Chapter 3
Inflation and Monetary Policy

- The consumer price index rose by 3.8 percent in 2008, the second consecutive year when it exceeded the upper limit of the inflation target of 1-3 percent a year.
- Inflation did not follow a uniform path during the year: it was high during the first half of the year, continuing the previous year's trend, due to the large increases in world prices for energy and food and to vibrant local activity. During the second half of the year the inflation environment fell heavily as a result of the sharp drop in energy prices and worldwide commodity prices, the slowdown in local real activity, and the worsening of the global financial crisis from September onwards. In the fourth quarter, inflation expectations for twelve months ahead actually fell to a negative rate. The accelerating housing item prevented a more substantial decline in inflation during the second half.
- Monetary policy during the year was conducted against the background of the global crisis that began in the summer of 2007 and worsened during 2008. Until September inflation was above the upper limit of the targeted level concurrent with expectations of a recession in financial and real activity. This background led to frequent changes in the direction of the interest rate, because of frequent changes in the assessment of the scale and timing of economic risks: the interest rate for January was increased by 0.25 percentage points, to 4.25 percent; in each of the months March and April it was cut by 0.50 percentage points, and starting from June it was increased by four consecutive steps of 0.25 percentage points each, back to a rate of 4.25 percent.
- From September onwards, in view of the worsening of the global crisis and growing signs of a major downturn in real activity, all the considerations employed in interest rate decisions supported sharp reductions in the rate, which was cut to a historically low level: at the end of the year it stood at 2.5 percent. The rate cuts continued at the beginning of 2009 as well, and as the rate approached its zero bound there was a need to employ additional policy tools. Thus, in February 2009 the Bank of Israel announced it would start operating in the secondary market of local government bonds, so as to directly influence long term interest rates.
- After more than a decade without intervention in the foreign-exchange market, in 2008 the Bank of Israel began to purchase foreign currency, intending to increase the country's foreign exchange reserves. The timing of the purchasing program was picked according to the sharp and continuous appreciation of the NIS, which supported the increase in the reserve in a manner consistent with other monetary-policy objectives.
- Credit and liquidity data indicated that certain sectors were beginning to suffer from credit difficulties, as was expected in view of the slowdown in real activity and the increased perception of risk by the financial sector. Since mid-September, activity in the IPO market for nonbanking credit was restrained. However, these developments were not indicative of a liquidity problem that was prevalent in the American and European economies (mainly since September).

1. MAIN DEVELOPMENTS

a. Developments from a multi-year perspective

Inflation in 2008 exceeded the upper limit of the targeted range, and amounted to 3.8 percent. The first half-year was notable for a high inflation environment, while the environment became more moderate in the second half.

Inflation in 2008 exceeded the upper limit of the targeted range, and amounted to 3.8 percent. As apparent from Figure 3.3, the development of inflation was not uniform during the year: The first half was notable for a high inflation environment, continuing the trend that emerged at the end of the previous year, while the environment became more moderate in the second half. This development mainly resulted from the dramatic developments in international markets which encompassed the entire world.

Viewing overall developments during the year, it can be seen from Table 3.1 that inflation in 2008 was the highest since the inflation target was set within the range of 1-3 percent in 2003, and that private analysts' and capital market forecasts regarding inflation in the different terms rose during the year: Private analysts' forecasts rose to an annual average of 2.4 percent, after five years when these forecasts had ranged within the center of the target. Also apparent from the table is the large appreciation of the shekel during the year, despite the low interest rate.

The impact of monetary policy on inflation is largely based on its success in anchoring inflation expectations, since these expectations affect actual inflation via their influence on decisions taken in advance. This is one of the reasons why in recent years central banks have tended to adopt an inflation forecast targeting policy. A policy such as this operates by stabilizing expectations within the targeted range, and requires the central bank to gain the public's confidence. Expectations thereby serve as an indicator of the credibility attributed by the public to the monetary policy. Obviously, in order to stabilize inflation expectations, the central bank has to stabilize actual inflation as far as possible.

Twelve-month inflation expectations very rapidly stabilized within the target range, and stayed within it for most of the time since 2003, when the target was set, even when actual inflation deviated from the target to a considerable extent. In 2008:Q4, however, they declined sharply to below the lower limit.

It is interesting in this respect to examine the development of inflation expectations since the present target was set in 2003.[1] Figure 3.3 shows that expectations for the term of a year very rapidly stabilized within the targeted range, and stayed within it for most of the time, even when actual inflation deviated from the target to a considerable extent.[2] The last quarter of 2008 proved to be an exception: during this quarter inflation expectations declined sharply from the upper limit environment, which it reached for the first time since 2003, to below the lower bound. Figure 3.3 also shows that long-term expectations, for a range of ten years, converged within the targeted range more gradually. This indicates that in the initial years after the stabilization of the target, public confidence that a responsible policy would be maintained was gained only gradually. Once long-term expectations converged within the targeted range however,

[1] See also Box 3 in Inflation Report 21, on the second half of 2007: "Analysis of Expected and Actual Inflation Since 1994."

[2] A discussion concerning stationarity of inflation following a stabilization period, based on a theoretically based model which was estimated on Brazil and Israel, is presented in: A. Barnea and N. Liviatan (2008), "The Chronic Inflation Process: A Model and Evidence from Brazil and Israel," *Journal of Economic Policy Reforms 11, No. 2,* 151-162.

Table 3.1
Main Indicators of Inflation and the Monetary Policy, 2003–08

	2003	2004	2005	2006	2007	2008	2008 I	2008 II	2008 III	2008 IV
A. Inflation[a] (percent)										
1. Inflation target	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3
2. Actual inflation	-1.9	1.2	2.4	-0.1	3.4	3.8	0.1	2.2	2	-0.6
3. One-year inflation expectations derived from the capital market[b]	2.0	1.6	2.0	1.8	1.4	1.9	2.5	2.8	2.6	-0.2
4. Ten-year inflation expectations derived from the capital market[b]	4.6	3.5	2.5	2.5	2.5	3.0	2.8	3.0	3.0	3.3
5. Forecasters' one-year inflation forecasts[b]	2.0	2.1	2.1	1.9	1.9	2.4	2.5	3.0	3.0	1.2
B. Yields (percent)[b]										
1. Bank of Israel key interest rate	7.5	4.2	3.7	5.3	4.0	3.7	4.1	3.3	4.0	3.2
2. Expected real interest rate[c]	5.8	2.7	1.7	3.4	2.7	1.8	1.6	0.6	1.4	3.5
3. Nominal yield to maturity on unindexed government bonds[d]	8.0	6.6	5.5	6.0	5.3	5.8	5.8	5.9	5.9	5.6
4. Real yield to maturity on CPI-indexed government bonds[d]	4.9	4.0	3.3	3.8	3.3	3.4	3.3	3.2	3.3	3.8
C. Depreciation of the NIS (percent)[e]										
1. Against the currency basket	3.5	4.4	0.0	-3.5	-1.4	-8.3	-7.2	-4.6	0.6	2.9
2. Against the dollar	-6.4	-1.2	6.2	-8.9	-7.1	-0.9	-7.6	-5.7	2.1	11.1
3. Against the euro	12.7	8.0	-6.1	1.5	2.4	-8.4	-0.7	-5.9	-5.4	6.0
D. Change in asset prices (percent)[e]										
1. Total (nominal) return on shares	44.4	17.8	35.5	7.9	21.7	-45.7	-15.1	5.2	-15.6	-27.5
2. Apartment prices	-5.2	-1.2	3.8	-3.8	1.7	11.7	2.3	2.0	7.6	-0.5
E. The monetary aggregates (nominal rate of change, percent)[f]										
1. Money supply (M1)	7.7	17.9	23.8	8.3	17.4	17	0.1	4.6	6.6	5.2
2. Total credit (C3)	-3.0	2.7	3.7	2.2	6.1	6.0	-0.5	2.1	2.0	2.4
F. Actual budget deficit (percent of GDP)										
1. Domestic deficit excluding credit granted	6.1	3.2	1.1	0.3	-1.0	1.4				
2. Total deficit excluding credit granted	5.6	3.8	1.9	0.9	0.0	2.1				
G. Other backround data (percent)										
1. Rate of unemployment[b]	10.8	10.3	9.0	8.4	7.3	6.0	6.2	6.0	5.9	6.3
2. Rate of GDP growth[f]	2.3	5.2	5.3	5.2	5.3	4.1	5.1	3.6	1.9	-0.5
3. Share of total government debt in GDP[g]	99.2	97.6	93.5	84.5	78.5	76.3				

[a] Change in CPI during the year.
[b] Annual average.
[c] Nominal rate of interest on Bank of Israel auctions *minus* inflation expectations, annual average.
[d] Gross yield to all Terms.
[e] December average vis-à-vis December average in previous year.
[f] Annual average vis-à-vis that of previous year.
[g] Balance of debt at end of year divided by annual GDP.
SOURCE: Based on Ministry of Finance and Central Bureau, Statistics data.

it can be seen that their volatility was lower than that of expectations for the term of a year and that in contrast to the latter, they were actually located around the upper limits of the target in the last quarter of 2008.

b. Developments in the course of the year

Against the background of the dramatic developments in the global economy, 2008 can be divided into two periods that are separated by the month of September.

The development of inflation and monetary policy was influenced by the dramatic global crisis, which began in summer 2007 and worsened during 2008, principally from September onwards. This crisis does not take the form of yet one more turnaround in the business cycle, and is the worst since the Depression of the 1930s, with which it shares a number of characteristics (while also exhibiting new characteristics).[3]

Against the background of the dramatic developments in the global economy, 2008 can be divided into two periods that are separated by the month of September, during which the American government enabled the Lehman Brothers Investment Bank to collapse. **During the first period** the turnaround in the global business cycle continued. This turnaround began back in 2007, and ended a period of rapid growth from which the Israeli economy had benefited since 2003. The turning point in the global business cycle is usually regarded as the onset of the subprime crisis in the summer of 2007. However, despite the global financial crisis and the downturn that became apparent in global growth, until September 2008 the inflation environment in Israel remained high as the result of two main factors: (1) In spite of the downturn in real activity that became apparent, energy prices continued to rise rapidly and prices of agricultural produce remained high following a continued increase, until the turnaround in mid-year which led to a large drop in prices to the level prevalent at the beginning of the wave of price increases (Figure 3.4); (2) The turnaround in the Israeli economy was gradual, and the rapid growth typical of the rising part of the business cycle was still apparent in the first half of 2008. **During the second period**, which began in September 2008, the global crisis worsened dramatically. Even before then, it was apparent that the extent of the crisis exceeded the parameters of a "natural" turnaround in the business cycle. Following the collapse of Lehman Brothers in the middle of September 2008, its dimensions reached unprecedented proportions which few had been able to envisage in good time. The worsening of the crisis was reflected by the collapse of banking and financial institutions worldwide and by the liquidity and credit crunch in the USA and Europe, which led to a large drop in the prices of real and financial assets throughout the world. Against this background, in September the actual inflation rate rose considerably and inflation expectations for the term of a year fell to negative rates (Figure 3.3). This development in inflation expectations derived from the consolidation of the decline in world prices for energy and agricultural produce, from the downturn in local activity from the third quarter and from the worsening of the global financial crisis, which affected financial developments in Israel as well. As a result of these developments, at the end of September 2008 the monetary policy

[3] See: D. Michael Bordo (2008). "An Historical Perspective on the Crisis of 2007-2008", NBER Working Paper No. 14569.

changed, from a policy of frequent changes in the interest rate trend, due to frequent changes in the assessment of the extent, seriousness and timing of economic risks, to a policy of sharp reduction in the interest rate. Figure 3.2 presents the decline in inflation expectations, as well as the reduction in the monetary interest rate, to the lowest levels ever prevailing in the economy. Figure 3.1 presents the course of the monetary interest rate in the USA and Europe as well, and shows that this pattern of monetary policy was not unique to the Israeli economy.

The crisis, which began as a financial crisis in the USA, spread throughout the world via a number of channels.[4] However, the dominant effects on the Israeli economy were actually exerted via the non-financial channel. The development of the monetary interest rate in Israel and the changes in it during 2008 derived from differences in timing and intensity between the channels via which the global crisis impacted the Israeli economy, and from differences between these effects and the initial assessments of policymakers. The first channel was the direct channel whereby entities that held financial assets such as subprime mortgage-backed securities were hit by the decline in the value of these assets. The impact of the crisis on the Israeli economy via this channel was very limited, because Israeli financial institutions' direct exposure to assets of this type was relatively low. The second channel was a financial effect with non-financial implications: The impact of the crisis on the world's financial systems was reflected by a decrease in the prices of financial assets and by a liquidity and credit crunch. In the Israeli economy these phenomena have been more limited than elsewhere, at least until now, and have been mainly apparent in the equities and fixed-income markets (which suffered serious losses from September) while the inter-bank credit and inter-bank trading markets remained robust and resilient. The decline in corporate bond and share prices led to a decline in the wealth perception and harmed occupational security, thereby resulting in a downturn in private consumption and investment. The third channel is a completely non-financial channel: the drop in demand for exports from Israel because of the contraction in world trade and the appreciation of the shekel. The impact of the crisis via this channel was gradual and occurred later than initially expected.

The turnaround in real economic activity in Israel was more gradual and later than expected.

Although the downturn in share and corporate bond prices began back in the summer of 2007, reflecting the public's expectations even at that time of a decline in activity and profitability, the turnaround in the Israeli economy came at a later stage. The turnaround was more gradual and later than expected also by comparison with the results of the models employed by the Bank of Israel, models that were developed for the purposes of analyzing, assessing and supporting monetary policy. Part of the mechanisms operating in the previously mentioned channels, worldwide interest rate cuts, and the volume and prices of world trade, are analyzed quantitatively in these models. Other mechanisms, such as asset effects, liquidity and credit difficulties, the impact on capital movements, the increased perception of risk, and the herd effect,

[4] An analysis of these channels can be found, inter alia, in: Max Corden (2008), "The World Credit Crisis: Understanding It, and What To Do", Melbo*urne Institute Working Paper No. 25/08.*

are not expressed in the models, and can therefore only be subjected to a judgmental analysis.[5] The parameters included and not included in the models exerted a downward pressure on inflation and the interest rate for most of the year, and especially after September. The turnaround that was expected in the inflation environment and the interest rate on the basis of these factors turned out to be more definite and earlier than actually occurred.

Interest rate decisions up to September were affected by the dilemma resulting from the combination of high actual inflation and expectations of a slowdown that would lead to a decline in inflation. Against this background, the interest rate path changed directions several times up to September.

Interest rate decisions in 2008 were affected by the dilemma resulting from the combination of high actual inflation and expectations of a slowdown that would lead to a decline in inflation. The high actual inflation derived both from supply-side factors and demand-side factors, a continued increase in the prices of imported inputs and a continued upturn in demand for domestic production. Although in both cases a turnaround leading to a large decline in the inflation environment was expected, the actual timing of the turnaround was shrouded in uncertainty. (It actually proved to be gradual and later than initially expected.) During the first three quarters of the year, until the turnaround came, the consumer price index was notable for high inflation. However, the index excluding fuel and food prices rose in line with the inflation target, implying that the increase in the prices of energy imports and food did not spill over to all the items of the index.[6] Since the impact of policy is not immediate but acts with some delay, interest-rate decisions were made on the basis of the expected turnaround and high inflation that was limited to certain items and which did not spill over to all the items of the index. But after several consecutive months of surprises in an upward direction, in the consumer price indices as well as in activity, private analysts' forecasts and capital market expectations began to rise towards the upper limit of the inflation target or even above it. In itself, the rise in expectations threatened to lead to price increases that would be expressed by the spread of high inflation to all items of the index, prompting the Bank of Israel to raise the interest rate. In September, when the turnaround actually came, the extent of the impact of the global crisis, on both prices of imports and demand for domestic production, became clear. As a result, the inflation environment fell heavily and the Bank of Israel cut the interest rate drastically.

The deterioration from September led to a sharp fall in the inflation environment, and the Bank of Israel cut the interest rate drastically.

As is usual and as is necessary with a flexible inflation targeting regime,[7] monetary policy during the year was directed at achieving price stability while also supporting

[5] Credit difficulties can be subjected to a limited analysis only by means of one of the models, which includes a distinction between the central bank's interest rate and the interest rate on overdrafts.

[6] Studies compiled at the Bank of Israel during recent years adopt conflicting positions regarding the appropriate response to the development of a deviation between inflation in the general index and inflation in the index exclusive of certain items. Supporting the forecast targeting of inflation exclusive, if only partially, of the effects of the exchange rate or import prices are: N. Zusman and Y. Lavi (2007), "Philips Curve in Israel," Bank of Israel Survey 80, pp. 105-122; and Z. Eckstein and G. Segal (forthcoming), ""Monetary Policy in Response to Imported Price Shocks: The Israeli Case", Bank of Israel working paper. As opposed to them, supporting the management of a policy that responds to changes in the general index is the working paper "Inflation Targeting Revisited," Bank of Israel 2007.

[7] See the Bank of Israel Annual Report for 2006, Box 3.1, which discusses a flexible inflation targeting regime.

financial and real activity.[8] Accordingly, interest rate decisions during the year were affected not only by the development of inflation, but also by developments in the financial system. As evident from the monetary and credit aggregates, these developments did not reflect a liquidity shortage such as that typical of the financial systems in the USA and Europe. Nevertheless, data on the financial system, mainly after the events of September 2008, reveal the development of credit difficulties in certain sectors of activity, difficulties that are characteristic of an economy moving from growth to a downturn in the business cycle: The activity in the IPO market was restrained, net interest margins in the local currency segment expanded and exacerbated financing difficulties in all the principal industries (see Chapter 4: The Financial System). The increase in margins was reflected by a considerable expansion in the yield spreads between corporate bonds and government bonds, increasing the trend that began with the onset of the subprime crisis in the summer of 2007 (Chapter 4), and by an expansion between the interest rate on overdrafts and the Bank of Israel interest rate (Table 3.2). Table 3.2 shows that since the summer of 2007 these spreads have ranged between 5.6 and 6.2 percentage points, slightly more than the range of 5.1 to 5.6 percentage points within which they varied previously. The development of the spreads as presented in the table, is also indicative of the development of risk assessments among the commercial banks: During the past two years the spread between the interest rate on overdrafts and the Bank of Israel interest rate expanded three times, immediately after the onset of the subprime crisis in summer 2007 (and the Heftziba episode that emerged simultaneously),[9] following the collapse of the Bear Stearns Investment Bank in March 2008, which led to fears of a worsening of the global crisis, and following the collapse of Lehman Brothers in September 2008. As presented in Table 3.2, in each of these three cases the expansion as well as the contraction of the spreads was gradual, and they remained at a higher level than before summer 2007. In itself, the expansion of the spreads, which also matched developments in the global financial markets, is explained as part of a renewed process of risk assessment and pricing, and also possibly as exploitation of the market power by the banks, which was boosted by the paucity of nonbank sources of credit. The interest rate cuts following the events of September 2008 resulted, *inter alia*, from the intention to reduce the price of credit to the public against the background of the previously mentioned developments in the credit market.

The interest rate cuts following the events of September 2008 were a reaction to the fall in the inflation environment, and also to the credit difficulties that started to appear.

This reference to considerations of financial stability naturally leads to the question of whether interest rate decisions should, as a matter of principle, take such considerations into account. As with other issues, here too reality has preempted the

[8] xpected developments in real activity are relevant to the discussion of monetary policy because of their impact on inflation as well as in their own right, since they themselves are affected by monetary policy and due to their importance for the Israeli economy. For a discussion of whether it is appropriate to present the central bank with activity targets as well as the inflation target, see: A. Cukierman (2008), "Should the Bank of Israel have a growth targets? What are the issues?" *Israel Economic Review, Vol 4, No.2*.

[9] See the Bank of Israel, *Recent Economic Developments* 119, for the period April-September 2007.

academic literature. Central banks worldwide, including the Bank of Israel, tend to take financial stability considerations into account. This approach is based, *inter alia*, on understandings regarding the pass-through mechanisms of monetary policy, via which this policy also affects the risk premium in the financial market (and not only the price of risk-free credit):[10] Since a lower interest rate increases the value of firms' and households' assets and discounted flows, it also increases the value of their collateral, which subsequently reduces their risk premium. The Bank of Israel's interest rate cuts in the last quarter of 2008 were heavily affected by the development of credit difficulties in certain sectors.

After ten years when the central bank had not intervened in the foreign-currency market,[11] in 2008 the Bank of Israel began to purchase foreign currency on a daily basis in the free market, intending to increase the country reserves. The timing for the operation of that purchasing program was selected according to the sustained and considerable appreciation of the NIS.

2. MONETARY POLICY

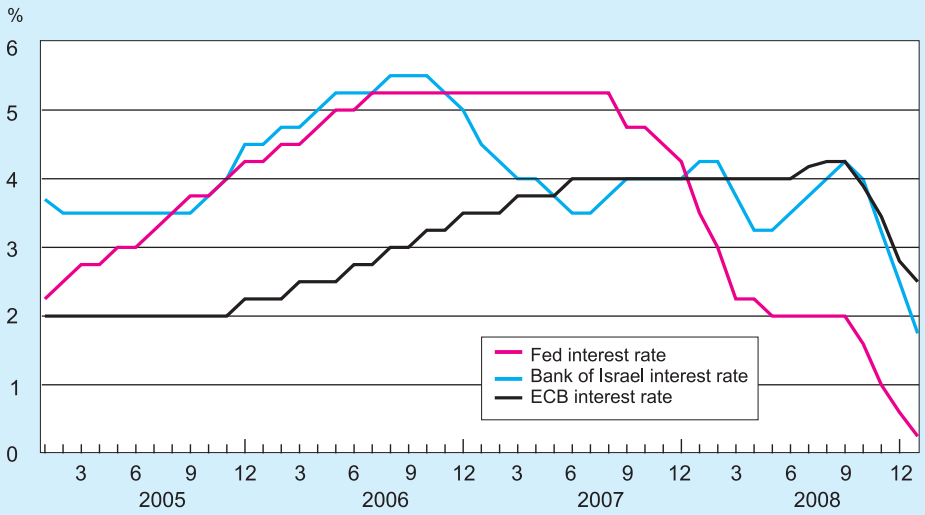
Since 2003 monetary policy has operated within the framework of a continuous inflation target within the range of 1 to 3 percent, which is defined as a price stability target. A multi-year target increases the transparency of monetary policy and its credibility, and helps to anchor inflation expectations within its limits, thereby facilitating the attainment of the target. The principal means employed by the Bank of Israel for attaining the target is the monetary interest rate, which affects the development of inflation via its impact on demand for private consumption and investment, on the cost of credit, on inflation expectations and on the exchange rate. For the purpose of making interest rate decisions, the Bank of Israel monitors the development of various economic indicators, including developments in the capital, money and foreign-currency markets, and in non-financial activity. The Bank of Israel also employs econometric models for forecasting inflation, and for assessing the interest rate path which is consistent with the attainment of the inflation target, on the basis of different scenarios of economic developments. Monitoring this range of developments enables the Bank of Israel to constantly examine the markets' reaction and its implications for inflation expectations, and to determine what it considers as the appropriate level of the interest rate for attaining the inflation target for the next year-two years while maintaining the stability of the financial and non-financial markets. The fiscal discipline of recent years, which was reflected *inter alia* by a decrease in the debt-GDP ratio, had the effect of reducing interest rate pressures and inflationary pressures

[10] See: Ben Bernanke (2007),. "The Financial Accelerator and the Credit Channel", speech at "The Credit Channel of Monetary Policy in the Twenty-first Century" conference, at the Federal Reserve Bank of Atlanta, Atlanta, Georgia, June 15, 2007.

[11] In 1997 the process of shifting from a managed exchange-rate regime to an inflation targeting regime was completed, and the exchange rate became completely flexible.

in the economy. But, as presented in Chapter 6 in the section on the public sector, in the first half of 2009 (until the budget is re-approved following the general election to the parliament and the formation of a new government), fiscal policy is expected to be restrictive despite the economic slowdown, and thereby to increase the burden on monetary policy, which in any case is approaching the lower limit of the nominal interest rate.

Figure 3.1
Short-Term Interest Rates in Israel, the US, and the Eurozone, 2005-January 2009 (monthly averages)



SOURCE: Bank of Israel, the Fed and the ECB.

During 2008 monetary policy reacted mainly to global shocks—the increase in world prices for oil and agricultural produce, and the effects of the global crisis. Apart from housing prices, inflation in 2008 appears to have been hardly affected by any substantial local factors, despite the decline in the unemployment rate, which brought the economy nearer to full employment in the first half, and despite the slowdown in the second half.

During 2008 monetary policy reacted mainly to developments stemming from global shocks.

Due to the Israeli economy's integration into the global economy and due to the unrestricted capital flows to and from the economy, the Bank of Israel took account of the implications of the developments expected in interest rates world wide. A rise in interest rates abroad increases the attractiveness of foreign assets; since the desire to move to foreign assets has a depreciative affect it also leads to inflationary pressures. A decline in worldwide interest rates has the opposite effect. Accordingly, the Bank of Israel responds with the interest rate instrument also to developments in worldwide interest rates (Figure 3.1). In the USA, the source of the crisis, the interest rate was cut

because of the crisis and despite high inflation there, in Europe it remained unchanged until September and was subsequently reduced, and in the emerging markets the trend was mixed, with an upward tendency until September and downwards thereafter.

The interest-rate decisions taken during the course of the year were influenced by the risk that the global crisis would affect Israel, via a number of channels[12], and to a great extent. As a matter of fact, indicators during the year showed that this risk materialized to an only partial extent and more gradually than expected until September, and more notably thereafter. Until May, the interest rate was cut in view of an assessment that the downturn in activity and inflation would be more rapid and more substantial than actually occurred (Table 3.2). As presented in Chapter 2 on real activity, the slowdown in non-financial activity only became apparent to a significant extent in fourth quarter data. Over time, it transpired that the turnaround in local activity was more gradual than in the USA and Europe, the downturn in inflation was slow to materialize, and inflation expectations continued to rise. From June onwards therefore, the Bank of Israel increased the interest rate again (Table 3.2). This was also in order to prevent the credibility of monetary policy from being eroded, a development that could have led to an upsurge in inflation and to a worsening of the effects of the global crisis. From September, the dramatic worsening of the global crisis, which was already serious, impacted the financial system in Israel, as detailed more extensively in Chapter 4. Concurrent with the deterioration in financial activity, indicators of a slowdown in non-financial activity became apparent in the last quarter as a result of the worsening of the financial crisis, and due to previous real developments whose effect was gradual. All this led to another turnaround in the course of the interest rate: from September the interest rate was cut substantially, to the accompaniment of a number of exceptional policy measures, which will be discussed later.

One of the most important indicators serving as a basis for interest-rate decisions is the development of inflation expectations for the term of a year. During the first half of 2008, inflation expectations (the expectations derived from capital market data for a term of twelve months ahead) rose from a rate of 2.5 percent, at the upper limit of the inflation target, to a rate of 3.2 percent, above the upper limit (Table 3.2). Private analysts' forecasts evolved in a similar manner. Against this background, expectations of an upturn in the interest rate emerged as well. The rise in inflation and interest rate expectations were influenced by the fact that the downturn in activity and inflation was slower than assessed within the framework of the interest-rate decisions at the time; it is also possible that the interest rate decisions in that period were not explained to the public with sufficient clarity, and therefore the credibility of monetary policy may have eroded to some extent. In August the trend changed, and expectations began to fall as a result of the decline in world prices for energy and agricultural produce, and also possibly due to the Bank of Israel's interest-rate hikes. Following the events of September 2008, the downturn in inflation expectations for twelve months ahead

[12] These were reviewed in Section 1 above, Main Developments.

Table 3.2
Nominal and Real Interest Rates, Inflation Expectations, and Price Increases, 2007-08 (period average, percent)

	Bank of Israel key interest rate[a]	The Bank of Israel's effective interest rate[b]	Effective interest on overdrafts	Difference between interest on overdrafts and Bank of Israel effective interest rate	1-year inflation expectations		Derived real interest[d]	Real yield to maturity on		Inflation over previous 12 months (Change in CPI)
					From capital market[c]	Forecasters' average		1-year CPI indexed treasury bills[e]	10-year CPI - indexed treasury bills[e]	
2007	3.94	4.01	9.9	5.7	1.4	1.9	2.7	2.9	3.3	0.6
January	4.50	4.59	10.0	5.1	1.1	1.7	3.5	3.5	3.4	0.1
February	4.25	4.33	9.9	5.3	1.4	1.9	2.9	3.0	3.2	-0.8
March	4.00	4.07	9.7	5.4	1.3	2.0	2.7	2.9	3.3	-0.9
April	4.00	4.07	9.6	5.3	0.5	1.7	3.6	3.4	3.1	-1.2
May	3.75	3.82	9.7	5.6	0.7	1.2	3.1	2.9	2.9	-1.2
June	3.50	3.56	9.4	5.7	1.9	1.9	1.7	2.0	3.1	-0.6
July	3.50	3.56	9.8	6.0	2.0	2.7	1.6	2.1	3.3	0.4
August	3.75	3.82	0.1	6.0	1.7	2.6	2.1	2.8	3.7	1.1
September	4.00	4.07	0.3	6.0	1.2	1.7	2.9	3.3	3.7	1.4
October	4.00	4.07	0.2	5.9	1.2	1.6	2.8	3.1	3.4	2.2
November	4.00	4.07	0.1	5.8	1.4	1.9	2.7	3.0	3.4	2.8
December	4.00	4.07	9.8	5.8	1.9	2.4	2.2	2.6	3.5	3.4
2008	3.65	3.73	9.8	5.9	1.9	2.5	1.8	1.9	3.4	4.6
January	4.25	4.33	0.4	5.8	2.5	2.6	1.8	2.3	3.5	3.5
February	4.25	4.33	0.5	5.9	2.4	2.4	1.9	1.9	3.2	3.6
March	3.75	3.82	9.9	6.0	2.6	2.6	1.1	1.1	3.1	3.7
April	3.25	3.30	9.7	6.1	2.7	2.8	0.6	1.0	3.2	4.7
May	3.25	3.30	9.2	5.7	2.7	3.2	0.6	1.4	3.2	5.4
June	3.50	3.56	9.5	5.7	3.0	3.1	0.6	1.3	3.2	4.8
July	3.75	3.82	9.7	5.6	3.2	3.1	0.6	1.2	3.3	4.8
August	4.00	4.07	0.2	5.9	2.7	3.0	1.4	1.7	3.3	5.0
September	4.25	4.33	0.4	5.8	2.1	2.8	2.2	2.2	3.4	5.5
October	3.75	4.06	0.1	5.9	0.3	2.0	3.6	3.1	3.9	5.5
November	3.25	3.32	9.4	6.0	-0.1	1.3	3.4	3.2	4.1	4.5
December	2.50	2.53	8.9	6.2	-0.7	0.5	3.3	2.8	3.4	3.8

[a] By liquidity month.
[b].Effective interest; in annual terms.
[c] Based on a zero curve.
[d] Nominal interest rate on Bank of Israel auctions *minus* inflation expectations.
[e] Smoothed curve of *Galil* yields - zero curve..
SOURCE: Research Department, Bank of Israel and Central Bureau of Statistic data.

increased, and within a short space of time these even dipped to negative rates[13] (Figure 3.2 and Figure 3.3). At the same time, expectations emerged of a monetary policy that would react to the large decline in the inflation environment, as well as to developments in non-financial and financial activity. Expectations of a downturn in the interest rate during the fourth quarter therefore derived from the Bank of Israel bills (*makam*) curve and from private analysts' forecasts.

The large changes in inflation expectations in the course of the year had a marked effect on the implied real interest rate on Bank of Israel sources, which did not always develop in the manner intended by those managing monetary policy.

Due to the evolution of inflation expectations in the course of the year, the implied real interest rate on Bank of Israel sources did not always develop in the manner intended by those managing monetary policy. Table 3.2 and Figure 3.2 show that the implied real interest rate fell to a low level before September (to 0.6 percent, the lowest level ever) even in periods when the monetary interest rate was raised; the table and the diagram also show that after September, as a result of the sharp decline in inflation expectations to a negative rate, the implied real interest rate rose sharply (to 3.5 percent) despite the large cuts in the monetary interest rate. In unusual circumstances, such as in the present crisis, policymakers may be interested in a particularly low or even negative real interest rate. A negative real interest rate is obtained when the rate of inflation expectations exceeds the nominal interest rate. Since the latter must be positive, it is vital that the rate of inflation expectations be positive. As apparent from Figure 3.2 however, periods existed when the rate of inflation expectations was considerably less than the lower limit of the target. The need to ensure that the inflation rate will be positive even in such extreme circumstances is one of the justifications for maintaining a positive inflation target.[14]

In March 2008, the Bank of Israel started implementing a program aimed at increasing Israel's foreign exchange reserves by direct purchases in the market.

In March 2008, Bank of Israel started implementing a program aimed at increasing Israel's foreign exchange reserves by direct purchases in the market.[15] The foreign exchange reserves serve as a liquidity source in a need, and the economy gains utility from holding them, as they reduce the probability of a crisis in the FX market and increase Israel's status and reputation in the international financial environment. The functions of the reserves are defined by the optional use that the government and the Bank of Israel can make of them; these functions also serve to determine the desired level of the reserves.[16] In early 2008, after a comprehensive examination of the desired level of the reserves, the Bank of Israel decided to increase them. This was due to the needs of the economy in light of the accelerated GDP growth in recent

[13] Part of this decrease could be attributed to differences in tradability between CPI-indexed bonds and unindexed bonds, whereby the differing yields between the different types of bonds do not reflect inflation expectations alone.

[14] For an explanation of this justification for and a discussion of a positive, albeit low, inflation target, see: Roberto M. Billi and Kahn A. George (2008), "What is the Optimal Inflation Rate?" Federal Reserve Bank of Kansas City, Economic Review, second quarter.

[15] Two days in March prior to the implementation of the purchasing program, the Bank of Israel purchased foreign currency in the market, in light of unusual movements in the shekel exchange rate.

[16] For a detailed discussion of the management framework of the reserves in general and the desired level in particular, see previous years' annual reports of the Foreign Exchange Department. For the desired level, see the report for 2007; for definitions of the optional uses in the reserves, see the report for 2005.

years, and in light of Israel's growing integration in the global economy and in the global financial system. The timing of the implementation of the purchasing program was determined in light of the sharp and continuous appreciation of the shekel, so that purchases could be made when this was consistent with other objectives of the monetary policy. Therefore, in late March 2008 the Bank of Israel started purchasing foreign currency in the market. Thus, during 2008, as part of the reserves-increasing program, $12.1 million was purchased, mostly in the second half of the year, during which the Bank of Israel increased the purchasing rate from $25 million to $100 million a day. At the end of the year the Bank of Israel announced that it would keep purchasing during 2009 as well, and will assess the program from time to time, in light of the changing market circumstances.

Economic developments in 2008 reflected the growing maturity of the Israeli economy since the 1985 stabilization program and until now.[17] During the 1980s and 1990s, severe shocks in the international financial markets, expressed by a large decrease in capital flows into the emerging markets and a much slower expansion in activity and international trade, forced the Bank of Israel to adopt a policy of monetary restraint in order to counter-balance the effect of increased risk on financial stability and the exchange rate. This was due to the economy's fundamentals, which amplified the impact of the external shocks, and the high pass-through from the exchange rate to the price index. This was the case, for example, in the last two crises preceding the present one: the emerging markets' currency crisis in 1998 occurred only a short time after the Israeli economy had moved to a flexible exchange rate regime, and the global recession at the beginning of the decade led in 2002 to a loss of confidence in fiscal policy because it was based on an unrealistic forecast of tax revenue.[18] In both these cases of external shocks whose impact was amplified due to local circumstances, the Bank of Israel was forced to raise the interest rate (thus increasing the differential relative to interest rates abroad) in view of the outflow of capital and the large depreciation of the shekel. In contrast, the Israeli economy entered the present crisis with good fundamentals—relative to the past and relative to worldwide standards—and these restrained the impact of the shocks on the economy and even led to pressures for an appreciation. Accordingly, and in contrast to previous crises which originated from exogenous factors as well, in the present crisis the Bank of Israel is reducing the interest rate while purchasing foreign currency. Not only the development of the interest rate reveals a change with respect to the policy that was adopted in previous crises; so does the development of the spread relative to interest rates abroad. Figure 3.1 shows that in the wake of the crisis the Bank of Israel's interest rate developed in a manner similar to that of the ECB, after the spreads between them had contracted and vanished by the end of 2006. Although a comparison with the USA reveals a different picture, an expansion of the spread, it should be remembered that the source of the

The Israeli economy entered the present crisis with good fundamentals—relative to the past and relative to worldwide standards.

[17] See: H. Barkai and N. Liviatan. (eds.), The Bank of Israel: Volume I, A Monetary History, Oxford University Press (2007).

[18] See the Bank of Israel Annual Reports for the years 1998 and 2002.

crisis is within the USA, and large cuts were made in the interest rate there against this background. Apart from the difference between the factors causing the crisis and the characteristics of the crisis, as well as the substantially reduced pass-through from the exchange rate to the consumer price index, today's monetary policy differs from that adopted in the past due to the historically low inflation environment, the current account surplus, continued fiscal discipline and the declining trend of the debt/GDP ratio. Together with the Bank of Israel's continued purchases of foreign currency, the fact that the "flight to safety" was expressed by the growth in demand for *Shahar* and *Galil* bonds[19] reflected monetary policy's high degree of credibility; this differs from previous years, when crises actually led to increased demand for foreign assets and to a large depreciation as a result.

Policy decisions in the first period (until September)

Up to September, the course of the interest rates changed three times.

This period, when the course of the interest rates changed three times, began and ended with an interest rate of 4.25 percent:

- The interest rate for January was raised by 0.25 percentage points to 4.25 percent, and remained unchanged for February. The interest-rate decisions for these months were affected by the surprisingly high inflation in the last months of 2007, which resulted from the upsurge in oil and commodity prices in world markets, and by indications of excess demand in the economy.
- For each of the months March and April the interest rate was cut by 0.50 percentage points to 3.25 percent, despite the high inflation environment prevailing at the time. The rate cuts, which came as a surprise to the market, were motivated by two main considerations. One consideration was concern over a worsening of the global crisis and its potential implications for the Israeli economy. It was believed that the global slowdown would change the trends in commodity prices, and these, together with the slowdown in Israel, would reduce inflationary pressures. All this actually occurred, but later than expected. The second consideration was the large and continued appreciation of the shekel. In mid-March, the Bank of Israel intervened in foreign currency trading for the first time in a decade due to unusual developments of the exchange rate in the course of trading, which was identified as a market failure. At the end of that month, the Bank of Israel started implementing a program for increasing the foreign exchange reserves by means of direct purchases in the course of trading against the background of the appreciation of the shekel. It was initially decided to purchase at an average daily amount of $ 25 million. On July 10 the amount of daily purchases was increased to $ 100 million, in light of further appreciation of the shekel.
- The interest rate for May was left unchanged. From June, the rate was increased in four consecutive steps by 0.25 percent in each month to 4.25 percent.

[19] Unindexed and CPI-indexed government bonds, respectively.

Supporting the rate hikes were three principal considerations: (1) The large and surprising increase in actual inflation as well as the rise of inflation expectations, due to the increases in energy and commodity prices. (2) Assessments that the global crisis would be less severe than previously expected. (3) Assessments that the economy was approaching a full employment environment, and that the slowdown would come later than initially expected.

Policy decisions in the second period (after September)

The worsening of the global crisis following September's events shook the domestic financial market and led to growing signs of credit difficulties in certain sectors: Interest margins in the unindexed local currency segment expanded, and financing difficulties increased in all the principal industries.[20] After the events of September 2008, the expansion of interest margins supported a reduction in the Bank of Israel's interest rate for the purpose of reducing the cost of credit to the business sector and to households. Apart from the rate cuts, the Bank of Israel announced a series of monetary measures that were aimed at increasing the liquidity in the financial system. These measures, which were decided at the end of the year and whose implementation began in 2009, are detailed in the last section of this chapter, which discusses monetary policy instruments.

After September, the Bank of Israel made large cuts in the interest rate, to its lowest levels ever.

During the period in question the Bank of Israel made large cuts in the interest rate, to its lowest level ever. In that period, from September to December, the rate was cut four times, twice in unscheduled decisions, from 4.25 percent to 2.50 percent. This trend continued at the beginning of 2009:

- At an inter-meeting decision on October 7, the rate was cut by 0.50 percentage points, effective from the 11th of that month. On the next day, in a measure that was coordinated by the world's leading central banks—the Fed, the ECB and the Bank of England among others—the interest rate was cut by 0.50 percentage points.
- A decision was made to cut the interest rate for November by 0.25 percentage points.
- In a second inter-meeting decision on November 11, it was decided to cut the rate by 0.50 percentage points, effective from the 14th of that month.
- A decision was made to cut the interest rate for December by 0.50 percentage points to 2.50 percent.
- Subsequently, for the months of the first quarter of 2009, additional cuts were made in the interest rate to its lowest level ever: for January 2009 the rate was cut to 1.75 percent, for February it was cut to 1 percent, and for March it was reduced to 0.75 percent. The proximity of the monetary interest rate to its zero lower bound led to the employment of additional policy instruments. Thus, in February 16, 2009, the Bank of Israel announced it would start intervening in

[20] See the Bank of Israel's Companies and Businesses Survey for the fourth quarter of 2008.

the secondary market for government bonds, to influence longer-term interest rates.

Some of the interest rate cuts in 2008 came as a surprise to the public, due to their size or to their timing.

Some of the interest rate cuts in 2008 came as a surprise to the public, due to their size or to their timing: the extent of the 0.50 percent rate cut for March and April surprised the markets in view of their size, and two of the rate cuts in the last quarter came as a surprise in view of their timing. Although surprise decisions can be effective, they involve a cost. Decisions made at unexpected times are likely to be perceived as an expression of resoluteness, and can therefore restore impaired credibility. However, a surprise move during a period of crisis and growing risk can lead to the feeling that certain risk factors are known to policymakers but are unknown to the public, a feeling that could increase the public's perception of risk even if this is unjustified. Surprises can also harm policymakers' credibility and impair the ability to influence the public's expectations, bearing in mind that the ability to influence the public's expectations is one of the central bank's most important instruments for managing monetary policy. For these reasons, the Bank of Israel usually refrains from taking unexpected measures. The unexpected rate cuts of March and April were intended to prevent expectations for a future reduction in the interest rate, expectations that could have led to a further appreciation as the result of capital inflows. (These rate cuts were made before the bank started implementing the foreign currency purchase program.) The unscheduled rate cuts in the fourth quarter derived from extreme events, which occurred at a pace that created a sense of urgency regarding the need to react.

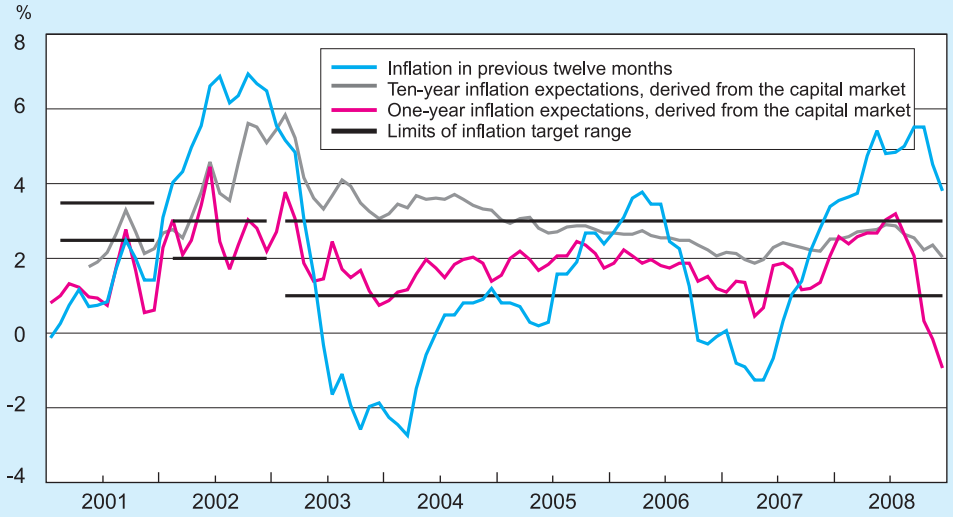
3. PRICES

Inflation in 2008 exceeded the upper limit of the target, and amounted to 3.8 percent. As can be seen from Table 3.3 and Table 3.3 however, the development of inflation in the course of the year was not uniform. The first half was notable for a high inflation environment, while the inflation environment in the second half of the year was considerably lower. This development resulted from global developments and local factors.

Since 2003 inflation has been targeted within a band of between 1-3 percent following a decade of a disinflation process which included a reduction in the inflation target. Figure 3.3 shows that inflation, from the perspective of the previous twelve months, has usually deviated from the target, generally in a downward direction.[21]

[21] Accordingly and in view of the development of inflation during the period of disinflation, studies were directed at the question of whether this asymmetry is derived from asymmetry in policy-makers' preferences, or from asymmetry in exogenous shocks. The explanation of precautionary prevention of upward deviation from the inflation target was studied by A. Barnea and J. Djivre (2004), "Changes in Monetary and Exchange Rate Policy and the Transmission Mechanism in Israel, 1989.IV-2002.I" Bank of Israel, Research Department, Discussion Paper No. 2004.13. The explanation of asymmetric preferences was studied by W. Nagar (2007), "Asymmetry in Monetary Policy: An Asymmetric Objective Function and a New-Keynesian Model," Bank of Israel, Research Department, Discussion Paper 2007.02.

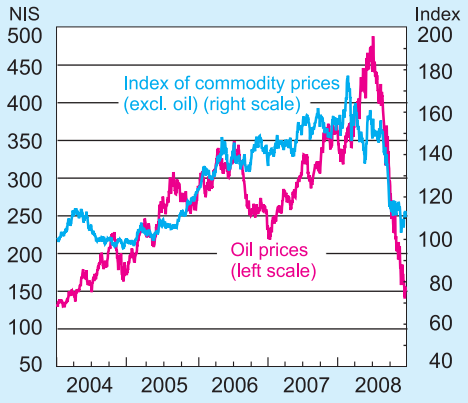
Figure 3.3
Inflation in Previous Twelve Months, Inflation Expectations, and the Inflation Target, 2001-08 (monthly averages)



SOURCE: Based on Central Bureau of Statistics data.

Since 2003 the first significant upward deviation occurred at the end of 2007. The combination of substantial shocks and a flexible inflation-targeting regime, whose effect is a gradual one, are likely to continue leading to deviations from the inflation target from time to time.[22] Moreover, the practice in monetary policy is to avoid stabilizing inflation by means of strident policy measures. This is because the rectification of a deviation in inflation via the creation of a reverse deviation in the following months is neither practical nor desirable. Such a practice would be comparable to repairing storm damage by creating a similar storm in the opposite direction.

Figure 3.4
Index of Commodity Prices,[a] and Oil Prices, 2004-08 (daily data)



[a] Index of shekel prices.
SOURCE: Based on Bloomberg.

[22] Nevertheless, in view of the weakening of the pass-through from the exchange rate to prices, it is reasonable to assume that the volatility of inflation, and with it the deviations from the targeted range, will decrease during the coming years. With respect to the weakening of the pass-through in Israel, see: Bank of Israel Report 2007, Chapter 3, Box 3.2, "The Dissociation of the Housing Prices from the NIS/Dollar Exchange Rate"; and Box 3.3, "Pass-Through effect from the exchange rate to inflation—comparison with emerging and advanced economies that adopt inflation targeting."

Central banks therefore endeavor to increase certainty regarding the future price environment (forecast targeting) by gradually restoring inflation to within the targeted range.[23]

The development of energy and agricultural produce prices in the world market led to high inflation in the first half of the year, and to its moderation in the second half.

One of the exogenous factors that had a considerable impact on the course of inflation during the year was the development of energy and agricultural produce prices in the world market. Figure 3.4 presents the rise in energy and commodity prices since the beginning of the last business cycle in 2003, including the upsurge in this increase since mid-2007 and until the turnaround that occurred in mid-2008. It can be seen that the large increases during the first half of the year were only slightly offset by the strengthening of the shekel against the dollar in the same year. The diagram also shows that in the second half of the year these prices fell heavily. **During the first half**, despite the downturn in global activity, oil prices continued to rise sharply, leading to high inflation in energy items worldwide. Although the upturn in the prices of agricultural commodities ceased at the beginning of the year, food prices continued to rise, in a delayed reaction to the previous increase in the prices of food inputs. **In the second half** a turnaround occurred: The global slowdown led to large decreases in the prices of oil and agricultural commodities, and the inflation environment worldwide, Israel included, began to decline gradually. Despite the major contribution of energy prices to the high inflation during the first half, their impact on annual inflation amounted to a negative contribution. This was not the case with food prices (excluding fruit and vegetables), which appear to act with a longer lag to the development of raw material prices. As a result, their contribution to annual inflation was substantial, as will be detailed later.

Table 3.3 presents the contribution of imported-goods prices to the development of inflation during 2008. It can be seen that imported-input prices rose rapidly during the first half of the year and fell even more rapidly in the second half, a development that was reflected *inter alia* by the shekel price of fuel, which is also presented in the table. This is in contrast to the shekel price of imported consumer goods, which fell in the first half and rose in the second half, because their price, when denominated in the producer's currency, is more stable. As a result, their price, denominated in shekels, was mainly affected by the development of the nominal exchange rate. The table highlights the substantial contribution of fuel to the high inflation in the first half, as compared to its important contribution to the downturn in inflation during the second half. However, this decline was offset in the second half by large increases in the housing item.

With respect to the adjusted CPI, exclusive of the fuel, housing, and fruit and vegetable items, inflation can be divided into two components: imported consumer goods and goods produced in the local market (in whose production imported inputs are also used). Although no direct observations of these two components of inflation are available, Table 3.4 presents an estimate of their development in recent years on

[23] For a detailed discussion of forecast targeting, see: Svensson E.O. Lars (2003), "Monetary Policy and Real Stabilization", NBER W*orking Paper No. 9486*.

Table 3.3
The Exchange Rate, Import Prices, GDP Prices and Consumer Prices, 2002–08

(percentage changes)

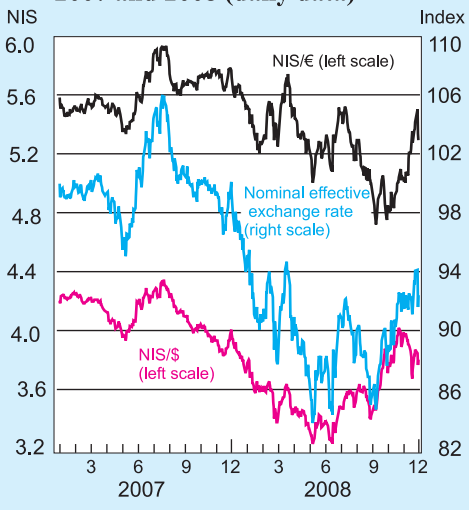
	Import prices ($)				Dollar exchange rate	Import prices[a] (NIS)				Business-sector product prices[a]	CPI		
	Consumer goods	Investment goods	Production inputs			Consumer goods	Investment goods	Production inputs			Total	Fuel	Excluding fuel
			Excl. fuel	Fuel				Excl. fuel	Fuel				
	(Change from to previous period, annual averages)												
2002	0.3	2.1	-1.1	0.8	12.7	12.9	15.0	11.0	13.5	4.1	5.7	6.7	5.7
2003	4.7	5.0	8.7	12.0	-4.0	0.4	0.7	3.5	7.6	0.9	0.7	9.2	0.5
2004	4.2	2.1	12.2	29.0	-1.4	2.8	0.7	6.6	27.2	-1.0	-0.4	8.9	-0.7
2005	0.9	-2.4	10.8	36.7	0.2	1.0	-2.4	3.0	36.7	1.3	1.3	11.8	0.7
2006	1.4	-1.1	7.7	17.6	-0.8	0.8	-1.8	3.0	16.8	1.8	2.1	9.6	1.8
2007	3.7	3.7	9.1	12.5	-7.7	-4.7	-4.5	0.2	4.3	-1.4	0.5	2.0	0.4
2008[b]	9.2	2.5	11.8	39.4	-12.7	-4.7	-10.5	-2.3	20.8	-1.3	1.6	6.7	4.4
	(Change from last quarter in previous year)												
2002	1.4	4.7	5.6	25.4	10.6	12.0	15.7	13.1	38.4	5.1	6.7	16.4	6.5
2003	6.8	4.2	8.5	7.5	-6.0	0.3	-2.2	2.0	0.9	-1.9	-2.1	2.0	-2.2
2004	2.8	1.0	15.7	45.7	-1.0	1.8	0.1	7.5	44.4	-0.6	1.0	16.6	0.5
2005	-2.2	-5.7	4.9	25.4	5.7	3.5	-0.3	3.8	32.5	3.6	2.6	12.9	1.9
2006	4.5	2.5	7.7	3.2	-8.4	-4.3	-6.1	-0.2	-5.5	0.6	-0.2	-3.3	0.0
2007	5.7	4.5	17.0	45.7	-7.4	-3.2	-3.4	1.9	37.0	0.8	2.8	15.1	2.2
2008[b]	6.9	-2.8	6.4	-33.6	-3.1	3.5	-5.8	3.0	-35.7	5.9	3.6	16.9	5.1
	(Change from previous quarter)												
2007													
I	0.3	1.8	1.2	-4.1	-1.0	-0.7	0.9	0.2	-5.0	-1.3	-0.3	-1.2	-0.4
II	0.8	0.6	2.2	18.4	-3.1	-2.5	-2.8	-1.2	14.5	1.7	0.8	10.1	0.4
III	0.6	0.4	2.8	10.0	2.8	3.3	3.0	5.6	12.9	0.5	1.9	2.3	1.9
IV	2.9	1.7	3.6	18.6	-6.1	-3.2	-4.4	-2.6	11.6	-2.0	0.5	3.4	0.3
2008													
I	4.0	1.8	3.0	12.5	-8.1	-4.4	-6.4	-5.4	3.4	-0.3	0.5	0.4	0.5
II	2.8	1.4	5.0	21.5	-5.6	-2.9	-4.2	-0.8	14.8	0.6	2.1	7.3	1.8
III	0.5	-1.8	1.9	1.3	1.9	2.5	0.2	4.0	3.3	0.7	2.0	3.9	1.9
IV[b]	-0.5	-4.2	-3.4	-52.0	9.6	9.0	5.0	5.8	-47.4	3.8	0.0	-16.4	0.8

[a] The change in dollar import prices of goods (excluding fuel) multiplied by the NIS/$ exchange rate.
[b] Import prices for fourth quarter are estimates.
SOURCE: Based on Central Bureau of Statistics data.

the basis of an econometric model that was developed at the Bank of Israel.[24] This estimate shows the turnaround in the development of the local price of imported consumer goods, from a large decrease in the first three quarters (5 percent) to a large increase thereafter (4 percent). As stated, this development mainly resulted from the development of the nominal exchange rate. Since the inflation observed in the adjusted index is a weighted average of both these components, each one of them is a reflection of the other; therefore, according to the same estimate, the price of the domestic component actually rose during the first three quarters. This resulted mainly from the increase in the price of imported inputs, but also possibly from real activity, as growth was still high in the first half and slowed down thereafter. It should be noted that these estimates do not take into account the potential decline in the pass-through from input prices or from the exchange rate, to the final price to the consumer. Such a decline, if it did indeed occur, can be attributed *inter alia* to the continued appreciation of the shekel in 2006, which may have had the effect of slowing the pace of shekel price adjustment because the large appreciation was assessed as temporary.[25]

The development of the prices of domestically produced goods during the year (Table 3.4) mainly reflects, as stated, the development of the prices of imported inputs, although it can to some extent also be attributed to the development of the nominal unit labor cost. Table 3.5 shows that during the first three quarters, this cost was affected by wage increases in both the business and public sectors. These derived *inter alia* from an exhaustion of the increase in the degree of labor utilization, which brought the labor market to a full employment environment (the closure of the output gap).[26] However, the demand side, whose rapid expansion in the first half was the fundamental power behind this development, began to slow in the second half. Although this turnaround has yet to be reflected in official unemployment data to the end of the year,[27] it seems that

Figure 3.5
NIS/$ and NIS/€ Exchange Rates, and the Index of the Nominal Effective Exchange Rate, 2007 and 2008 (daily data)



SOURCE: Bank of Israel.

[24] See Box 3.2 in the Bank of Israel Report for 2006.

[25] Evidence of adjustment in the pass-through over time in Israel, regardless of the issue of the housing item, is presented by Yoav Sofer (2006). "Exchange-Rate Pass-through to the Consumer Price Index: A Micro Approach," Bank of Israel, Foreign Exchange Discussion *Paper*, October 2006.

[26] During the first three quarters, the shortage of skilled workers was the principal supply-side restraint, a phenomenon that ceased in the fourth quarter. See Chapter 5, which discusses the labor market.

[27] As detailed in Chapter 5 on the labor market.

Table 3.4
Evolution of the Domestically Produced Component of the CPI vis-à-vis the Imported Component, 2002–08

(percent)

	CPI	Housing prices	Fuel prices	CPI excluding housing fuel, fruit and veg.	Estimated Price of domestically Produced goods[a]	Estimated prices in Israel of imported consumer goods[b]	World import prices of consumer goods in dollar terms[b]	NIS/$ exchange rate	Real effective exchange rate
					(change during the year)				
2002	6.6	9.5	16.4	5.7	0.8	13.4	1.3	10.6	12.6
2003	-2.2	-7.3	2.0	-0.7	0.0	-1.8	6.8	-5.9	7.7
2004	1.0	-1.7	16.6	1.4	-0.3	4.0	2.7	-1.0	5.7
2005	2.6	3.6	12.9	1.2	0.7	1.9	-2.1	5.6	0.2
2006	-0.2	-5.2	-3.3	1.0	2.7	-1.5	4.5	-8.6	-1.1
2007	2.8	1.8	15.1	2.1	5.7	-3.5	4.7	-7.4	-1.3
2008	4.6	9.7	-6.4	3.8	6.7	-0.8	6.8	-2.2	-9.8
					(change from previous quarter)				
2006									
I	0.6	1.1	-0.2	0.7	0.0	1.7	1.0	0.4	2
II	0.7	-1.6	6.4	0.7	1.3	-0.2	1.2	-3.6	-1.4
III	-0.1	-2.0	2.0	0.1	0.8	-1.0	1.9	-2.5	-1.7
IV	-1.4	-2.9	-9.5	-0.5	0.6	-2.1	0.3	-2.9	-0.8
2007									
I	0.2	0.4	-0.1	0.2	1.1	-1.2	0.3	-1.0	0.7
II	0.2	-0.7	8.0	0.1	1.3	-1.7	0.8	-3.1	-0.9
III	1.9	4.2	2.6	0.9	1.3	0.4	0.6	2.5	2.5
IV	0.4	-1.8	4.5	0.8	1.9	-0.9	2.9	-5.8	-2.2
2008									
I	1.0	-1.1	1.4	1.4	2.8	-0.8	4.0	-8.0	-6.2
II	1.5	0.7	5.0	1.6	4.9	-3.4	2.8	-5.7	-4.2
III	2.1	4.5	4.3	1.1	2.3	-0.7	0.5	2.1	-1.4
IV	-0.1	5.7	-14.4	-0.4	-3.2	4.1	-0.5	9.4	-1.0

[a] Prices of the domestic production component of the CPI (excluding housing and fuel) which also uses imported inputs. Bank of Israel estimates.

[b] Prices of the imported component of the CPI excluding housing, fuel and fruit and vegetables. Bank of Israel estimates.

SOURCE: Based on Central Bureau of Statistics data.

it led to a new trend in the development of wages and with it, to a slower increase in unit labor cost. Such a development is consistent with the estimate of the domestically produced goods prices presented in Table 3.4, according to which they slowed during the second half.

The increase in the price of domestically produced goods during the first half of the year was one of the causes of the large appreciation reflected by the real effective exchange rate in that period, and in turn was one of the forces that led to the downturn

Table 3.5
Nominal Labor Costs per Unit of GDP, Unemployment Rate, and Prices, 2001–08
(percent)

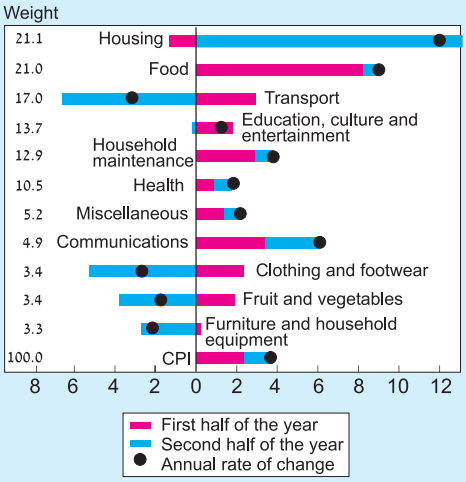
	Wage per employee post		Business-sector product	Nominal unit labor costs in business sector[a]	CPI	Unemployment rate[b]
	in business sector	in public sector				
	(average annual change over previous year)					
2001	4.4	3.7	-1.6	6.3	1.1	9.3
2002	-1.4	1.1	-2.4	0.7	5.7	10.3
2003	-1.8	-3.5	2.4	-5.2	0.7	10.8
2004	1.1	4.2	6.8	-3.5	-0.4	10.3
2005	3.7	1.8	6.1	1.5	1.3	9.0
2006	3.8	2.5	6.4	2.2	2.1	8.4
2007	1.9	2.8	6.2	1.0	0.5	7.3
2008	2.5	3.7	6.2	1.8	1.6	6.1
	(change from same quarter in previous year)					
2005						
I	2.8	-5.2	6.1	0.5	0.8	9.2
II	3.4	8.1	6.3	1.5	0.3	8.9
III	4.5	7.6	4.9	3.8	1.7	8.9
IV	4.2	-2.4	7.1	0.3	2.6	8.9
2006						
I	4.8	1.5	6.8	2.7	3.1	8.8
II	4.0	4.7	9.0	-0.7	3.6	8.8
III	3.2	2.0	5.6	1.9	2.0	8.3
IV	3.4	1.6	4.3	5.0	-0.2	7.8
2007						
I	1.6	2.2	6.3	0.3	-0.6	7.8
II	2.4	2.6	4.3	3.2	-1.1	7.6
III	2.0	1.4	6.2	1.6	0.9	7.2
IV	1.4	5.1	8.1	-0.9	2.8	6.6
2008						
I	4.0	5.8	6.1	3.2	3.6	6.2
II	4.6	4.3	5.8	3.5	5.0	6.0
III	3.3	4.1	5.0	1.9	5.1	6.0
IV	2.3	1.6	1.2	1.7	4.6	6.3

[a] Wage per employee post as reported to the National Insurance Institute, adjusted by real GDP.
[b] Average during the period.
SOURCE: Based on Central Bureau of Statistics data.

in these prices in the second half.28 However, in spite of the decrease in the cost of production factors (imported inputs as well as the unit labor cost) in the second half, the price estimate for domestic production fell only gradually because it implied

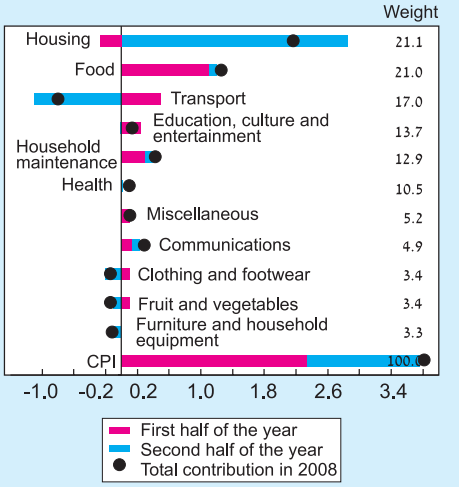
[28] An analysis presented in Chapter 2 (Box 2.2) shows that this rate appreciated excessively in 2008, implying a downward deviation from the equilibrium level. Such a deviation reflects the decline in domestic producers' competitiveness and together with the slowdown in global activity, it had the effect of reducing demand for domestic production.

Figure 3.6a
Rates of Change in the Components of the CPI, 2008 (percent)



SOURCE: Based on Central Bureau of Statistics data.

Figure 3.6b
Contribution of the Components of the CPI to Total CPI Inflation, 2008 (percent)



SOURCE: Based on Central Bureau of Statistics data.

the assumption that part of the prices are updated with a lag and are adjusted to inflation from the recent past. A number of studies provide empirical support for this assumption.29

In the first half of the year there was real appreciation of the shekel, due to the low rate of unemployment and to nominal appreciation, against the background of capital inflows to Israel. In the second half of the year these variables changed direction, and the rate of appreciation moderated.

Figure 3.5 presents the development of the exchange rate of the shekel against the dollar, showing an appreciation trend in the first half and a depreciation trend in the second half, quite the opposite to the development of inflation as a whole and the development of the domestic component in particular. The combined effect of these developments in inflation and in the nominal exchange rate was reflected by a real appreciation in the first half, which became more moderate in the second half (Table 3.4). Box 2.2 (in Chapter 2, GDP, Uses and Principal Industries) presents the claim that although long-term forces did indeed contribute to the real appreciation in the first half, the actual real appreciation was excessive due to the impact of additional, short-term forces. The real appreciation in the first half reflected pressures from two different sources: (1) The rapid growth in the economy and the exhaustion of the increasing utilization of production factors together with the onset of the global slowdown, created pressures for a real appreciation; (2) The capital flows into the economy, which since mid-2007 had been perceived as attractive because it had suffered from the global slowdown to an only moderate extent by world standards, led to a large nominal

[29] See: Sigal Ribon (2004), "A New Phillips Curve for Israel", Bank of Israel Research Department Discussion Paper 2004.11; Eyal Argov and David Elkayam (2007), "An Estimated Neo-Keynesian Model for Israel," Bank of Israel, Monetary Studies, 2007.08; and Alon Binyamini (2007), "Small Open Economy New-Keynesian Philips Curve: Derivation and Application to Israel," Israel Economic Review Vol.5, No.1 pp. 67-92.

Table 3.6
Price Developments, 2001–08

	CPI	Fruit & vegetables	Food	Housing	Household maintenance	Clothing and footwear	Education, culture and entertainment	Health	Transport and communications	Core index[a]	Index of controlled and supervised products	Wholesale price index of industrial production[b]
						Year-end, percentage annual change						
2001	1.4	6.9	1.1	5.2	0.9	-5.7	-0.3	6.0	-0.5	0.2	1.5	0.5
2002	6.5	-1.2	4.9	8.2	10.7	-3.5	3.5	5.7	9.3	6.9	7.3	5.6
2003	-1.9	4.2	0.3	-6.7	0.0	-4.0	-0.5	-0.4	-0.6	-0.3	-0.6	2.9
2004	1.2	6.0	1.8	-2.5	5.6	-4.2	-0.6	3.3	3.3	2.5	2.6	5.2
2005	2.4	-9.6	2.0	5.9	5.1	-4.3	0.7	2.2	1.4	1.7	3.9	4.3
2006	-0.1	12.0	3.6	-6.1	-1.2	-1.7	1.2	1.8	0.0	1.4	0.3	7.9
2007	3.4	7.0	6.3	1.9	6.1	-0.7	1.5	1.9	4.2	3.8	5.7	6.7
2008	3.8	-2.0	9.1	12.1	3.9	-3.0	1.6	1.8	-2.0	1.3	4.9	3.0
						Percentage, monthly change						
2008												
January	0.0	7.2	1.2	-1.1	0.2	-6.1	0.0	0.4	-0.3	0.3	0.3	0.6
February	-0.2	6.4	1.4	-1.6	1.1	-7.3	-0.1	0.3	-1.0	0.0	0.6	0.4
March	0.3	-5.3	1.6	0.4	0.1	-4.9	0.4	0.0	1.0	0.9	0.5	1.2
April	1.5	5.1	1.5	1.1	0.7	6.9	1.5	-0.1	2.0	1.2	1.1	1.4
May	0.7	0.0	1.9	0.1	0.6	3.1	0.1	-0.1	0.7	0.8	0.6	1.1
June	0.1	-10.3	0.4	-0.2	0.2	12.1	-0.1	0.4	0.7	0.3	0.4	0.5
July	1.1	3.8	0.8	2.4	1.7	-8.0	1.0	0.4	1.5	1.0	1.1	1.0
August	0.8	4.7	-0.1	3.7	1.2	-8.6	1.2	0.0	-0.4	0.1	0.6	0.4
September	0.0	-0.9	0.3	1.9	0.2	-5.4	-1.5	0.9	-0.6	-0.4	0.0	0.1
October	0.1	1.9	0.6	0.8	0.0	5.1	-0.5	0.1	-1.1	-0.4	0.1	-0.5
November	-0.6	-4.4	-0.6	2.5	-1.5	2.1	0.0	-0.1	-3.5	-1.6	-0.6	-1.7
December	-0.1	-8.2	-0.3	1.7	-0.5	10.5	-0.4	-0.4	-0.9	-0.9	0.1	-1.5

[a] The CPI excluding housing, fruit and vegetables, clothing and shoes, and price-controlled products.

[b] Excluding fuel.

SOURCE: Central Bureau of Statistics data.

appreciation, which due to price rigidity upped the real appreciation.30 During the second half the direction in which all the variables developed changed, leading to a moderation of the real appreciation in that half.

The high inflation in 2008 reflected mainly rises in the housing, food and apartment maintenance components of the CPI.

Concurrent with moderate changes in the other items forming the CPI, three items were responsible for annual inflation deviating from the upward limit of the target in 2008, housing, food and apartment maintenance, as a result of the relative increase in the prices of the goods and services comprising these items. Table 3.6 and Figure 3.6 illustrate how the large rises in these items were not balanced by parallel decreases in other items. Overall therefore, the relative increase in their prices was reflected by a deviation of inflation from the upper limit of the target. Had it so desired, the Bank of Israel might have been able to permit a change in their relative prices in a lower inflation environment. Under a flexible inflation targeting regime however, the response to inflation deriving from supply shocks is likely to be more moderate than inflation deriving from demand shocks. This is intended to moderate the adverse effect on activity and is one of the aspects of a flexible inflation targeting regime, supporting additional economic objectives side by side with gradual convergence within the officially targeted range. Moreover, by expecting a decline in the prices of energy and commodities, which eventually materialized, the Bank of Israel assessed that inflation would converge within its targeted range within a few months. Accordingly, it refrained from adopting restrictive measures, especially since the impact of such measures is gradual in any case. A global crisis such as that which we are now experiencing highlights the advantages of a flexible inflation-targeting regime: When inflation deviates from the limits of the targeted range, the Bank of Israel takes action in order to restore it to within the range gradually, in order to reduce the potential adverse effect on real and financial activity.

The housing item, which has a 21 percent weighting in the CPI, rose by 12.1 percent during the year and contributed 2.5 percentage points increase in the general index, the largest contribution (Figure 3.6b). Although large rises in this item were typical of most months of the year, they were particularly notable in the second half. Due to the method in which this item is measured, increases in it reflect increases in apartment rental fees.31 During the second half, the rate of increase in that item exceeded the rate of increase in apartment prices. Part of the increase in rental prices can be attributed to the weakening of the shekel against the dollar in the fourth quarter of the year (Figure 3.5), which affected rental prices via exchange rate indexation mechanisms, albeit to a

[30] Regarding the combination of a flexible exchange rate and price rigidity as a fundamental explaining the increase in the variability of the real exchange rate in small open economies that had switched to a flexible exchange rate regime, see: T. Monacelli (2004). "Into The Mussa Puzzle: Monetary Policy Regimes and the Real Exchange Rate in a Small Open Economy", Journal of International Economics, 62, 191-217.

[31] For a discussion of the method of measuring this item since 1999, see: Zallman Shifer (2001), "The Owner-Occupied Housing Item in the Consumer Price Index," Bank of Israel Survey 73, pp. 45-63 (in Hebrew).

far lesser extent than in the past.32 Even when exchange rate indexation mechanisms operate, however, the pass-through from the rate of depreciation (in the relevant period) to renewed rental contracts (which comprise most of the housing item) is not completely understood. Since a correlation is observed in the data between the dollar exchange rate (in the relevant period) and the owner-occupied housing item, this may reflect the persistency of dollar-denominated pricing when renewing a contract, due to the "option" offered by dollar denomination or for other reasons. Apart from the potential effect of a depreciation of the shekel against the dollar in the relevant period, the increase in rental prices may express a shift in demand during the second half from apartment purchase to rented accommodation. Such a shift in demand could derive from three background factors: (1) A decrease in the public's wealth perception due to the decline in asset prices and the adverse effect on the feeling of occupational security; (2) the rise in the interest rate in certain mortgage offers and an increased demand for equity capital as a result of the increased assessment of households' risk; (3) a "natural" response to the decline in yield on investment in an apartment during the first half, because apartment prices rose more than rental prices.

The food item (excluding fruit and vegetables), which has a 14 percent weighting in the CPI, rose by 9.1 percent during the year and contributed 1.3 percentage points to the rise in the general index. An upturn in this item began at the end of 2007 as a result of the large and continued increase in world prices for agricultural commodities. Table 3.6 and Figure 3.6 illustrate the large rises in this item until May, and the subsequent more moderate increase which was followed by a gradual decrease. In the past, a low pass-through was observed in the food industry between input prices (agricultural commodities) and finished goods prices. This pass-through recently appears to have increased. If this is the case, one possible explanation is that in the past, prices of agricultural produce were highly volatile and lacked a clear trend, with the result that frequent changes in the costs of inputs are not translated into changes in price to the end consumer. From the beginning of 2005 until 2008 however, a clearly discernible trend in the prices of agricultural produce was apparent, and this was reflected in food prices as well.

The apartment maintenance item, which has a 10 percent weighting in the CPI, rose by 3.9 percent during the year and contributed 0.4 percentage points to the increase in the general index. This item, which is comprised of electricity, diesel and water for private consumption, was affected by increases in the prices of its constituent goods and services, most of which are under government supervision. The increase in the price of energy services and products resulted from the development of raw material prices in the world market.

[32] Box 3.2 in the Bank of Israel Report for 2007 describes the decline in the rate of exchange-rate indexation in the housing market. According to Central Bureau of Statistics data, the proportion of contracts indexed to the exchange rate at the end of 2008 amounted to 18 percent of total renewed contracts and 33 percent of all contracts in the stock.

The transportation item,[33] which has a 17 percent weighting in the CPI, fell by 3.8 percent during the year and held down the general index by 0.6 percentage points. However, the annual change in this item did not reflect its high volatility during the year (Table 3.6 and Figure 3.6), in line with the development of oil prices as described extensively above: the transportation item rose at a higher rate than the inflation target in the first half, and fell steeply in the second half.

4. THE MONETARY AND CREDIT AGGREGATES

In an inflation targeting regime, where the nominal anchor is the target and the policy instrument for attaining it is the interest rate, the money supply in the economy is determined in accordance with the public's demand. Therefore a situation of disequilibrium in the money market, which affects the market for products and labor, could not arise. Nevertheless the Bank of Israel, like inflation-targeting central banks in other economies, continues to monitor the development of the monetary aggregates and the development of the narrow monetary base in particular. This is because a meaningful and unexplained growth in the money supply could be indicative of a need for a reassessment of policy.

The growth rates in the monetary aggregates during 2008 and 2007 were higher than in previous years. This was partly due to the high rate of inflation and the low rates of interest in 2007–08.

The development of the monetary and credit aggregates during 2008 appears to have conformed to real and financial developments, which are reviewed extensively in the other chapters of this report and provide a reasonable explanation for it. Table 3.7 shows that the growth rates in the monetary aggregates during 2008 were similar to those in 2007, and that both of them expanded more rapidly than in previous years. The monetary base grew by 16 percent, cash and shekel current account deposits (M1) increased by 17 percent, and together with unindexed deposits for a term of up to a year (M2), these expanded by 13 percent. These high growth rates in the past two years match the high rates of inflation in those two years and the relatively low real interest rate (Table 3.1). An examination of each individual quarter (Table 3.7) shows that even in the last quarter of 2008, despite the downturn in actual inflation and the rise in the real interest rate (Figure 3.2), the monetary base and the monetary aggregates expanded at higher rates than in the first three quarters. In contrast to the serious liquidity crisis in the USA and Europe, the aggregates reveal that the commercial banks and the financial system in Israel functioned properly in 2008: In the USA and Europe, the ratio between the monetary aggregates and the monetary base fell considerably as the result of an aggressive expansion of the monetary base (a policy reaction that applied the lessons learned from the Depression of the 1930s) and the complete cessation of inter-bank trading in liquidity (the market's reaction to the crisis). However, Table 3.7 shows that in Israel the rate of growth in the monetary aggregates remained the same as that in the monetary base in the fourth quarter as well. Accordingly, the ratio

[33] Part of the transportation and communications item, which has an overall weighting of 21 percent in the CPI.

The proper functioning of Israel's money market, unlike those of money markets around the world, was an expression of the resilience of the banking system in Israel, which is due to regulation, the conduct of the banks, and the monetary policy.

between M1 and the monetary base remained stable at a level of 1.5 as in previous years, and unlike in the USA where it fell heavily from a ratio of 14 during recent years to a ratio of less than 2 in November 2008.[34] The decline in the ratio in the USA reflects the liquidity crunch there: Despite the Fed's massive injections, the banks preferred to place deposits with the Fed rather than extend loans in the market. These developments highlight the resilience displayed by the Israeli banking system to date, which derived from the factors reviewed in Chapter 4, The Financial System. This resilience of the banking system is a result of comprehensive regulation and tight supervision, particularly since the Israeli banking system crisis of 2002.[35] In the USA, some put the blame on expansionary monetary policy which lasted too long, from 2002 to 2005, as one of the background factors behind the inflated prices of real and financial assets, which in turn harmed the banking system there.[36] Such claims are irrelevant in the Israeli case. Due to this resilience, the global crisis does not currently appear to be threatening the stability of the Israeli banking system and this is apparent from the proper functioning of inter-bank liquidity trading.

Unlike the price of credit, the amount of inter-bank credit, as reflected in the monetary and credit aggregates, developed in a manner different from the dramatic worldwide developments. Bank credit in 2008 expanded at a rate slightly higher than that in previous years: Total bank credit to the public (C3) rose by 5 percent (Table 3.7). The developments in banking-system credit are to be viewed as part of the developments in the entire credit market; developments that included a sharp decline in the balance of credit and a decline in the growth rate since the outbreak of the subprime crisis in summer 2007 (Table 3.7, see detailed review in chapter 4 about the financial system).[37] Since the onset of the subprime crisis in summer 2007, the paucity of sources of nonbank credit led to a substantial growth in the market segment of bank credit. However, the banking system did not supply all of the resulting shortfall and the growth rate of aggregate credit in the economy decreased. As stated, the downturn fully conformed to the other developments reviewed in this report. The downturn derived from expectations of a further slowdown in activity and deterioration in firms' and households' solvency, expectations that are reducing the amount of credit requested as well as the amount offered. In the last quarter of the year, interest margins in the

During the year activity in the nonbank credit market shrank. This led to a faster increase in bank credit, but not fast enough to make up the shortfall, so that the growth of total credit in the economy slowed.

[34] Data on the USA are taken from Monetary Trends, Federal Reserve Bank of St. Louis, February 2009. A high ratio of 14 prior to the crisis derived from the large holdings of the American currency outside of the USA due to the dollar's worldwide status. The large decrease in the ratio to a level of less than 2 resulted from a dramatic increase in the monetary base concurrent with an only moderate expansion in M1.

[35] See Bank of Israel, Israel's Banking System, Annual Survey, 2002.

[36] See J. Taylor (2009). The Financial Crisis and the Policy Responses: An Empirical Analysis of what Went Wrong, NBER Working Paper 14631.

[37] It should be noted that bank and nonbank credit is denominated in revaluated terms, and not in its value from the debtors' point of view: the credit from nonbank sources is denominated in market value, and bank credit is net of loan loss provision and allowance for doubtful debts. In 2008, the decline in the growth rate of credit—as shown in Table 3.7—is to a very large extent attributed to the sharp decline in the market value of tradable bonds and the revaluation in the banking system.

unindexed local currency segment expanded slightly (Table 3.2). It is not clear as to what extent this expansion resulted from the increase in risk premium, and to what extent it resulted from growth in the banks' market power resulting from the drying-up of nonbank sources of credit. It is also difficult to assess the effect of the business cycle and of other factors on the supply of credit and the demand for it. In any event, the very fact that the margins expanded suggests that the reduced supply of credit, as distinct from the reduced demand for it, is dominant in its effect. Additional indication

Table 3.7
Rates of Change in the Monetary Aggregates and Credit, 2003-08
(end of period, monthly averages, percent change in period, year on year)

	CPI-indexed credit to public	Unindexed NIS credit C1	Credit Bank indexed to foreign currency		Total Bank credit	Nonbank credit to the business sector	Total credit to the private sector	Monetary aggregates		Monetary base
			In $ terms	In NIS terms				M1[a]	M2[b]	
2003	-5.6	3.1	1.6	-4.9	-3.0	7.0	-1.6	7.7	2.0	6.3
2004	-4.1	8.4	6.7	5.5	2.6	24.9	3.8	17.9	5.6	8.3
2005	2.0	11.0	-7.4	-1.6	3.7	31.4	8.6	23.8	5.3	14.7
2006	-4.3	14.2	7.2	-2.3	2.2	23.2	6.3	8.3	7.2	4.0
2007	2.8	15.2	6.8	-0.7	6.0	25.9	10.4	17.4	14.3	13.6
2008	0.6	17.1	4.2	3.3	5.4	-8.6	2.1	17.0	13.0	16.0
2005										
I	-4.6	10.3	3.8	-0.3	1.2	22.4	2.4	15.0	5.3	6.8
II	-3.6	9.4	0.7	-0.0	1.5	29.6	5.4	16.6	7.8	8.6
III	-0.7	10.8	-3.1	-2.2	2.4	32.7	7.3	14.9	5.1	9.6
IV	2.0	11.0	-7.4	-1.6	3.7	31.4	8.6	23.8	5.3	14.7
2006										
I	2.3	9.9	-0.6	7.6	6.8	35.3	11.1	19.3	4.7	14.9
II	1.3	12.7	3.7	3.4	5.8	22.7	8.0	15.1	2.8	9.3
III	-0.5	12.7	4.9	0.6	4.0	17.3	5.5	11.5	6.2	7.2
IV	-4.3	14.2	7.2	-2.3	2.2	23.2	6.3	8.3	7.2	4.0
2007										
I	-3.4	18.7	2.9	-7.8	1.2	19.2	5.3	11.3	13.1	6.4
II	-3.0	16.6	3.2	-3.5	2.4	29.5	9.0	15.7	16.2	10.6
III	0.4	13.8	5.7	-0.7	3.9	28.3	9.6	20.6	16.9	12.3
IV	2.8	15.2	6.8	-0.7	6.0	25.9	10.4	17.4	14.3	13.6
2008										
I	4.0	13.8	9.4	-8.6	3.8	17.6	8.1	12.7	11.4	9.7
II	4.1	17.5	8.9	-12.4	4.2	8.3	5.7	11.7	8.7	10.3
III	1.7	20.4	4.1	-9.7	5.2	1.6	5.5	11.8	7.9	12.5
IV	0.6	17.1	4.2	3.3	5.4	-8.6	2.1	17.0	13.0	16.0

[a] M1: cash and demand deposits.
[b] M2: M1 plus unindexed NIS plus deposits up to one year.
SOURCE: Bank of Israel and Central Bureau of Statistics data.

of this is the tightening of the financing restriction in all the principal industries during the last quarter.[38]

The lower rate of increase in credit during the year could be partly attributed to the particularly large expansion in previous years, and the previously mentioned developments simply eroded part of the surplus credit. The same applies to the margin between the interest rate on overdrafts and the monetary interest rate: Part of the increase could be attributed to the previous low margins.

Apart from the rate of increase in aggregate bank credit, the bank credit data in Table 3.7 detail the rate of increase in its components as well. The data show stability in the growth rate of unindexed local currency credit (C1), which expanded by 15 percent annually in the last three years. Although the growth rates in CPI-indexed credit declined during recent years, their quarterly development since the end of 2007 is indicative of a larger rate of increase until the third quarter and a subsequent smaller increase, similar to the development of actual inflation and inflation expectations, and could have been affected by them. Foreign-currency indexed credit contracted in each of the first three quarters (in shekel terms) despite the overall increase in bank credit, and against the background of the appreciation of the shekel in that period. This might be explained, at least in part, by the continued appreciation that possibly led to concern over a large depreciation that would "correct" it as the result, for example, of interest rate cuts or foreign-currency purchases by the Bank of Israel. Data for the last quarter support this explanation. These data show that foreign-currency indexed credit expanded (in both dollar and shekel terms) concurrent with the depreciation of the shekel.

5. SOURCES OF CHANGE IN THE MONETARY BASE AND THE OPERATIONAL TOOLS OF MONETARY POLICY

The principal objective of monetary policy is to attain the inflation target subject to supporting growth, employment and financial stability. Since mid-1997 and until March 2008, when the Bank of Israel began to purchase foreign currency, the sole policy instrument was the determination of the interest rate at which the central bank lends to the banking corporations or borrows from them. The Bank of Israel interest rate thereby influences the market interest rates, which in turn affect inflation by means of non-financial and financial activity as well as the monetary base in the economy. The monetary operational tools the Bank of Israel uses to adjust the amount of liquidity required to attain the policy rate are banking corporations' loans/deposits as well as market based tools, *makam* and repo. This activity is intended to offset changes in the amount of liquidity resulting from government injections/absorptions in the course of the management of fiscal policy, and from foreign currency conversions deriving from conversions by the government or purchases by the Bank of Israel.

[38] As apparent from the Bank of Israel's *Companies Survey* for the fourth quarter.

For the first time in ten years, in 2008 the Bank of Israel began to operate again in the foreign-currency market, in order to increase the country's foreign exchange reserves. Although these purchases injected liquidity into the market, this was absorbed by means of the monetary auctions and via the issue of makam. Table 3.8 shows that in 2008 the monetary injection resulting from the Bank of Israel's foreign currency purchases (NIS 44 billion) exceeded the absorption created by the government's activity (NIS 17 billion) by NIS 27 billion. However, the monetary base expanded by only NIS 8.3 billion. The surplus, the injection deriving from the foreign-currency purchases net of the government absorption and the growth in the monetary base, was re-absorbed by the Bank of Israel which as a result and as shown in Tables 3.9 and 3.10, moved in the second half from injecting liquidity (by means of monetary loans) to absorbing liquidity from the banks (by means of deposits).

The Bank of Israel's purchases of foreign currency were reflected in a gradual increase in the banks' deposits with the Bank and in a gradual decrease in the monetary auctions.

Table 3.8
Sources of Change in the Monetary Base, 2003-08 (NIS million)

	2003	2004	2005	2006	2007	2008	2008 I	2008 II	2008 III	2008 IV
1. Monetary injection, government and the Jewish Agency	3,479	1,600	-1,452	-3,791	-10,809	-17,371	-9,491	-8,549	-10,860	11,529
of which: Government	1,968	244	-2,679	-5,235	-11,977	-18,470	-9,819	-8,773	-11,059	11,182
2. Foreign currency conversions[a]	-1,358	-1,751	-1,087	-1,141	-870	-961	-285	-178	-187	-311
of which: On the trading floor	0	0	0	0	0	43,995	2,416	4,282	18,338	18,958
3.Total (1+2)	2,121	-151	-2,539	-4,932	-11,679	25,594	-7,389	-4,447	7,191	30,239
4. Monetary injection by Bank of Israel	1,446	1,117	9,896	3,797	15,694	-17,299	7,665	5,657	-4,162	-26,459
of which: Monetary loan	-237	152	-756	7,470	-7,500	0	5,000	5,486	-5,576	-4,910
Makam	-9,386	-17,986	-10,508	-7,362	23,736	10,820	2,354	168	1,368	6,928
Swaps	379	-53	6,216	0	0	0	0	0	0	0
Banks' term deposits	4,243	14,257	12,440	3,560	-300	-28,011	300	0	0	-28,311
Interest[b]	2,774	1,104	432	134	20	14	4	-2	-4	15
5. Total change in monetary base	**3,567**	**966**	**7,357**	**-1,135**	**4,015**	**8,295**	**276**	**1,210**	**3,029**	**3,780**

[a] This item includes, inter alia, Bank of Israel and government receipts from and payments to the private sector, such as income tax payments. These payments do not change the monetary base, and appear in the item Government Injection, and with the opposite sign in this item.

[b] Excluding *makam*.

SOURCE: Bank of Israel.

During 2008, mainly in the second half, the injection deriving from the foreign-currency purchases led to a gradual increase in the volume of deposits in the Bank of Israel and to a gradual decrease in the volume of the monetary loans (Tables 3.9 and 3.10). December was a month of deposits only. In addition, the Bank of Israel increased the pace of makam issues, which also contributed to the growth in absorption.

Table 3.9
Monetary Instruments:[a] Time Deposits, Monetary Loans, and *Makam*, December 2007–December 2008

(monthly averages, NIS million)

	Deposits			Loans			*Makam*		
	Total time deposits	Daily	Weekly	Total	Daily	Weekly	Total	*of which* held by banks	Total deposits, loans and *makam*
2007									
December	500	500	0	-2,003	-2,003	0	75,666	8,038	74,163
2008									
January	2,081	2,081	0	-4,480	-3,351	-1,129	73,869	7,864	71,470
February	0	0	0	-5,445	-4,479	-966	74,984	6,853	69,539
March	495	495	0	-3,611	-3,611	0	74,389	6,398	71,273
April	0	0	0	-4,617	-4,617	0	74,359	4,799	69,742
May	292	292	0	-7,664	-5,922	-1,742	73,940	5,153	66,568
June	0	0	0	-12,249	-7,549	-4,700	74,677	5,622	62,428
July	81	81	0	-5,663	-3,598	-2,065	74,146	5,021	68,564
August	0	0	0	-6,384	-5,255	-1,129	75,920	5,750	69,536
September	0	0	0	-3,931	-3,931	0	76,391	5,488	72,460
October	1,030	1,030	0	-1,099	-1,099	0	75,977	5,541	75,908
November	1,143	1,143	0	-1,633	-1,633	0	78,850	4,550	78,360
December	5,880	5,880	0	0	0	0	78,928	4,984	84,808

[a] Other monetary instruments, not shown in this table, include the credit window, the deposits window and repo.
SOURCE: Bank of Israel.

Interesting to note is that these developments contrast with developments in the USA and Europe, where interest-rate hikes in the money market were indicative of a liquidity problem due to the cessation of inter-bank trading in liquidity. This problem motivated central banks to increase loan auctions and to cancel deposit tenders while supplying the entire amount requested.[39] The worldwide policy response to the liquidity crunch in this manner represented an application of the lessons learned from the Depression of the 1930s. As stated, the money market in Israel did not suffer from a crisis such as this.

In 2008 the Bank of Israel reverted to the issue of *makam* for a term of three months. These issues began in August and were increased following September's events. Motivating this measure was the large demand for investment in the money market funds that were launched at the beginning of the year. These funds invest in short-term, high-rated assets, and came on the market due to structural reforms and financial developments. The funds generated high demand for short-term assets as

[39] See for example: "Liquidity Conditions and Monetary Policy Operations in the Period from 13 August to 11 November 2008", Box 3 in the ECB Monthly Bulletin, December 2008.

part of the trend of shortening durations, and the preference for liquid and safe assets. This subject is discussed more extensively in Box 4.2 in Chapter 4.

Table 3.10
Monetary Deposits, Monetary Loans, and their Costs, 2006–08

(total system, quarterly averages)

	Utilization of deposit auctions			Cost of deposit auctions		Utilization of loan auctions			Cost of loan auctions	
	Daily	Weekly	Total	Daily	Weekly	Daily	Weekly	Total	Daily	Weekly
	NIS million			percent		NIS million			percent	
2006										
I	3,500	376	3,876	4.78	4.60	2,310	452	2,761	4.82	4.88
II	3,559	452	4,011	5.30	5.39	839	0	839	5.41	---
III	1,949	0	1,949	5.56	---	2,036	0	2,036	5.61	---
IV	731	0	731	5.52	---	5,990	1,355	7,345	5.35	5.19
2007										
I	0	0	0	---	---	8,575	5,226	13,801	4.37	4.38
II	0	0	0	---	---	9,365	7,257	16,621	3.82	3.83
III	1,914	0	1,914	3.69	---	3,470	0	3,470	3.88	---
IV	630	0	1,914	4.08	---	2,165	0	2,165	4.10	---
2008										
I	859	0	859	4.12	---	3,814	698	4,512	4.11	4.35
II	97	0	97	3.30	---	5,943	2,147	8,091	3.43	3.53
III	27	0	27	3.82	---	4,261	1,065	5,326	4.11	3.95
IV	2,690	0	2,690	3.10	---	1,366	0	911	3.51	---

SOURCE: Bank of Israel.

At the end of the year, the composition of absorption instruments was changed again, as the Bank of Israel announced that it was employing several measures to increase the liquidity in the financial system.[40] These measures included fewer issues of one-year *makam*, in favor of an increased proportion of daily monetary deposits, and a decrease in the margin on discount-window loans for the commercial banks from one percent to half a percent. Concurrently, the Bank of Israel announced that it was extending the term of the sources which it supplies, whether by means of monetary loans or via repo tenders. In this way it is trying to encourage the financial institutions to extend long-term loans to the private sector, and thereby alleviate the difficulties in raising credit.

In May 2008, the inclusion of the shekel in the settlement arrangements in the CLS (Continuous Linked Settlement) Bank completed yet another important phase in the reform of Israel's payment systems; a phase that supports safe and final NIS-FX conversions. Entry into the CLS system could not have taken place without the

[40] See the Bank of Israel announcement of 24.12.2008.

successful introduction of the RTGS (Real-time Gross Settlement) system (in July 2007)—a system for immediate and final payments in shekel. It seems that the establishment of the advanced payment systems before the deterioration in the global crisis in September 2008 contributed to the relative resilience of Israel's financial system, to investors' and traders' confidence in the payment and settlement systems in Israel, to the elimination of infection and to the moderation of the severity impact of the global crisis on the local financial system.