(b) Stability: The principle of stability is important both for asset allocation as well as for currency allocation. Given that the reserves are held for the long term, frequent or sharp changes in the currency weights in the benchmark currency, which will lead as well to changes in the weight of the assets in those currencies, are liable to lead to a loss in the long term. Therefore, the stability of the composition of the currency benchmark should be maintained and frequent or sharp changes in it should be avoided;

(c) The currency benchmark shall only include reserve currencies: Due to the importance of the goals of liquidity and appropriate return, the currency benchmark will be made up of currencies that are recognized around the world as reserve currencies;

(d) The currencies that will be included in the currency benchmark will be those of countries in which there is a range of asset markets, with high liquidity;

(e) In order to achieve a return that covers, in the long term, the financing cost of holding the reserves, in choosing the currency benchmark composition the Committee will take into account the volatility of the reserves' long-term return in shekel terms.

The composition of the currency benchmark shall be examined by the Monetary Committee based on the recommendation of the Markets Department, in accordance with changes in global markets, at the end of each year or if there are material changes in said circumstances.

4. The risk profile

The risk profile determines the maximum level of risk that the Monetary Committee is willing to accept in order to achieve the goals of holding the reserves. In establishing the risk profile, scenario analysis and a range of analytical tools to measure risk, such as VaR, CVaR, and others should be used.

The risk profile will be set so that given the worst 5 percent of outcomes, the average loss will not be greater than 900 basis points over a 1-year horizon (see 3. above). This risk level was set with the goal of limiting risk in the short term and increasing the probability of complying with the target of covering the financing cost in the long term.

The risk level will be set at least once a year by the Monetary Committee in accordance with background conditions.

5. The rules for managing the financial risks of the reserves

The rules for managing the financial risks to which the reserves are exposed, and their asset allocation, which will be set in terms of the currency benchmark, are to be determined in accordance with the goals of the investment policy of the reserves (Section 1 above) and subject to the risk profile set by the Monetary Committee (Section 4). The asset allocation of the foreign exchange reserves in terms of the currency benchmark will be approved at least once a year by the Monetary Committee.

a) The types of assets approved for use in managing the reserves are:

1. Bonds (including bonds with fixed interest, with variable interest, and CPI-indexed bonds)
2. Mortgage-backed securities (MBS) and asset-backed securities (ABS), a maximum of 6 percent of total reserves
3. Tradable Certificates of Deposit (CDs)
4. Fixed term deposits
5. Commercial Paper (CP) issued by governments or with the full and direct guarantee of governments, or by a PSE (Public Sector Entity) or by multinational institutions
6. Equities, a maximum of 27 percent of total reserves
7. Derivatives whose underlying asset is permitted for investment. It should be clarified that the constraints in the guidelines regarding any permitted investment apply as well to investment in derivatives on the same asset as noted in this section.
8. Cash.

b) Management against a benchmark

Control over the financial risk of the reserves is anchored in their management against a system of benchmarks. The rules for managing the financial risks of the reserves generate the currency allocation of the benchmarks, the features of their price risk (such as duration) in each currency, and the asset types included in it. The investment returns of the portfolio managers are measured against these benchmarks.

c) Currency risk:

The currency exposure of the reserves is set by:

1) The composition of the currency benchmark (Section 3 above).
2) Strategic currency exposures relative to the composition of the currency benchmark: The extent of the strategic currency exposures is limited to 10 percent of total reserves. The composition and amounts of the exposures will be set by the Monetary Committee.
3) Short and medium term currency exposures relative to the composition of the currency benchmark: Their amount is limited to 2 percent of the total reserves. The composition and amounts of the exposures will be set by the Markets Department.

d) Market risk:

In order to limit the market risk to which the foreign exchange reserves are exposed the Monetary Committee set:

1. The risk profile of the foreign exchange reserves in accordance with Section 4.

2. Total combined investment in equities (Section 6.a.5) and in corporate bonds (Section 4.e.5) shall not exceed 35 percent of the total reserves.

3. A share of at least 45 percent of the total reserves is to be invested in cash, government bonds, or in deposits at central banks.

e) Credit risk:

In order to limit the credit risk inherent in day-to-day management of the reserves portfolio, the Monetary Committee set the following rules:

1. Investment in the currency, or denominated in the currency, of countries[18] is permitted in countries whose generic credit rating[19] category is at least BBB. Investment in currencies, or denominated in currencies, of countries whose generic credit rating category is BBB is limited to 1 percent of the total reserves and requires the specific authorization of the Monetary Committee.
2. Investment is permitted in bonds and commercial paper (CP) issued by governments, or with full and direct government guarantees, if their generic credit rating category is at least BBB. Investment in the BBB generic rating category is limited to 1 percent of total reserves, and requires the specific authorization of the Monetary Committee.
3. Investment in bonds and commercial paper (CP) of public sector entities (PSE) is limited to a maximum of 15 percent of total reserves, and only in bonds or CP whose generic credit rating category is at least A.
4. Investment in corporate bonds is limited to 15 percent of total reserves. Investment in corporate bonds for which their credit rating is below BBB- is permitted only up to a share of 5 percent of the total reserves.
5. Investment in bonds and CP of multinational financial institutions and deposits with them is limited to 15 percent of the reserves.
6. The total exposure of the reserves to the banking system and brokers should not exceed 10 percent of total reserves
7. Activity is permitted with banks and brokers whose generic credit rating category is at least BBB. Activity with banks and brokers whose generic credit rating category is BBB is limited to DVP[20] (delivery versus payment) alone.
8. If a bank or a broker does not have a credit rating, DVP activity is permitted with them only upon receipt of a full and direct guarantee letter from its parent company and if its generic credit rating category is at least BBB.

f) *Liquidity risk:*

In order to provide an immediate response to the financial problems that arise during emergencies, an appropriate portion of the reserves should be invested in assets that can be

[18] Country—in this document, foreign countries.

[19] Credit rating: The credit rating of at least one of the international credit rating agencies—IBCA International Rating Agency, Moody's Investor Services, or Standard & Poor's Corporation, or another rating company based on the Bank of Israel internal rating—in accordance with the approval of the Monetary Committee.

[20] DVP activity is when the payment and the asset are transferred between the sides at the same time and thus the credit risk in such activity is essentially zero.

liquidated in large amounts at short notice and without negatively impacting their realization value.

1. The assets in which the reserves are invested are classified into 3 levels of liquidity:
    a. Highly liquid assets that can be realized within a month without negatively impacting their realization value.
    b. Assets that can be realized within three months without negatively impacting their realization value.
    c. Low-liquidity assets that can be realized in a period exceeding three months without negatively impacting their realization value.

2. The Monetary Committee is to set a minimum level of investment for highly liquid assets, and set a maximum level for low-liquidity assets. Classification of assets into the various liquidity levels can change due to changes in market conditions.

g) Active management and compliance rules:
The reserves portfolio is actively managed according to the investment policy and within the framework of limited and well defined degrees of freedom, that are to be set by the Monetary Committee.

6. The nonfinancial risks inherent in managing the reserves

In determining the investment policy for the reserves, the exposure of the Bank and of the portfolio to the various nonfinancial risks inherent in investing the reserves—reputation risk, legal risk, political risk, operational risk, and so forth—should be taken into account as well.

7. Measuring returns and reporting them

The reserves are managed with transparency. The Markets Department shall report periodically to the Monetary Committee (see 2 above) on the amount of the reserves and changes in them, the currency benchmark composition, changes in currency exposures, the asset allocation, portfolio duration, country exposure, credit risk, liquidity risk, and the return on the portfolio and its various components in terms of the currency benchmark and in shekel terms. The report should include an analysis of the current developments in the financial markets and their effect on the management of the reserves.

8. Handling passive breaches

The Monetary Committee will set the rules for handling passive breaches from the investment policy guidelines.

Appendix 3: Glossary

	Term	Explanation
1	Active management	An investment management style in which the portfolio manager tries to achieve a return greater than that of a benchmark or market index by deciding to buy or sell securities or by various investment strategies. In this report, the term describes the contributions of decisions to invest in additional assets and countries that are not included in the basic benchmark.
2	Basic benchmark (currency-benchmark composition benchmark)	Represents an asset composition that is low-risk and investable, which meets the reserves' investment policy objective of managing them with a high degree of liquidity. Its currency composition is identical to the currency-benchmark composition. It includes short-term government bonds in the currency-benchmark currencies.
3	Basis point	0.01 percent; one ten-thousandth, or one hundredth of a percentage point.
4	Benchmark portfolio	A hypothetical investable portfolio constructed according to agreed-upon rules, which is used as a yardstick for evaluating the performance of an investment portfolio manager and as an anchor for the portfolio risk management.
5	CVaRp (Conditional Value at Risk)	The risk index that is used to quantify the level of risk, in terms of the expected loss on the investment portfolio in a specific time and given a certain probability (p). In the guidelines, the Monetary Committee set the maximum level of risk for the reserves, so that given the worst 5 percent of possible outcomes, the average loss—the $CVaR_{5\%}$—would not be greater than 900 basis points over a one-year horizon.
6	Contribution of active management (excess return)	The difference between the return on the reserves portfolio and the return on the basic benchmark, which measures the decisions to invest in additional assets and countries that are not included in the basic benchmark. Also termed "excess return".
7	Credit rating	The rating represents a rating agency's assessment of the ability and readiness of the issuer (corporation or government) to meet its required payments fully and on time. The rating represents the relative probability of the issuer to reach default relative to other rated issuers. The major international rating agencies are Fitch, Moody's Investor Services, and Standard and Poor's Corporation.
8	Credit risk	The exposure to the possibility of loss due to failure of timely payment on debt, whether of an issuer, a financial institution or a country, or as a result of changes in the market's evaluation of the probability of such an event.
9	Currency benchmark	A currency basket used for measuring the returns on the foreign exchange reserves. See Chapter B, Section 3 above.
10	Currency risk	The exposure to the possibility of a loss as a result of a change in exchange rates.

11	Foreign exchange reserves	Financial assets that are issued by foreign entities and which are denominated in a foreign currency (including gold). They are exclusively owned and managed by a central bank and are available to it for carrying out its statutory functions without delay.
12	High yield	A credit rating below BBB- or Baa3.
13	Information Ratio	The Information Ratio measures the active management of the portfolio manager relative to the risk taken, and indicates the degree of consistency in the manager's ability to generate excess returns on additional risk. It is calculated as the ratio of the contribution of active management to its standard deviation.
14	Interest rate risk	The exposure to the possibility of a loss as a result of an increase in yields to maturity.
15	Investment grade rating	A credit rating in the range of AAA to BBB- (at Fitch and Standard and Poor's) or between Aaa and Baa3 (Moody's).
16	Investment policy guidelines	The investment policy guidelines include details on the assets, risk profile, and quantitative and qualitative limitations on the types of assets permitted for investment. It should be emphasized that the limitations on the various asset types are not a recommendation for the actual share of investment in those asset types.
17	Liquidity risk	The exposure to a potential loss resulting from the compulsory liquidation of assets in a short period of time and at a larger volume than what the market is able to handle without a negative impact on the market price and/or the buy/sell spread.
18	Market risk	The exposure to a potential loss resulting from changes in asset prices. The market risk of bonds combines the interest rate risk and credit risk, if there is any.
19	Monetary Committee	The Monetary Committee was established in accordance with the Bank of Israel Law, 5770-2010. The Committee consists of six members—three from the Bank and three representatives from among the public. The Governor of the Bank of Israel serves as chairperson of the Committee. The Monetary Committee sets the policy for achieving the Bank's objectives, including monetary policy, and decides on the activities that the Bank must take to achieve them. The Committee is charged with outlining the guidelines for the reserves' investment policy, in consultation with the Minister of Finance, and with monitoring the implementation of such policy. The Committee also approves and updates the division of authorities with regard to the reserves' investment policy, between it and the Markets Department.
20	Modified duration	The sensitivity of a small change in the value of a debt instrument, expressed as a percentage of its original value, to the change in the yield to maturity (with the opposite sign) of the instrument. Measured in units of time.
21	Portfolio duration	The average duration of a portfolio of fixed income instruments (where the duration of each asset is weighted according to its proportion of the portfolio); a widely accepted measure used to estimate the portfolio's interest rate risk.
22	Revaluation	The change in reserves in one currency terms attributed to realized profits from interest and capital gains income, and to the change in value from asset price differentials and from exchange rate differentials vis-à-vis this currency of the currencies in which the reserves are invested. In this report, the currency is dollar.

23	Risk assets	Assets featuring higher risk than government bonds. In this report, the term refers to equities and corporate bonds.
24	Risk-free portfolio	A portfolio in which the investor is not subject to gains or losses.
25	Risk premium	The excess return of a risk asset over the risk-free interest rate.
26	Spread asset	An asset with a yield to maturity that is greater than that of a government bond with a similar term to maturity, due to differences in exposure to credit risk, liquidity risk, operational factors, etc. The yield spread of this asset is measured as the difference between its yield to maturity and that of a government bond with a similar term to maturity. Spread assets include also government bonds denominated in a currency which is not the local currency of the country of issuance.
27	Standard deviation	A statistical measure used to quantify the dispersion of a distribution around its expected value. Often used as a measure to quantify the exposure to uncertainty. See also volatility.
28	Volatility	The standard deviation (see definition in this glossary) of the distribution of holding rates of return of a financial asset, such as a security or portfolio, over a defined time (a day, a week, etc.).
29	Yield curve	A line that plots the yields to maturity of bonds with similar characteristics (such as the bonds of a particular country in local currency) but different maturities.
30	Yield spread	The difference between yields to maturity of two debt instruments.
31	Yield to maturity	The holding rate of return, in annual terms, which would be obtained from holding a debt instrument until its final redemption, if it was possible to invest all of its cash flows at the same rate of return until that date. Synonymous term: internal rate of return.