Chapter 2

Developments in Israel's Foreign Currency Markets in 2004

During 2004, the NIS (New Israeli Sheqel) was stable against the currency basket, depreciating by a modest 0.8 percent. This was the result of moderate appreciation against the US dollar, 1.6 percent, coupled with depreciation of 6.2 percent against the euro. The NIS also depreciated in real terms against the currency basket due to a smaller rise in the consumer price index in Israel than in that of its main trading partners.

During the first five months of the year the NIS depreciated against the dollar, reaching NIS 4.634 in mid-May against the background of portfolio adjustments by Israeli investors out of NIS and into foreign currency during January and February followed by net sales of NIS against foreign currency by foreign financial institutions during March, April and early May.

From May until the end of the year, the NIS strengthened against the dollar primarily due to the weakening trend of the US dollar on world markets. The NIS closed the year at 4.308 against the dollar. Other factors which supported the NIS against the dollar during the year include the perceived improvement in the geopolitical environment and relative calm in the security situation, an increase in foreign investment in Israel, rising global capital markets, the positive domestic economic environment which was supported by continued global growth, the improvement in fiscal discipline, a current account surplus and the decline in global credit risk premiums.

An international comparison shows that the NIS appreciated against the dollar noticeably less than did other currencies, of both advanced and emerging economies. Possible reasons for this include the low level of domestic interest rates and resultant narrow interest rate differential against the dollar, as well as the low volatility of the NIS/dollar exchange rate.

Trading in the NIS market was characterized by stability in 2004 both in comparison to previous years and in comparison with that of other emerging market currencies. This was reflected by a stable NIS/dollar exchange rate, a decline in the volatility of the exchange rate to 4.3 percent from 7.5

percent in 2003, a narrow NIS/dollar trading range, and a reduction in the interbank bid-offer spread to 0.45 agorot from 0.6 agorot in 2003.

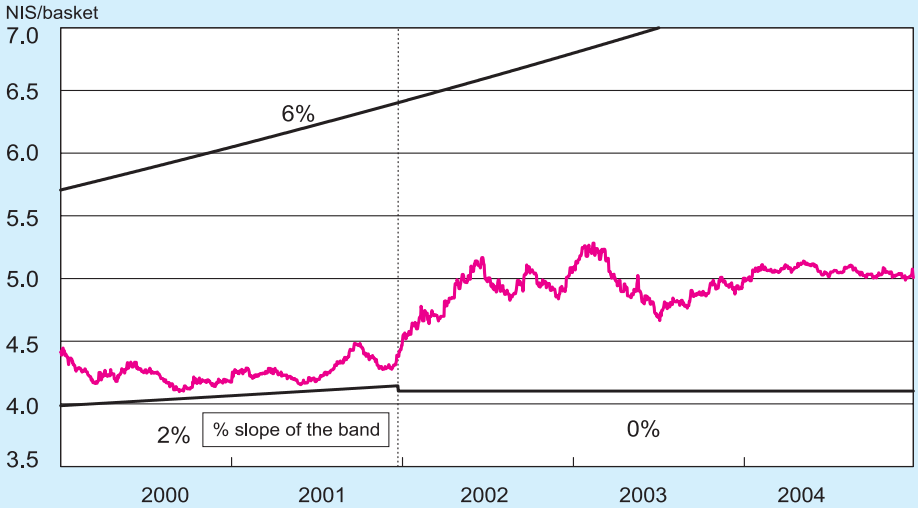
The average daily turnover of foreign exchange in the NIS market totaled $1.65 billion in 2004, representing a marginal decline from the $1.68 billion registered in 2003. This was the first year since the establishment of bilateral NIS/dollar trading in which there was no growth in average daily turnover. Spot market turnover declined to an average of $722 million per day in 2004 from $748 million in 2003 and $827 million in 2002. This can be attributed almost entirely to a decline in interbank spot activity.

1. THE NIS EXCHANGE RATE[1]

During 2004 the NIS was stable against the currency basket, depreciating by a modest 0.8 percent. As a result of moderate 1.6 percent appreciation against the US dollar coupled with 6.2 percent depreciation against the euro.

During 2004, the NIS (New Israeli Sheqel) was fairly stable against the currency basket,[2] depreciating by a modest 0.8 percent. This was the result of moderate appreciation against the US dollar—1.6 percent, coupled with depreciation of 6.2 percent against the euro. The NIS also depreciated in real terms against the currency basket due to a smaller rise in the consumer price index in Israel than in that of its main trading partners. The exchange-rate band widened from 54.9 percent at the beginning of the year to 60.2 percent at the end of the year.[3, 4] The slopes of the upper and lower

Figure 2.1
The NIS Exchange Rate against the Currency Basket, and the Exchange-Rate Band, 2000–2004



SOURCE: Bank of Israel.

[1] Exchange rates quoted in this chapter are representative rates (see Appendix 2.1).

[2] See Appendix 2.2.

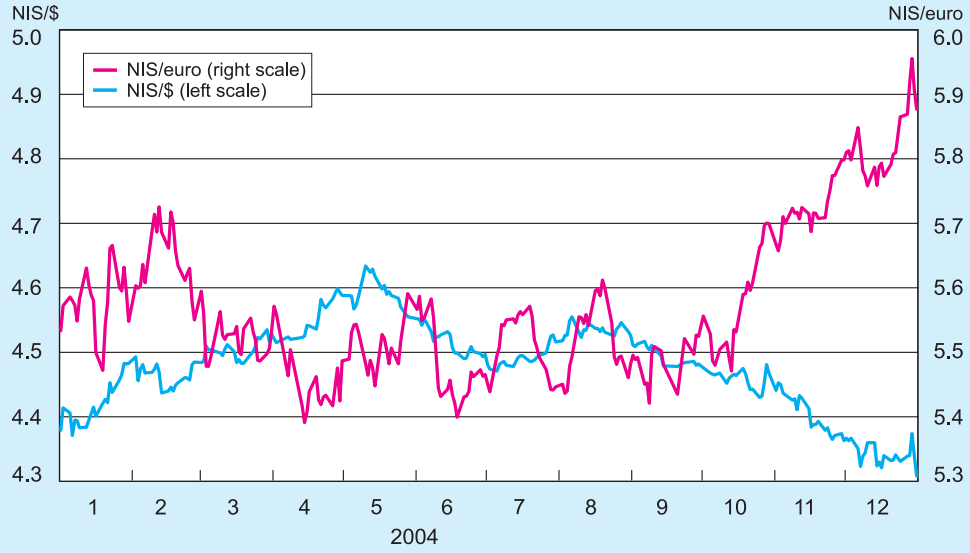
[3] The width of the exchange-rate band and the distance of the exchange rate from the upper and lower limits are calculated in terms of the average of the upper and lower limits of the band (see Appendix 2.3).

[4] The exchange-rate band was abolished on 9 June 2005.

limits of the band remained unchanged at 6 percent and zero respectively, as in 2003. The distance of the NIS from the lower limit of the band was 15.4 percent at the end of 2004, unchanged from the end of 2003 (Figures 2.1 and 2.2).

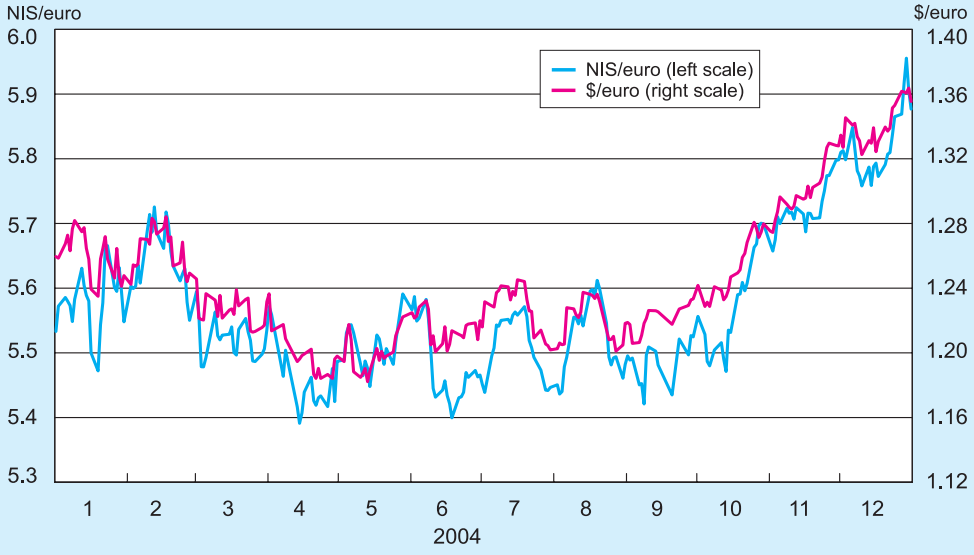
The trend of the NIS against the dollar during 2004 was influenced primarily by the direction of the dollar on the world markets: as the dollar strengthened between

Figure 2.2
The NIS Exchange Rate against the Dollar and the Euro, 2004



SOURCE: Bank of Israel.

Figure 2.3
The NIS/Euro and the $/Euro Exchange Rates, 2004



SOURCE: Bank of Israel.

The trend of the NIS against the dollar during 2004 was influenced primarily by the direction of the dollar on the world markets.

January and mid-May, the NIS weakened; as the dollar weakened, on balance, from mid-May until the end of 2004, the NIS strengthened. Additional factors in both the domestic and international arenas did influence the NIS, but their effects were more moderate and were shorter lived.

Against the euro, the trend of the NIS was similar to the trend of the US dollar against the euro—strengthening until mid-April, range trading from mid-April through August, and then sharply weaker from September through December. The NIS weakened against the euro from 5.5331 at the beginning of the year to 5.8768 at the end (Figure 2.3).

a. The year in review

Until the beginning of May the NIS weakened against the dollar due to the strengthening of the dollar in the international markets and sales of NIS against foreign currency—by residents in January and February, and by foreign financial institutions during March, April and early May.

At the beginning of 2004, there were expectations that during the course of the year the dollar would continue its decline of the previous two years, against the background of the United States' massive twin deficits – the current account deficit and the budget deficit. Between January 2002 and December 2003, the dollar had declined by more than 40 percent against the euro and by about 11 percent on a trade-weighted basis. During the first few months of 2004, however, there was a break in this medium-term trend of a weakening dollar, and the dollar entered a period of cyclical strength. This occurred against the backdrop of growing optimism regarding the US economic recovery and expectations of higher interest rates. Moreover, evidence of strong net portfolio inflows into the United States in late 2003 and early 2004 helped, at least temporarily, to ease market concerns over the financing of the US current account deficit. As a result, the dollar strengthened against all the major currencies until early May, as well as against the NIS.

Israelis sold NIS in response to changes in the tax regulations that lowered the level of taxation on foreign-currency investments to the same level as that levied on NIS investments, and to the contraction of the interest differential between the NIS and the dollar.

Additional factors exerting pressure for a weaker NIS included the sale of NIS against foreign currency by local investors during January and February. This was followed by net sales of NIS in exchange for foreign currency by foreign financial institutions during March, April and early May. The activity of domestic investors in January and February occurred in response to changes in the tax regulations in Israel and in light of the continued narrowing of the interest-rate differential between the NIS and the dollar. The changes in tax regulations lowered the level of taxation on foreign-currency-based investments to the same level as that levied on NIS-based investments, reducing the relative attractiveness of NIS-based investments. It should be noted that these changes took effect only partially in 2004, with more changes scheduled for January 2005. This could renew the domestic trend of selling NIS in exchange for foreign currency, over time.[5] Regarding the interest-rate differential, reductions in the Bank of Israel's policy rate in the early months of 2004 tightened the interest-rate differential between the NIS and the dollar from 3.8 percentage points in

[5] For a further discussion of the potential effects of the changes in the tax regulations see Golan Benita and Haim Levi (2004) "Potential Effect of Elimination of Tax Discrimination between Israeli and Foreign Securities on the Composition of the Public's Portfolio of Assets," *Foreign Currency Issues*, February 2004 (available on the Bank of Israel website: http://www.bankisrael.gov.il).

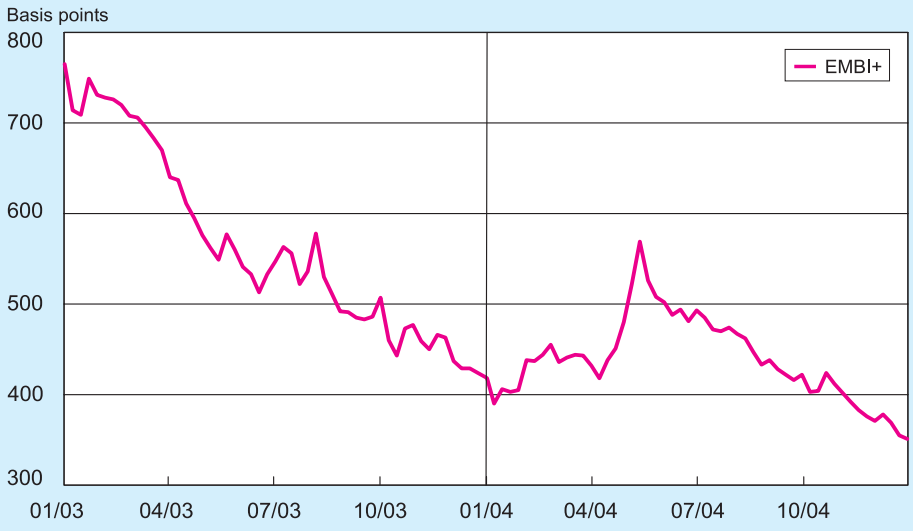
January to 3.1 percentage points in April. Further contraction in this differential was expected later in the year due to hikes in US interest rates.

During March, April and early May foreign financial institutions sold NIS on a net basis. This occurred as part of an international trend of closing carry trades – i.e. selling investments in emerging market (EM) and other high-yielding currencies which had been funded at low-interest- rate currencies. Investors shifted funds into lower-risk government securities whose yields had increased in response to data releases which seemed to point to an earlier-than-expected increase in US policy rates, at a relatively rapid pace. Emerging markets in particular appeared vulnerable to higher US rates due to their need for external funding. In addition, the prospect of higher world oil prices and slower growth in China dampened the economic outlook for some emerging market countries.

During March, April and early May foreign financial institutions sold NIS, as part of an international trend of selling investments in emerging market which had been funded at low interest. This occurred because emerging markets appeared vulnerable to the expected rise in the dollar interest rate.

Investment in EM securities had been very popular in 2003 due to their high yields and in light of the decline in global risk. As a result the yield spread between EM securities and US government bonds, also known as the credit risk premium, contracted from about 765 basis points in January 2003 to 390 basis points in January 2004 (Figure 2.4). The unwinding of carry trades between March and May 2004 caused this spread to widen to about 570 basis points.

Figure 2.4
Spread between Emerging Market Bond Index and US Government Securities, 2003 to 2004

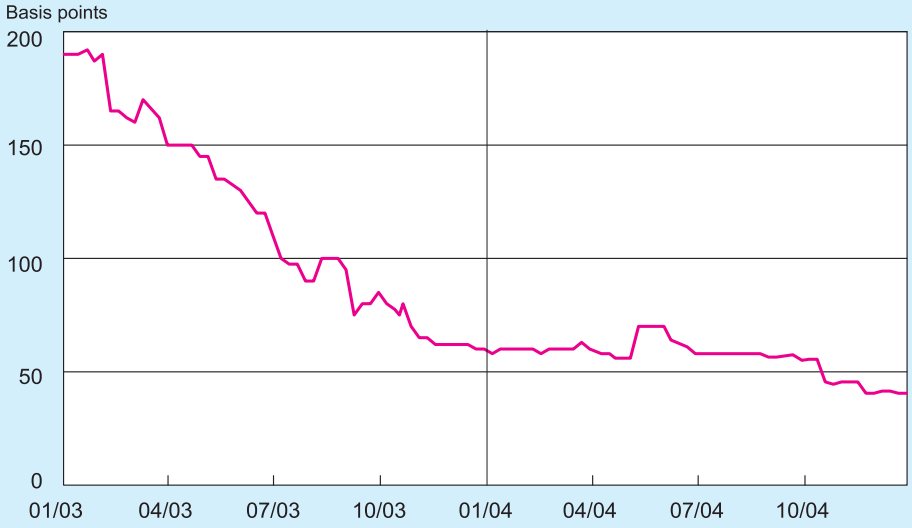


SOURCE: JP Morgan.

Despite the trend for a weaker NIS during the first few months of the year, several factors provided underlying support for the domestic currency. These included (1) confidence in fiscal policy due to the approval of the 2004 budget which included measures to reduce budget deficits, (2) a balanced current account, (3) improvement in the domestic economy and especially the high-tech sector, against the background

Despite the trend for a weaker NIS during the first few months of the year, several factors supported the domestic currency: (1) confidence in the government's fiscal policy, (2) a balanced domestic current account, (3) improvement in the domestic economy (4) inflow of long-term capital, reflecting the global economic recovery, and (5) the reduction of Israel's credit risk premium.

Figure 2.5
Premium on Israel's 5- year Credit Default Swaps, 2003 to 2004



SOURCE: Bank of Israel.

of the global economic recovery, (4) continued inflow of long-term capital as Israeli companies raised funds abroad, reflecting the global economic recovery, and (5) Israel's low credit risk premium, which declined to a very low level in 2004 as did that of other emerging countries (Figure 2.5).[6]

The NIS reached its weakest level of the year at a rate of 4.634 against the dollar on May 10. Against the euro, the strongest level of the NIS was recorded on April 14 at a rate of 5.3911.

Between mid-May and the end of August the dollar traded in a narrow range, with a bias towards weakness. This occurred due to reports, month after month, of further widening in the US current account deficit, data releases reflecting weak economic activity, public statements by Federal Reserve officials suggesting a slower pace of monetary tightening than had been expected, and higher oil prices.

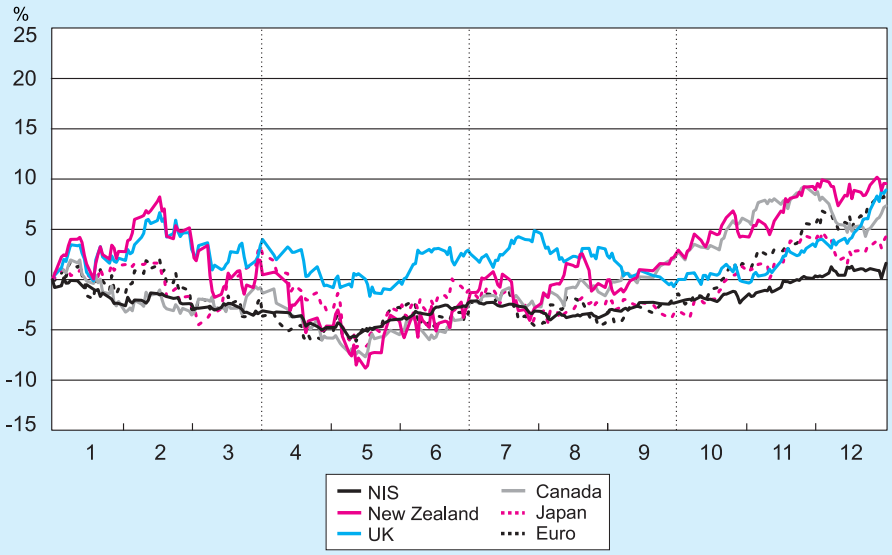
From the middle of May till end-August the NIS strengthened slightly against the dollar, but less than did the currencies of other emerging markets. Apparently foreign financial institutions shunned the NIS due to its low volatility and the low level of interest rates in Israel.

Against this background, international investors went looking for higher yielding investments during June and early July. They renewed carry trades into emerging markets causing spreads to contract and EM currencies to strengthen. That said, the NIS was largely overlooked in this trend. Although the domestic currency did strengthen, its move was significantly more moderate than that of other EM currencies (Figure 2.6b). Apparently foreign financial institutions shunned the NIS due to its low volatility, which offered limited profit potential. The low level of domestic interest rates also dampened foreign interest due to the availability of higher rates in other emerging countries, as well as in some developed economies such as England and Australia (Figure 2.7).

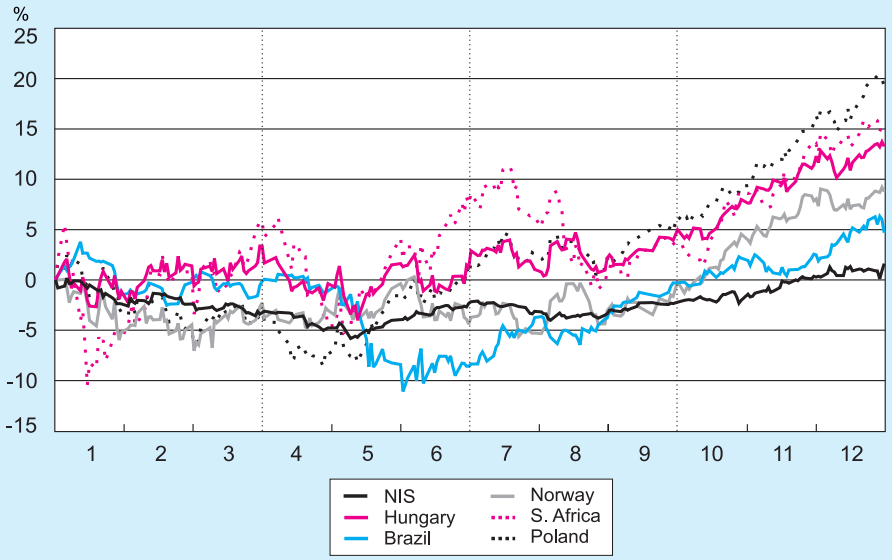
[6] Figure 2.5 shows Israel's credit risk premium as expressed by the premium on Israel's 5-year credit default swaps (CDS). A more detailed description of CDS appears in Chapter 2 of the 2003 Annual Report of the Bank of Israel Foreign Currency Department.

Figure 2.6
Percentage Change of Various Currencies against the Dollar, 2004

a. Advanced Economies and the NIS



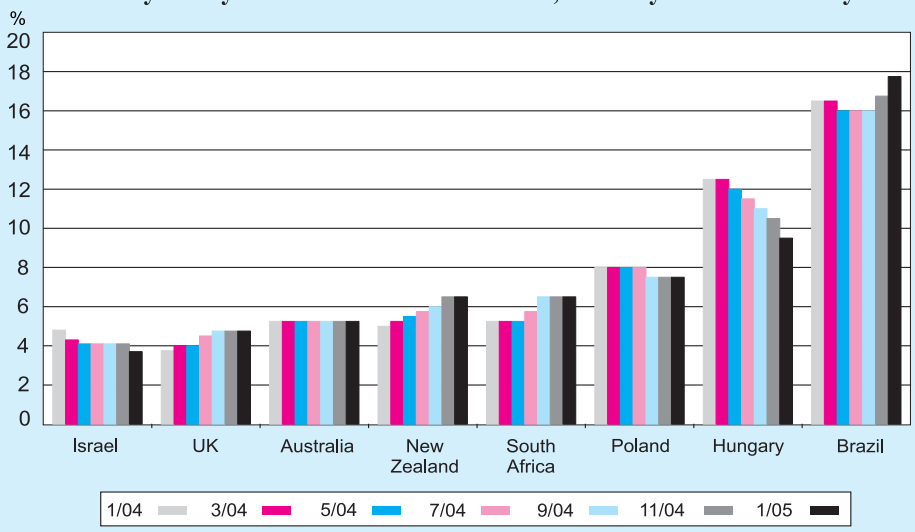
b. Emerging Economies



SOURCE: Bank of Israel and Bloomberg.

From September, the dollar began a weakening trend which was to last until the year-end. Initially, this was due to uncertainty ahead of the upcoming presidential elections (held in early November) and the steep rise in oil prices. In mid-October, data showing the US trade deficit in August to have been the second largest on record together with news that foreign purchases of US securities had slowed unexpectedly in August added further negative sentiment. The slowdown in foreign purchases in

Figure 2.7
Monetary Policy Rates in Various Countries, January 2004 to January 2005



SOURCE: Bank of Israel and Bloomberg.

particular was seen by some market participants as confirmation that Asian central banks and oil exporters were diversifying out of US dollars and into euros. Persistence of such a portfolio shift could undermine the sustainability of the large US current account deficits that have emerged in recent years. Comments toward the year-end by the US Federal Reserve Chairman suggesting that the size of the deficit could lead foreign investors to reduce their holdings of US assets provided further impetus for a weaker dollar. Market participants also concluded that the European Central Bank and the Bank of Japan would not intervene to curb the dollar's slide since they lacked US support.

The NIS strengthened against the dollar between September and the end of December, against the background of the global weakening of the dollar. However, the NIS strengthened more moderately than did the currencies of other countries.

Along with both major and EM currencies, the NIS strengthened against the dollar between September and the end of December, although its trend was more moderate. Foreign financial institutions were particularly active during this period buying NIS and selling dollars. Apparently some of their NIS purchases were invested in the domestic capital markets against the background of rising global capital markets.

Factors supporting the NIS in the last few months of the year included the improvement in the geopolitical situation, the relative calm in the security situation, the increase in nonresident investment in Israel, the boom in the stock market, and the improvement in fiscal policy and in the economic situation.

Other factors supporting the NIS included (1) improvement in the perception of the geopolitical situation due to the government's approval of the Gaza disengagement plan and the new Palestinian leadership, which led to hopes of renewed negotiations in the post-Arafat era, (2) the relative calm in the security situation which was a catalyst for rising tourism during the year, (3) an increase in foreign investment in Israel, especially in start-ups, (4) rising global capital markets, including the domestic stock market which reached historic highs in November and December, (5) the positive domestic economic environment which was supported by expectations of continued global growth in 2005, (6) the 2004 budget deficit which registered 3.9 percent of GDP, just within the target of 4.0 percent, (7) the continued decline in credit risk

premiums to very low levels, (8) the small current account surplus and (9) in the final days of the year, rising expectations for the establishment of a stable, broad-based government coalition.

Three factors exerted pressure for a weaker NIS during the latter months of 2004, but their influence on the NIS/dollar exchange rate is difficult to discern in light of the strong momentum forcing the dollar lower. They were (1) political turmoil, which led to the break-up of the prime minister's coalition during negotiations for the 2005 budget, (2) the possibility, due to payments connected with the Gaza disengagement plan, of the 2005 budget breaching the target of 3 percent of GDP established by the US as a condition for the loan guarantees approved in 2003, and (3) the narrowing interest rate differential with the dollar which reached an historic low of 1.45 percentage points at the end of the year due to repeated US policy-rate rises in the second half of 2004 and the lowering of domestic policy rates in November and December. While the US rate rises were largely anticipated, the domestic rate reduction in November surprised the market. Nevertheless, that move and the subsequent rate reduction in December were deemed by market participants to be the appropriate response to the economic environment prevailing at the time, especially in light of the annual inflation rate which was only 1.2 percent in 2004.

The NIS closed the year at 4.308 against the dollar, an appreciation of 1.6 percent versus its level at the beginning of the year. Against the euro, the NIS weakened to 5.8768 by the end of the year, a depreciation of 6.2 percent versus its level at the beginning of the year.

b. Analysis of the NIS/dollar exchange rate

A comparison of the NIS/dollar exchange rate with the dollar exchange rates of other currencies, of both advanced and emerging economies, raises the question "why was the appreciation of the NIS so modest?" (Figure 2.6a-b). This question is even more poignant in light of the positive domestic and global economic environments, the decline in Israel's risk premium, the apparent improvement in prospects of new peace initiatives, and the long-term depreciation of the NIS in real terms. We offer a number of possibilities which help explain the relative underperformance of the NIS in the short- to medium-term.

The low level of NIS interest and the contraction of the NIS–$ interest-rate differential, the low volatility of the NIS/$ exchange rate, and the tax reform that abolished the tax discrimination between Israeli securities and foreign ones, all these deterred investors from increasing their exposure to the NIS, and helped make the appreciation of the NIS against the dollar such a moderate one.

One possibility is that the low absolute level of NIS interest rates coupled with the narrowing interest-rate differential between the US dollar and the NIS deterred potential investors. As depicted in Figure 2.7, the absolute level of short-term interest rates in several currencies was higher than the NIS interest rate during the year, providing investors with greater carry. Furthermore, in several countries monetary policy was tightened during the year, resulting in even higher carry to short-term investors. In Israel, on the other hand, the monetary policy rate was reduced during the year to an historic low of 3.7 percent and the interest-rate differential against the dollar declined to an historic low of 1.45 percentage points. Another possibility is that the low volatility of the NIS/dollar exchange rate dissuaded market participants

from taking positions in the domestic currency due to the limited potential for turning a profit. A further discussion of the volatility of the NIS/dollar exchange rate is presented in the following section. It is also possible that the precarious security situation continued to dissuade investors from exposure, or perhaps a greater level of exposure, to Israel and the domestic currency. Finally, the tax reform equalizing the tax rate on foreign currency investments with that levied on NIS investments had a weakening effect on the NIS in 2004 as local investors made portfolio adjustments out of NIS and into foreign currency, especially in the initial months of the year. This NIS-weakening effect should be maintained in the long-term as the gradual process of portfolio adjustment continues.

2. NIS MARKET INDICATORS

The average volatility of the NIS/dollar exchange rate was 4.3 percent in 2004, significantly lower than in 2002 and 2003.

The average volatility[7] *of the NIS/dollar exchange rate* was 4.3 percent in 2004, significantly lower than in 2002 and 2003 (Figure 2.8 and Table 2.1) and similar to levels marked in the years 1999 through 2001. During the period between June and October, average volatility was particularly low – 3.3 percent – apparently due to the relatively low level of turnover in the spot market at that time. As turnover increased in the final two months of the year in connection with the weaker dollar and increased foreign interest in the domestic market, volatility increased to levels marked earlier in the year.

Notably, speculators are drawn to volatile markets due to their profit potential, and tend to avoid markets with low volatility. One expression of this phenomenon is that in today's trading arena, many international funds trade in accordance with sophisticated (and usually proprietary) quantitative models. These models, which include data on volatility among other variables, send signals to the fund managers on when to enter and exit various markets. The low volatility of the NIS/dollar exchange rate may result in the NIS receiving few buy or sell signals, which in turn results in relatively lower trade volume and lower volatility. Market participants reported that at various times of the year these "model accounts" were not very active in the NIS market, although they were active in other emerging markets.

Table 2.1
Volatility of the NIS against the Dollar, 1999–2004

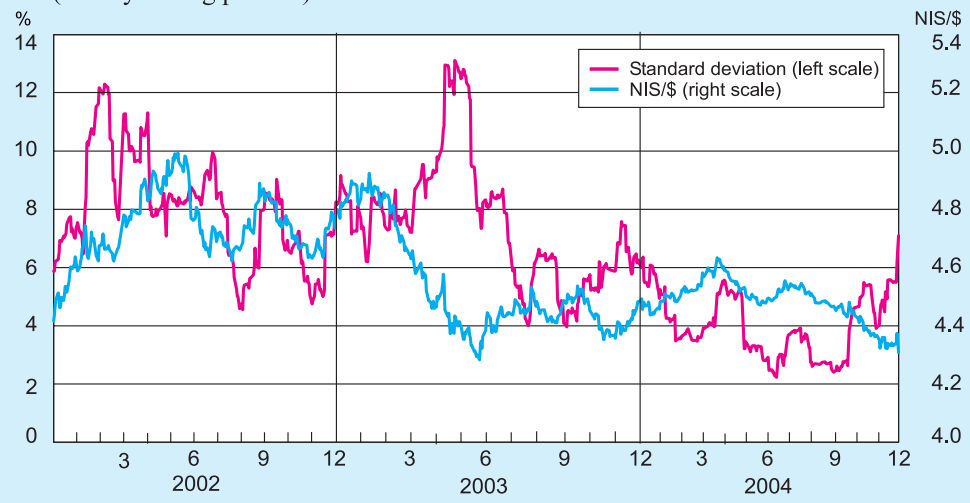
(daily average)

	30-day volatility of NIS/$ (%)	Intraday range of the NIS/$ (in agorot)
1999	4.7	1.0
2000	5.1	1.0
2001	4.0	0.9
2002	8.3	2.1
2003	7.5	1.9
2004	4.3	1.0

SOURCE: Bank of Israel.

[7] The volatility of the exchange rate is defined as the annualized standard deviation of exchange-rate changes during the previous twenty-two business days (approximately thirty calendar days, or one month). The standard deviation is a statistical measure of the distribution of data around its mean, which is often used to measure the risk of financial assets.

Figure 2.8
The NIS/$ Exchange Rate and Standard Deviation, 2002 to 2004
(30-day rolling periods)



SOURCE: Bank of Israel.

The volatility of the NIS against the dollar has been consistently lower than that of other currencies. This may be explained by limited speculative trading in the NIS, together with a high degree of concentration in trade, and the connection between changes in the exchange rate and changes in inflation expectations that are formed by monetary policy.

An international comparison shows that over time, the volatility of the NIS against the dollar has been consistently lower than that of other currencies, of both advanced and emerging economies (Table 2.2a). This low volatility may be explained by several factors, which are probably interrelated. Firstly, the NIS is traded mainly on the domestic market, while the other currencies, including those of other emerging markets, are traded internationally to a greater extent. Secondly, speculative trading, which is estimated by international market makers to comprise at least 50 percent of all foreign-exchange trade, is limited in the NIS market: foreign financial institutions, some of which routinely engage in speculative trading either on their own behalf or on behalf of their clients, accounted for only 18 percent of spot NIS trades in 2004 (see Table 2.3, below). Another possibility is that the Bank of Israel's monetary policy, which is aimed at stabilizing the rate of inflation, has the indirect and unintended effect of stabilizing the NIS/dollar exchange rate as well. This is due to the speedy transmission of changes in the NIS/dollar exchange rate into inflation expectations and eventually into the inflation rate primarily, though not exclusively, through the housing component of the consumer price index. Finally, it could perhaps be argued that the NIS is a dollar-bloc currency. This would result in its volatility against the dollar being naturally low. The Canadian dollar, for example, is considered to be a dollar-bloc currency. With the exception of the last two years, when an increase in the volatility of the Canadian dollar/US dollar exchange rate was marked, the volatility of this exchange rate has been around 5 to 6 percent. Regarding the NIS, the dollar-bloc argument might make sense in light of the proposed connection between monetary policy and the exchange rate as outlined above, in addition to the well-known and disproportionately large influence that the value of the dollar has on the Israeli economy, in excess of its share in international trade, due to its use in the pricing of various services, including

housing. Also note that currencies which are considered euro-bloc currencies exhibit low volatility against the euro (Table 2.2b). The volatility of the Swiss franc/euro exchange rate, for example, is between 3 and 4 percent.

One expression of the stability of the NIS against the dollar in 2004 was the narrow range in which the currency traded, both during the year and intraday.

Trading range. One expression of the stability of the NIS against the dollar in 2004 was the narrow range in which the currency traded. The difference between the lowest NIS/dollar exchange rate (i.e. strong NIS) of 4.308 and the highest exchange rate (i.e. weakest NIS) of 4.634 was 32.6 agorot, or 7.6 percent. This compares with a range of 64.1 agorot (15.0 percent) and 55.7 agorot (12.6 percent) in 2003 and 2002, respectively.

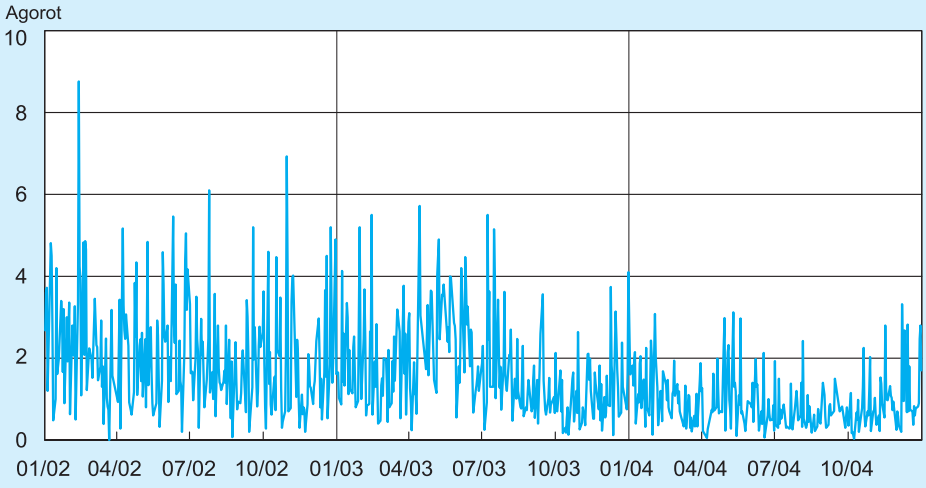
Table 2.2
Volatility of Various Currencies, 1999–2004

(percent)

	1999	2000	2001	2002	2003	2004
a. Against the dollar						
NIS	4.7	5.1	4.0	8.3	7.5	4.3
Euro	9.7	13.8	11.7	9.1	10.2	10.5
Japanese yen	13.7	10.2	10.2	9.9	8.2	9.4
Canadian dollar	6.0	5.4	5.4	6.2	8.7	8.8
Swedish krona	9.4	12.3	12.1	9.7	11.0	11.5
Norwegian krona	9.4	11.0	10.7	9.6	11.5	12.1
New Zealand dollar	10.6	13.3	13.0	10.0	10.3	13.9
Czech koruna	10.0	11.9	11.3	11.3	11.3	12.6
Hungarian forint	8.0	12.8	12.6	10.1	14.2	13.1
Polish zloty	9.9	11.7	10.6	9.6	10.4	11.3
S.African rand	9.3	9.8	13.2	19.1	19.7	20.8
b. Against the euro						
NIS	11.1	15.0	12.4	13.3	13.1	9.2
Swiss franc	2.8	4.2	4.3	3.2	4.0	3.5
Swedish krona	5.3	7.1	7.9	7.1	5.0	3.7
Norwegian krona	4.8	5.4	5.9	5.1	6.9	6.5
Czech koruna	6.3	5.8	5.5	7.4	6.3	5.3
British pound	8.0	10.4	9.0	6.2	7.5	6.6

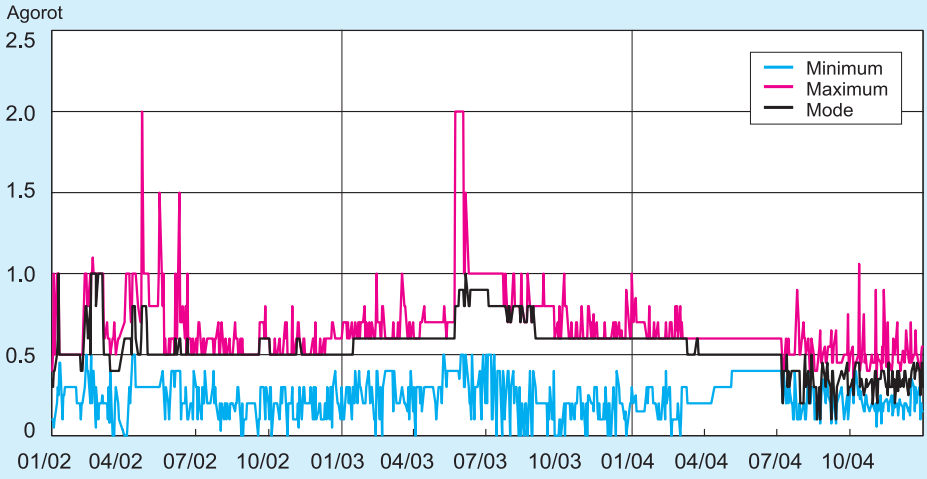
SOURCE: Bank of Israel and Bloomberg.

Figure 2.9
Difference between the Highest and Lowest Intraday NIS/$ Exchange Rates, 2002 to 2004



SOURCE: Bank of Israel.

Figure 2.10
Offer Spreads in the NIS/$ Market, as Quoted by Brokers,[a] 2002 to 2004



[a] Since July 2004 this data has been calculated as the average of hourly observations, rather than one observation per day.

SOURCE: The Broker and Bank of Israel.

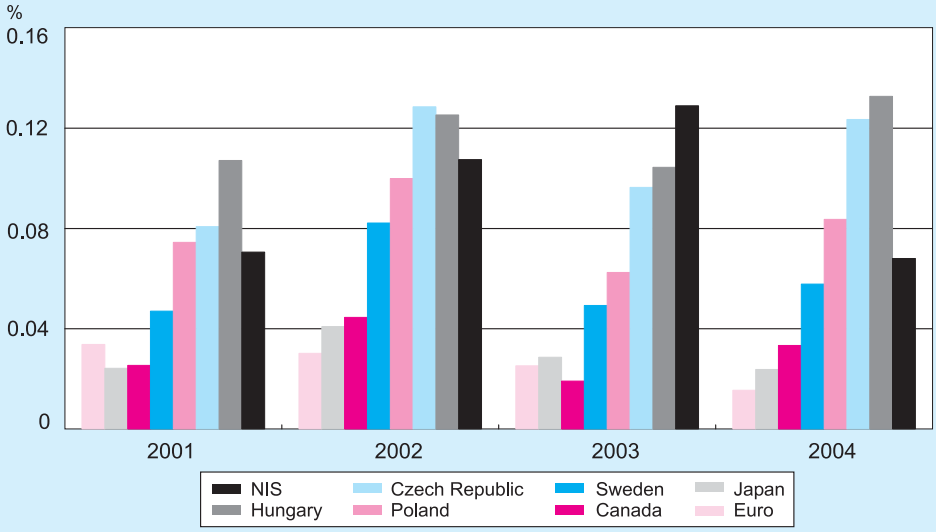
The *intraday range of the exchange rate*, defined as the difference between the lowest and the highest exchange rates recorded in interbank trading on each day, averaged 1.0 agora in 2004, significantly lower than the average of about 2.0 agorot recorded in 2002 and 2003 (Figure 2.9), but similar to the averages of around 1.0 agorot recorded in each of the years between 1999 and 2001 (Table 2.1).

The bid-offer spread of the NIS in 2004 was lower than those in 2003 and 2002, and reflected the stability of the NIS exchange rate this year.

The average *bid-offer spread of the exchange rate*, as quoted by the interbank brokers, was 0.44 of an agora in 2004, lower than the averages of 0.6 and 0.5 of an agora recorded in 2003 and 2002, respectively (Figure 2.10). The narrower spread recorded this year which was marked by an absence of extreme peaks, unlike in previous years, apparently reflects the stability and the low volatility which characterized the NIS market in 2004 and the absence of high-impact events.

A comparison of the bid-offer spreads of various currencies against the dollar (expressed as a percentage of the underlying exchange rate, Figure 2.11), shows that the currencies which are traded most actively on worldwide foreign exchange markets (e.g. euro and yen) generally trade at the narrowest spreads, while those currencies with lower worldwide turnover generally trade at wider spreads (see Box 2.1 for details of global trade turnover as published in the BIS triennial survey of foreign exchange and derivatives market activity, April 2004). During 2002 and 2003, the bid-offer spread of the NIS was in the top of the range whereas during 2001 and 2004 the spread was nearer the middle of the range. This reflects the connection between exchange-rate volatility and the bid-offer spread whereby the bid-offer spreads widens when volatility increases. Apparently, the domestic market makers widen their bid-offer spreads during more volatile periods in order to protect themselves against potential loss.

Figure 2.11
Estimated Interbank Spread of Various Currencies against the Dollar, December 2001–2004



SOURCE: Bank of Israel.

Box 2.1
Results of the BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, April 2004[1]

In April of this year, central banks and monetary authorities in 52 countries, including Israel, participated in the latest triennial survey of turnover in the traditional foreign exchange markets (spot, outright forwards and foreign exchange swaps) and in the markets for over-the-counter (OTC) currency and interest-rate derivatives. The surveys are coordinated on a global basis by the Bank for International Settlements (BIS), with the aim of obtaining comprehensive and internationally consistent information on the size and structure of the corresponding global markets. This was the sixth global survey since April 1989 of foreign exchange market activity and the fourth survey since April 1995 including OTC derivatives market activity.

The 2004 survey shows a large increase in activity in traditional foreign exchange markets as compared to 2001. Average daily turnover, in all

[1] Parts of this article have been reprinted, with permission, from the Bank for International Settlements. See Bank for International Settlements, Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in April 2004, preliminary global results, September 2004 and G. Galati and M. Melvin, *"Why has FX trading surged? Explaining the 2004 triennial survey*," BIS Quarterly Review, December 2004. Both documents are available on the BIS website at www.bis.org.

currencies, rose to $1.9 trillion in April 2004, up by 57 percent at current exchange rates and by 36 percent at constant exchange rates (Table 1).[2] This increase more than reversed the fall in global trading volumes between 1998 and 2001.

Turnover rose across instruments and types of counterparty. Trading between banks and financial customers increased markedly, pushing its share in total turnover up from 28 percent to 33 percent (Table 2). Interbank activity also increased between 2001 and 2004, although its share of total turnover continued to fall, from 59 percent in 2001 to 53 percent in 2004. This is much lower than the 64 percent share of the interbank market in the mid-1990s. For its part, the share of trading between banks and non-financial customers edged up slightly to 14 percent.

Some of the forces that were important in understanding changes in turnover in the past continue to have an impact today, although new factors have emerged as more important in explaining the recent increase in turnover. Between 1998 and 2001, foreign exchange activity declined markedly, because of the advent of the euro, the consolidation in the banking industry, the growth of electronic broking, mergers in the corporate sector, and the events of 1998 (e.g. the Russian default and the collapse of LTCM) which led to a higher degree of risk aversion and a global withdrawal of liquidity. Trends that continue today include consolidation in the banking sector and the growth of electronic broking. Yet these factors are viewed as being relatively less important in 2004 than in 2001.

The surge in market activity between 2001 and 2004 was probably due to several interrelated factors which included, among others, investors' global search for yield which led to investment strategies based on interest-rate differentials, on extended trends in exchange rates, and on investment in foreign exchange as an asset class, as well as an increase in hedging activity. First, the low-interest-rate environment in the US and western Europe coupled with the presence of clear trends in the foreign exchange markets led to a marked increase in investments in high-interest-rate currencies financed by short positions in low-interest-rate currencies. Under such a strategy, known as a "carry trade," the investor bets that the exchange rate will not change so as to offset the "positive carry" accruing from the interest-rate differential. The three main funding currencies for such investments were reportedly the US dollar, the yen and the Swiss franc. The main investment currencies included sterling, and the Australian and New Zealand dollars, as well as a number of emerging market currencies. The long-term depreciation of the dollar coupled with the persistence

[2] The substantial depreciation of the dollar between 2001 and early 2004 explains the large gap between turnover at current and constant exchange rates.

of positive interest-rate differentials rendered this investment strategy profitable and as such a likely factor contributing to turnover growth. In addition, this investment strategy fed back into prices and supported the persistence of long swings or "runs" in exchange rates. As a result, in the context of their global search for yield, so-called "real money managers"[3] and leveraged investors turned to foreign exchange as an asset-class alternative to equity and fixed income. Finally, in the face of long swings in currencies, multinational firms faced greater incentives to hedge in order to minimize losses associated with currency positions.

Regarding the currency composition of turnover, there were no substantial changes between 2001 and 2004. The dollar was on one side of 89 percent of all transactions, followed by the euro (37 percent), the yen (20 percent) and the pound sterling (17 percent). Dollar/euro continued to be by far the most traded currency pair in April 2004, with 28 percent of global turnover, slightly less than in 2001, followed by dollar/yen with 17 percent and dollar/sterling with 14 percent.

The geographical distribution of foreign exchange trading did not change noticeably, as turnover rose fairly evenly in most countries. The UK continued to be the most active trading center, capturing 31 percent of total turnover, followed by the US (19 percent), Japan (8 percent), Singapore and Germany (5 percent each).

With regard to Israel, the main findings of the domestic survey are that (1) average daily turnover in the NIS/foreign currency market increased

Table 1
Global Foreign Exchange Market Turnover in April[a]

(daily average, US$ billion)

Instrument	1989	1992	1995	1998	2001	2004
Spot transactions	317	394	494	568	387	621
Outright forwards	27	58	97	128	131	208
Foreign exchange swaps	190	324	546	734	656	944
Estimated gaps in reporting	56	44	53	60	26	107
Total "traditional" turnover	**590**	**820**	**1,190**	**1,490**	**1,200**	**1,880**
Memorandum item: *Turnover at April 2004 exchange rates[b]*	650	840	1,120	1,590	1,380	1,880

[a] Adjusted for local and cross-border double-counting.

[b] Non-US dollar legs of foreign currency transactions were converted into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2004 exchange rates.

SOURCE: Bank for International Settlements.

[3] The term "real money managers" refers to those who invest their own money and includes pension funds, insurance companies and corporate treasurers. "Leveraged investors," such as hedge funds, borrow a substantial amount of the money they invest.

Table 2
Reported Foreign Exchange Market Turnover by Counterparty in April[a]

(daily average, US$ billion and percent)

	1995		1998		2001		2004	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Total[b]	1,137	100	1,430	100	1,174	100	1,773	100
With reporting dealers	728	64	908	64	689	59	936	53
With other financial institutions	230	20	279	20	329	28	585	33
With non-financial customers	179	16	242	17	156	19	252	14
Local	526	46	657	46	499	43	674	38
Cross-border	613	54	772	54	674	57	1,099	62

[a] Adjusted for local and cross-border double-counting.
[b] Excludes the estimated gaps in reporting included in Table 1.
SOURCE: Bank for International Settlements.

by 38 percent between April 2001 and April 2004 – from $1.4 billion to $2.0 billion and (2) average daily turnover in the non-NIS foreign currency market, which is comprised of all transactions that do not include the NIS such as dollar against yen and euro against sterling, increased by 70 percent between April 2001 and April 2004 – from $1.65 billion to $2.8 billion. A comparison of the growth in the domestic market with that of other countries, which includes transactions in all currencies, is presented in Table 3.

Table 3
Reported Foreign Exchange Market Turnover in Various Countries in April[a]

(daily average, US$ billion)

	2001	2004
Total turnover world wide	1619	2406
United Kingdom	504	753
United States	254	461
Japan	147	199
Germany	88	118
Canada	42	54
Sweden	24	31
Norway	13	14
South Africa	10	10
Poland	8	6
Greece	5	4
New Zealand	4	7
Israel	3	5
Czech Republic	2	2
Hungary	1	3
Turkey	1	3

[a] Includes turnover in all currencies. Adjusted for local double-counting ("net-gross").
SOURCE: BIS, September 2004, and Bank of Israel.

3. TURNOVER IN THE NIS/FOREIGN CURRENCY MARKET[8]

The average daily turnover in the NIS/FX market totaled $1.65 billion in 2004, slightly lower than that in 2003. Turnover in spot transactions declined by 3 percent, while swap activity remained stable.

The average daily turnover in the NIS/FX market totaled $1.65 billion in 2004 versus $1.68 billion in 2003, marking the first year in which turnover contracted (albeit marginally) versus the previous year. The turnover in spot transactions declined by 3 percent in 2004 to $722 million, from $748 million in 2003. Swap activity totaled $932 million in 2004, similar to the $931 million recorded in 2003 (Figure 2.12 and Tables 2.3). NIS trade against the dollar has accounted for between and 87 percent and 90 percent of total turnover over the last 5 years, which is similar to the distribution

Table 2.3
The NIS/Foreign-Currency Market, by Transaction Type and Counterparty, 2000–2004[a]

	Spot Transactions				Swap Transactions[b]				
	Domestic banks and foreign financial institutions	Domestic banks and their customers	Domestic interbank	Total	Domestic banks and foreign financial institutions	Domestic banks and their customers	Domestic interbank	Total	Total Turnover
a. Average daily turnover ($ million)									
2000	79	407	122	608	216	92	20	328	936
2001	116	468	150	734	395	169	60	624	1,358
2002	133	495	198	827	475	160	64	699	1,526
2003	125	479	143	748	588	240	103	931	1,679
2004	131	487	105	722	636	198	98	932	1,654
b. Percentage change in turnover									
2001	46	15	23	21	83	83	202	90	45
2002	15	6	32	13	21	–5	6	12	12
2003	–6	–3	–28	–10	24	50	61	33	10
2004	5	2	–27	–3	8	–18	–5	0	–1
c. Market share (%)									
2000	13.1	66.9	20.0	100	65.9	28.0	6.1	100	
2001	15.8	63.8	20.4	100	63.3	27.1	9.7	100	
2002	16.1	59.9	24.0	100	68.0	22.8	9.2	100	
2003	16.7	64.1	19.2	100	63.1	25.8	11.1	100	
2004	18.1	67.4	14.5	100	68.3	21.2	10.6	100	

[a] Data for 2000 are based on the period June-December, when detailed counterparty data first became available.
[b] Includes one leg of the swap transactions.
SOURCE: Bank of Israel.

[8] The analysis in this section includes only data reported directly to the Foreign Currency Department. Therefore, it includes data on *spot* transactions and *swap* transactions, but does not include data on foreign-currency options, even though an active NIS/dollar options market exists and options positions may be hedged in the spot market. Available data is of market flows, i.e., purchases and sales of foreign currency. No data is available regarding the stock of exposures to foreign-exchange rates. *Spot* transactions include outright forward foreign-exchange trades that settle more than two business days, and even up to a year or more, in the future. A foreign-exchange *swap* is a combination of two transactions – a foreign-exchange trade at the beginning of the swap, i.e., spot, and an outright forward foreign-exchange trade in the opposite direction at the end of the swap. The data here include only one side of the swap transactions, in accordance with the methodology of the Bank for International Settlements (BIS).

of worldwide foreign exchange turnover, according to figures released by the BIS in September 2004.

The stabilization of market turnover in 2004 after a continuous period of growth seems to indicate that the market has matured and has reached equilibrium. However, it is also possible that the slow development of the domestic money and capital markets is hampering further growth in the foreign exchange market. Such progress in the money and capital markets would make all the domestic markets more attractive to foreigners, fostering an increase in their activity. The decline in spot transactions in 2003 and again 2004, which can be attributed almost exclusively to a decline in interbank activity, is also noteworthy.

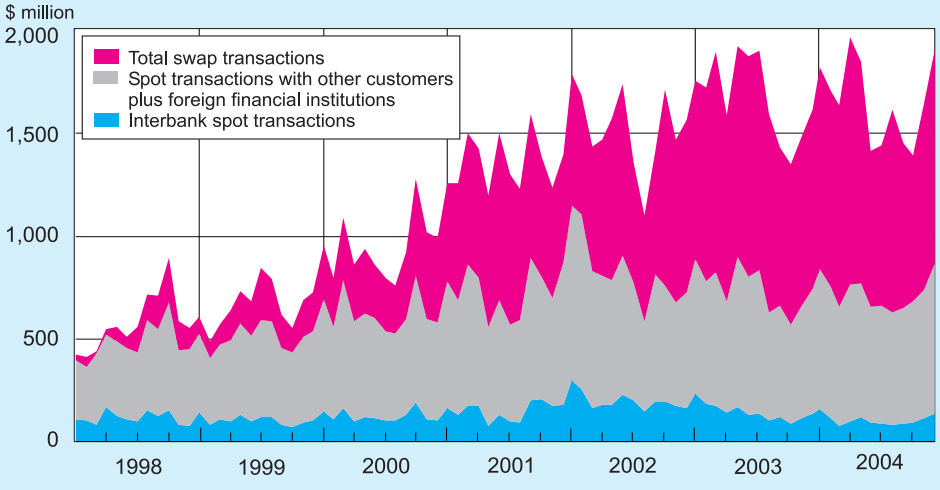
The stabilization of turnover in 2004 may reflect the slow development of the domestic money and capital markets.

Figure 2.12 and Table 2.3 show average daily turnover in the NIS/FX market during 2004 and over the longer term. Transactions between domestic banks and their customers accounted for 41 percent of the market in 2004, versus 43 percent in 2003. Transactions between domestic banks and foreign financial institutions captured 47 percent of the market in 2004, versus 43 percent in 2003.

Foreign financial institutions accounted for 68 percent of swap activity in 2004, as in 2002, and slightly more than the 63 percent recorded in 2003. It should be pointed out, however, that swap transactions are used by foreign financial institutions to finance open NIS positions – both exchange-rate and interest-rate positions. Swaps may be rolled over short term, even daily, which has the effect of inflating total turnover. Supporting this claim, the composition of swaps by term-to-maturity presented in Table 2.4 shows that 93.5 percent of swaps executed by foreign financial institutions were for periods of less than one week. The customers of the domestic banks, in comparison, executed 76.5 percent of their swaps for less than one week and 22 percent

Foreign financial institutions accounted for 68 percent of swap activity in 2004, slightly more than in 2003. Swap transactions are used by foreign financial institutions to finance open NIS positions.

Figure 2.12
Daily Turnover in the NIS/Foreign Currency Market, 1998–2004
(monthly average)



SOURCE: Based on domestic banks' returns.

of their swap activity was for periods of between 1 week and 3 months. This suggests that the banks' customers use swaps for cross-currency liquidity management, among other goals. Swap activity for periods greater than 3 months was negligible for all sectors of the market.

In the spot market, foreign financial institutions increased their market share to 18.1 percent in 2004 from 16.7 percent in 2003.

In the spot market, foreign financial institutions increased their market share to 18.1 percent in 2004 from 16.7 percent in 2003. During the last four months of the year foreign financial institutions were particularly active selling dollars and buying NIS (Figure 2.13) as part of the overall international trend of selling dollars and buying both developed and EM currencies. The active participation of foreign financial institutions in the domestic market in these months contributed to an increase in market turnover and a rise in exchange rate volatility.

Market concentration. The NIS/foreign currency market is characterized by a high degree of market concentration. Although 10 domestic banks are active in the market,

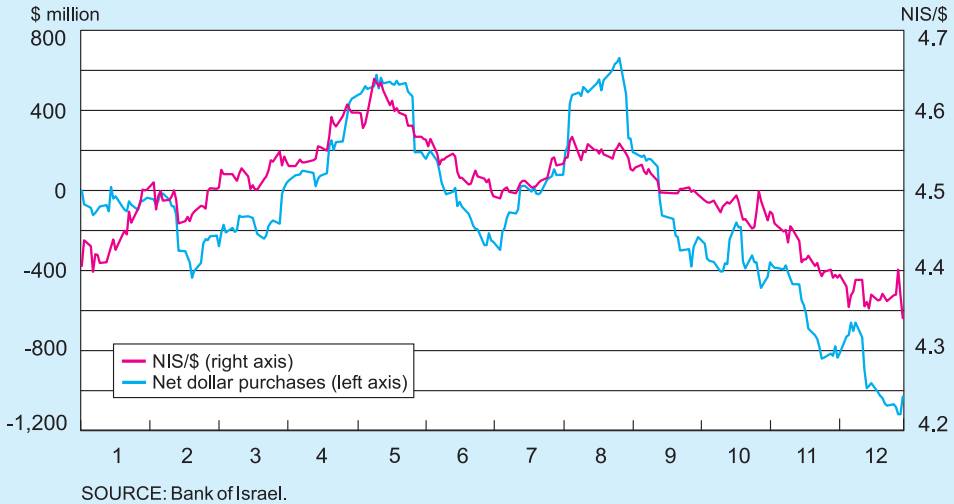
Table 2.4
Distribution of NIS/FX Swap Transactions by Counterparty and Term to Maturity, 2004[a]

(percent)

	less than 1 week	1 week to 1 month	1 to 3 months	3 to 12 months	more than 1 year	Total
Foreign financial institutions	93.5	3.0	2.3	1.1	0.3	100
Customers	76.5	17.3	4.7	1.0	0.3	100
Domestic interbank	85.5	5.9	6.1	1.7	0.8	100

[a] Data are based on the period February-December 2004, when detailed data first became available.
SOURCE: Bank of Israel.

Figure 2.13
Cumulative Net Dollar Purchases by Foreign Financial Institutions and the NIS/$ Exchange Rate, 2004



SOURCE: Bank of Israel.

few actually provide continuous liquidity and the largest banks hold a significant share of the market. The largest three banks, for example, captured 61 percent of spot turnover and the largest five banks captured 82 percent in 2004, versus 57 percent and 83 percent, respectively, in 2003. Regarding total market turnover (spot plus swap transactions), the figures are similar - the largest three banks captured 62 percent of turnover and the largest five captured 82 percent of turnover in 2004.

The NIS/foreign currency market is characterized by a high degree of market concentration, with very few market makers providing liquidity.

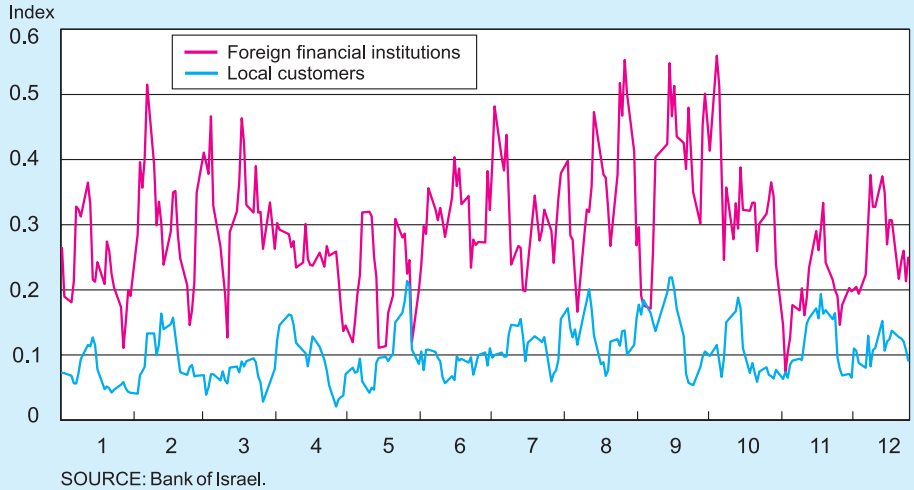
The activity of foreign financial institutions is also highly concentrated. While more than 100 foreign financial institutions executed transactions in the NIS/FX market during 2004, few banks were active on a daily basis. In the spot market, three institutions accounted for 49 percent of turnover and five institutions accounted for 62 percent of turnover. Regarding swap transactions, three institutions accounted for 42 percent of turnover and five institutions accounted for 56 percent. The same three institutions were the dominant players in both spot and swap transactions.

The activity of foreign financial institutions is also highly concentrated.

Homogeneity/heterogeneity of the market. An index of the homogeneity/heterogeneity of the spot market shows that the daily net activity of foreign financial institutions is larger than that of local customers, meaning that they are a more homogeneous group than the local customers. Neither group, however, could be considered very homogeneous. The index, calculated by dividing absolute net foreign-exchange positions by total trade turnover, on a daily basis, reflects complete homogeneity when the index equals 1 and complete heterogeneity when the index equals zero. As in 2003, the index averaged 0.29 for foreign financial institutions during 2004, and 0.10 for local customers (Figure 2.14). These measures make sense intuitively, since domestic customers are a heterogeneous group who trade foreign exchange for a variety of reasons (e.g. imports, exports, fund management, investment, speculation, tourism, etc.).

The activity of foreign financial institutions is more homogeneous than that of banks' local customers. Neither group, however, could be considered very homogeneous.

Figure 2.14
Index of Market Homogeneity/Heterogeneity, 2004
(weekly moving average)



SOURCE: Bank of Israel.

Box 2.2
Changes in the NIS Business Day and the Representative Rate of the NIS

The Bank of Israel is currently in the process of reforming and upgrading the payment system in Israel. This includes the introduction of a Real Time Gross Settlement (RTGS) system, in accordance with international standards. Implementation of this system and its modern technology will enable the lengthening of the business day for NIS transactions to 18.30, from 15.00 at present. In accordance with this change, the Bank of Israel intends to change the time at which the representative rate of the NIS is set.

Currently, the representative NIS exchange rate is published near the end of the NIS business day based on the average rate in NIS of bilateral interbank trading around that time (for further details see Appendix 2.1). This time was chosen due to its convenience to the banking sector and because a reasonable level of liquidity is available in the market, ensuring that the representative rate accurately "represents" the market.

Within the framework of the RTGS system, the end of the NIS business day will be significantly later than the time at which the market is most liquid. When liquidity declines, as it generally does in the late afternoon hours, the exchange rate is subject to sharp movements. As such, a representative rate set at this time may not accurately reflect the level of the market exchange rates traded on any particular day.

For this reason the Bank of Israel will bring forward the time at which the representative rate is published to 12.00. The representative rate will continue to be based on a sampling of interbank trading near the time of the rate setting. Additional reasons for choosing 12.00 include the following: Firstly, this is the time when domestic foreign exchange trading is most liquid. Secondly, foreign exchange markets in Europe and the UK are open and liquid, so the representative rate of the NIS against other currencies, in addition to the US dollar, will reflect the level of international foreign exchange rates. Finally, the timing is consistent with that of other countries in which continuous bilateral foreign exchange trading is the norm, such as the US and England, which publish representative rates near mid-day.

Another discussion concerns the days of the week to be defined as NIS business days, with some consideration that Friday will no longer be a business day. Likely implications of such a change are that the representative NIS exchange rate would no longer be published on Fridays and that Friday would no longer be a value date for banking transactions. Such a change in the business day would not be consistent with international practice and it could inhibit the continued integration of Israel into the global economic arena.

Box 2.3
Cessation of Clearing Services to the Domestic Banks

On the 1 January 2005, the Bank of Israel ceased providing clearing services to the domestic banks for interbank NIS/dollar trades. These services had been available to the domestic banks since 1994, the time of the transition to the continuous bilateral trading system. Initially, these services were offered to the domestic banks in order to reduce the risks associated with clearing foreign currency transactions and to encourage bilateral trade, especially between the larger and smaller domestic banks. The Bank of Israel was able to offer such clearing services to the domestic banks due to the prior existence of foreign currency deposit accounts for the banks at the Bank of Israel. The banks were thus able to use these accounts to transfer foreign currency. With the passage of time and with the development of an active domestic foreign exchange market, it became clear that it was no longer necessary for the Bank of Israel to provide clearing services to the domestic banks.

Due to sanctions enacted at the Bank in connection with labor disputes, the Bank of Israel actually ceased providing these services to the domestic banks in late October, 2004. The Bank reports that the domestic banks swiftly and successfully adapted to the new environment.

4. TURNOVER IN THE NON-NIS FOREIGN CURRENCY MARKET (FX/FX)

The average daily turnover in the FX/FX market reached $2.7 billion in 2004 versus approximately $2.2 billion in 2003 – an increase of only 20 percent. Spot transactions totaled $1.9 billion and swap transactions totaled $798 million in 2004, compared with $1.6 billion and $666 million respectively in 2003.

The average daily turnover in the FX/FX market reached $2.7 billion in 2004, an increase of 20 percent from the level in 2003.

As can be seen from Table 2.5, trade in the FX/FX market differs from that in the NIS/FX market. Firstly, in the spot market foreign financial institutions account for nearly two-thirds of the activity, 60.7 percent, while local customer activity accounts for 38.5 percent of the market. Interbank activity is negligible. This suggests that the domestic Israeli banks offset their customers' FX/FX trades against foreign banks, the natural FX/FX market makers. In addition, it appears that some FX/FX trades are being generated on the back of NIS/FX trades: since the NIS market trades predominantly against the dollar, when a local customer wants to trade NIS against a third currency he may have to execute two transactions—an NIS/dollar trade and a dollar trade against a third currency. As a result, the domestic bank will offset his position with two trades—an NIS/dollar trade with another domestic market maker, and a dollar trade against the third currency with a foreign institution. Finally, it is also possible that the domestic Israeli banks are running positions in foreign currency

In the spot market foreign financial institutions account for nearly 61 percent of FX/FX activity. This activity reflects a balance in banks' activity with their domestic customers, and apparently also the expansion of activity in positions.

with foreign financial institutions as their counterparties. The 28-percent increase in spot turnover with foreign financial institutions this year would seem to suggest an increase in this type of activity in light of, and for reasons similar to, the overall increase in foreign exchange activity as reported by the BIS. The second difference between the NIS/FX and FX/FX market is that swap activity is dominated by trade between domestic banks and foreign financial institutions, 79.8 percent, versus 19.7 percent customer activity. According to market participants, the majority of the FX/FX swap activity is generated by the domestic banks, which use FX/FX swaps to manage their internal, day-to-day cash balances. As mentioned above, renewing swaps on a daily basis has the effect of inflating total turnover. It also seems that when Israeli customers take foreign exchange positions, they do so primarily via spot and outright forward foreign exchange transactions. In order to finance these positions, they borrow foreign currency directly from the domestic banks, eliminating the need for a swap. The domestic banks then cover their open forward positions through swaps against foreign financial institutions.

Table 2.5
The FX/FX Market, by Transaction Type and Counterparty, 2000–2004[a]

	Spot Transactions				Swap Transactions[b]				
	Domestic banks and foreign financial institutions	Domestic banks and their customers	Domestic interbank	Total	Domestic banks and foreign financial institutions	Domestic banks and their customers	Domestic interbank	Total	Total Turnover
a. Average daily turnover ($ million)									
2000	451	392	28	871	272	23	1	296	1,168
2001	655	587	33	1,275	433	25	5	463	1,736
2002	712	562	39	1,313	678	41	3	722	2,033
2003	900	656	12	1,569	554	110	2	666	2,235
2004	1,158	725	15	1,899	630	159	4	793	2,691
b. Percentage change in turnover									
2001	45	50	18	46	59	9	400	56	49
2002	9	-4	18	3	57	64	-40	56	17
2003	26	17	-69	19	-18	168	-33	-8	10
2004	29	11	29	21	14	45	94	19	20
c. Market share (%)									
2000	51.8	45.0	3.2	100	91.9	7.8	0.3	100	
2001	51.4	46.0	2.6	100	93.5	5.4	1.1	100	
2002	54.2	42.8	3.0	100	93.9	5.7	0.4	100	
2003	57.4	41.8	0.8	100	83.2	16.5	0.3	100	
2004	61.0	38.2	0.8	100	79.4	20.1	0.5	100	

[a] Data for 2000 are based on the period October-December, when detailed counterparty data first became available.

[b] Includes one leg of the swap transactions.

SOURCE: Bank of Israel.

APPENDIX 2.1: REPRESENTATIVE RATES[1]

Representative rates give the exchange rates of foreign currencies and the currency basket in terms of NIS. The representative rate of any currency is an indicator of the exchange rate prevailing in the market;[2] it is based on an average of buying and selling prices published by banks, and does not necessarily reflect rates at which transactions were carried out. The rates have no official validity, are not legally binding, and are not published in the Official Gazette. They are used mainly for valuations and in contracts. Parties to a foreign-currency-indexed business transaction may carry out the transaction at any exchange rate agreed between them. The representative rate is binding for such a transaction only if explicitly stipulated in advance by the parties.

Several other Western countries which have bilateral foreign-currency trading systems also publish representative exchange rates. The United States Federal Reserve Bank publishes the mid-rate of interbank trade in New York twice a day. The rate appears on Reuters screen 1FED. The Bank of England publishes a mid-rate, based on its own calculations, daily, at 11:00 a.m., on Reuters screen BOE/SAF.

The Bank of Israel calculates representative exchange rates once a day on foreign-currency business days only, and makes them available to the general public as a purely informational service. There are no representative rates on Saturdays, Sundays, Israeli holidays, Christmas Day, New Year's Day and Easter, when foreign-exchange markets are closed in most countries.[3] There may, of course, be other occasions when representative rates cannot be published due to lack of data or because there has been no trade in foreign currency, or for other reasons.

Information on the new rates of exchange is normally available in the afternoon (see below). The time is not fixed, however, and the rates may be calculated and made available to the public at other times. It is therefore advisable for the parties to a transaction linked to the representative rate to stipulate in advance what the relevant rate is to be: for example, the one published on the date of the transaction, the latest published rate before the date on which transaction is carried out, or the rate published on a certain date before or after the date of the transaction.

Until May 23, 1990 the representative rate of the US dollar on a certain date was calculated as the average of the commercial banks' quoted buying and selling rates (transfers and checks) as reported by the banks to the Bank of Israel. As of May 24, 1990, when multilateral trading in US dollars against NIS between the Bank of Israel

[1] This information is current at the time of publication. It does not replace any law, regulation, or directive. Additional details and explanations may be obtained from the General Information Center, Foreign Currency Department, Bank of Israel, Tel. 02-655-2321.

[2] The representative rate of a foreign currency is not necessarily identical with any of its commercial exchange rates, e.g., rates quoted by commercial banks to their customers, buying and selling rates of banknotes, checks and transfers, and interbank rates.

[3] Until July 31, 1986 no representative rate was published for the currency of a country on its national holidays.

and the authorized dealer banks was introduced, and until multilateral trading was canceled, the representative rate for a given day was the rate at which the daily trading session closed. Multilateral trading between the banks and the Bank of Israel came to an end on April 3, 1995, and all trading has henceforth been on a continuous bilateral basis.[4] The system of determining the representative rate was adjusted at the same time, and the representative rate of the NIS against the US dollar for a specific day is the average rate in NIS of bilateral interbank trading near the end of the business day, the time of which is set by the Supervisor of Banks. As discussed in Box 2.2 in the body of the text, the Bank of Israel intends to change the time at which the representative rate is set to 12.00, as a result of the lengthening of the business day, which should take place in the near future.

The average rate in NIS is calculated on the basis of a sampling of exchange rates published by the banks on the Reuters screens, taken at a random moment, which is currently between 14:15 and 15:15 (or between 11:15 and 12:15 on Fridays and holiday eves). The representative exchange rate is currently published soon after 15.15 (or soon after 12:15 on Fridays and holiday eves). The representative rate is calculated from the average of the banks sampled, and excludes values which deviate from the sample average by more than two standard deviations. In exceptional cases, when the calculated exchange rate does not reflect actual rates prevailing in the market, discretion may be exercised in determining the representative rate.

The representative rates of the NIS against other currencies are based on the representative rate of the US dollar and the exchange rates of the relevant currencies against the US dollar on the international money markets at the moment the representative rate is determined. Consequently, the relationship between the various representative rates reflects the relationship between spot exchange rates abroad at the time they are determined.

On January 4, 1999, with the introduction of the euro in the European Monetary Union (EMU), the Bank of Israel began publishing a representative exchange rate against the euro instead of against the ECU (European Currency Unit). The Bank continued publishing exchange rates against the currencies of the EMU member countries up to and including January 25, 2002.[5] On January 1, 2002 euro-denominated notes and coins were introduced into circulation for use as the single currency of the EMU member countries. The national currencies of these countries were withdrawn from circulation during the first two months of 2002, with the effective dates differing from country to country. Against this background, the Bank has not published representative rates for the currencies of the EMU member countries since January 25, 2002.

[4] For the transition to the continuous bilateral trading system, see the 1994 publication of "Foreign Currency Exchange Rates in Israel," pp.xv-xviii.

[5] Note that there may have been differences between exchange rates calculated (in NIS) for the currencies of the EMU member countries via the euro representative rate, and their representative rates as published by the Bank of Israel. For a detailed explanation of this difference, see the Press Release dated September 15, 1998.

APPENDIX 2.2: THE CURRENCY BASKET

The currency basket was introduced on July 19, 1976. The composition of the basket was based on the shares of five currencies - US dollar, German mark, Pound sterling, French franc, and Dutch guilder - in Israel's goods exports. At that time creeping devaluations of the Israeli pound against the currency basket were carried out. This regime continued until the end of October 1977, when it was changed to a managed float of the exchange rate.

In July 1985, with the start of the economic stabilization program, a regime of a fixed exchange rate against the US dollar was introduced.

A new currency basket was introduced on August 1, 1986. The currencies comprising it and their weights (see Table A2.2.1) reflect their share in Israel's foreign trade of goods and services (imports and exports, excluding diamonds). Since the inception of the basket, the parameters of the exchange-rate regime (today, the exchange-rate band) have been set in terms of the basket rather than in terms of a specific currency.

The number of units of each currency in the basket is determined according to its share in trade during the previous calendar year and to international cross rates at the time the basket's composition is fixed. The number of units of each currency in the basket is constant, but the weight of each currency can change daily according to changes in cross rates. For example, when the US dollar gains strength, its share in the basket rises, and vice versa.

Since the original composition of the basket was determined, the Bank of Israel has periodically checked the composition of trade in the previous calendar year, and compared it to the average composition of the basket in the same period. Until the beginning of 1995 only slight differences between the two were found, so that the composition of the basket was not changed till then, other than the continuous daily changes in weights arising from changes in cross rates. The review carried out in 1995, based on trade figures for 1994, revealed that the weight of the US dollar in the basket was 3.2 percentage points lower than its share in foreign trade. It was therefore decided on June 5, 1995 to increase the US dollar's weight in the basket by a similar amount, with corresponding reductions in the weights of the other currencies in the basket. In discussions between the Ministry of Finance and the Bank of Israel it was decided that each year the final trade figures for the previous year would be reviewed, and if these showed a difference of two percentage points or more between a currency's weight in the basket and its share of trade, the composition of the basket would be amended accordingly.

Following the above decision, on April 30, 1996 the weight of the dollar was increased by 3.3 percentage points, and those of the other currencies reduced accordingly. The review of the trade figures carried out in April 1997, April 1998 and April 1999 (i.e., of trade in 1996, 1997, and 1998) showed no significant differences between the compositions of the basket and of the trade, so that no changes were made to the number of currency units in the basket for these years. In a similar review undertaken in April 2000, the share of the pound sterling in the currency basket was reduced by 2.1 percentage points. The weights of the other currencies were adjusted accordingly. The reviews carried out in April 2001, 2002 and 2003 of the 2000, 2001 and 2002 trade figures, respectively, did not result in a change in the composition of

the basket. The review of the 2003 trade figures conducted in April 2004 led to an increase of 4.37 percentage points in the share of the dollar in the currency basket. The weights of the other currencies were adjusted accordingly.

On January 4, 1999, due to the introduction of the euro in the European Monetary Union, a change was made to the composition of the currency basket. The euro replaced the German mark and the French franc. This change was purely technical and had no effect on the value of the currency basket.

As pointed out earlier, the relative shares of currencies in the basket change on every trading day in accordance with changes in their exchange rates, but the number of units of the currencies composing the basket remain as shown in Table A2.2.2.

Table A2.2.1
Weight of Currencies in the Basket (in percent)

Currency basket	Date	US dollar	German mark	Pound sterling	French franc	Japanese yen	euro
When determining composition							
1986	01.08.86	60	20	10	5	5	
1995	05.06.95	54.8	24.2	8.3	5.6	7.1	
1996	30.04.96	60.3	21	8	5.1	5.6	
2000	02.05.00	64.8		6.8		6.4	22
2004	30.04.04	64.5		5.9		5.6	23.9
At year end							
	31.12.96	60.3	20.7	9	5	5	
	31.12.97	63	18.7	9.1	4.6	4.7	
	31.12.98	62	19.7	8.2	4.8	5.3	
	31.12.99	63.4	–	9	–	6	21.6
	31.12.00	64.9	–	6.5	–	6.1	22.5
	31.12.01	66.2	–	6.5	–	5.5	21.8
	31.12.02	62.9	–	6.9	–	5.7	24.5
	31.12.03	59.1	–	7.2	–	5.9	27.8
	31.12.04	61.8	–	6.2	–	5.8	26.2

Table A2.2.2
Units of Each Currency in Basket

Currency basket	US dollar	German mark	Pound sterling	French franc	Japanese yen	euro
1986	0.6	0.417	0.067	0.339	7.7	
1995	0.673	0.396	0.060	0.322	7.010	
1996	0.674	0.358	0.058	0.293	6.543	
1996 (euro)[a]	0.674	–	0.058	–	6.543	0.228
2000	0.669	–	0.045	–	7.241	0.249
2004	0.718	–	0.037	–	6.921	0.222

[a] Adjustment carried out in 1999 to reflect the introduction of the euro, with no change to the 1996-weights.

APPENDIX 2.3: THE EXCHANGE-RATE BAND[1]

On January 3, 1989 the Bank of Israel, in consultation with the Treasury, changed the policy regarding the determination of the exchange rate against the currency basket.[6] Instead of an exchange rate held constant over a period of time and adjusted from time to time, the rate was allowed to fluctuate within a band with limits 3 percent above and below the midpoint rate. The fluctuation span around the midpoint allowed expression to supply and demand for foreign exchange. Every few months the midpoint was adjusted (i.e. the NIS was devalued). On March 1, 1990 the limits were extended to ±5 percent.

On December 17, 1991 another change was introduced to the regime. Under the new system, there was a gradual, constant, and predetermined adjustment to both the midpoint rate and the band. The midpoint rate rose daily at a fixed pace, so that its cumulative annual rise was constant and known in advance (as were those of the upper and lower limits of the band). The band sloped upwards - hence it was known as the crawling band. With the move to a crawling band, the band's width remained at ±5 percent until May 31, 1995, when it was widened to ±7 percent. On June 18, 1997 the band was widened further, to ±15 percent.

The purpose of the crawling band was to indicate a predetermined path for the development of the exchange rate, and thereby to reduce economic uncertainty. The system was also intended to lower the probability of speculative capital flows, which had occurred in the past whenever there were expectations of a relatively large one-time realignment of the horizontal band. Such adjustments were made from time to time on account of the difference between the rate of inflation in Israel and those of Israel's trading partners. These adjustments were accompanied by severe fluctuations in interest rates.

The slope of the band was originally derived from the difference between Israel's expected inflation for the following year as set by the government, and predicted inflation abroad. When it was first established, the slope was 9 percent. The slope was reduced to 8 percent and then to 6 percent on November 9, 1992 and on July 26, 1993 respectively. In the last few years, the practice has changed such that only the slope of the lower limit of the band has been reduced, whenever possible, according to this principle, while the upper limit has remained unchanged, at a steeper slope than the lower limit. As a result, the band is gradually becoming wider. On June 18, 1997 the slope of the lower limit of the band was reduced to 4 percent, while the slope of the upper limit remained unchanged at 6 percent. On August 7, 1998 the slope of the lower limit was reduced further to 2 percent.

On December 24, 2001 the lower limit of the band was reduced by 1 percent and its slope was reduced to zero at a constant rate of NIS 4.1021 to the currency basket– hence the exchange-rate band can no longer be considered a crawling band. Its width was 60.2 percent at the end of 2004 (based on the average of the two limits).

[4] The exchange-rate band was abolished on 9 June 2005.

The width of the exchange-rate band was 60.2 percent at the end of 2004 (based on the average of the two limits) and it is expected to widen by about 5 percent points per year in the coming years.

Table A2.3.1
Changes in the Exchange-Rate Band of the Currency Basket

Date of change	Change	Currency Basket			US$	
		Mid-point	Representative rate	Change from previous day	Representative rate	Change from previous day
		(NIS)	(NIS)	(percent)	(NIS)	(percent)
03.01.89	**Band introduced**					
03.01.89	Midpoint raised by 13%;[a] limits ±3%	1.948	1.947			
23.06.89	Midpoint raised by 6%	2.064	2.063	4.3	2.017	4.4
01.03.90	Midpoint raised by 6% Band widened to ±5%	2.188	2.094	0.1	1.962	0.2
10.09.90	Midpoint raised by 10%	2.407	2.308	2.4	2.08	2.8
11.03.91	Midpoint raised by 6%	2.552	2.425	5.8	2.192	6.7
17.12.91	**Introduction of crawling band**					
17.12.91	Midpoint raised by 3% Slope of band 9%	2.628	2.564	0.1	2.31	0.1
09.11.92	Midpoint raised by 3% Slope reduced to 8%	2.925	2.870	0.3	2.635	0.6
26.07.93	Midpoint raised by 2% Slope reduced to 6%	3.151	3.070	1.9	2.865	2.1
31.05.95	Midpoint raised by 0.8% Band widened to ±7% No change to slope	3.537	3.52	0.4	3.005	0.3
18.06.97	Gradual widening of the band to reach ±15% by year end	3.7072[c]	3.715	0.2	3.42	0.1
	Slope of lower limit 4%[b]	4.9213[c]				
	Slope of upper limit 6% [b]					
07.08.98	Slope of lower limit 2%	3.8760[c]	3.966	1.7	3.716	1.8
	Slope of upper limit 6%	5.2583[c]				
24.12.01	Lower limit reduced 1%, slope 0% at constant rate of NIS 4.1021/basket	4.1021[c]	4.378	0.2	4.335	0.3
	Slope of upper limit 6%	6.4033[c]				

The width of the exchange-rate band was 60.2 percent at the end of 2004 (based on the average of the two limits) and it is expected to widen by about 5 percent points per year in the coming years.

[a] Including a rise of 5% on 27.12.88.

[b] Without any time limit.

[c] Upper and lower rates of the band. Since 18.06.97, exchange-rate policy relates to the limits of the exchange-rate band, and not to the midpoint rate. The midpoint rate is now used by the Foreign Currency Department for statistical purposes only and does not have any implication for the exchange rate regime.