

Chapter 3

Prices

The Consumer Price Index (CPI) rose by only 1.3 percent in 1999, significantly below the inflation target (4 percent) and similar to inflation rates in developed countries. The development of prices during the year shows that the inflation environment in Israel is still higher than in those countries, however. The first quarter should be regarded as an adjustment of the sharp depreciation and the Bank of Israel's response to it at the end of 1998, with NIS appreciation and a 1.4 percent decline in the CPI. Developments in the other three quarters constitute a better indication of the inflation environment as there were no major exogenous shocks then although it was feared that they might recur, primarily in the second and third quarters. Uncertainty was reflected by expectations that there would be NIS depreciation towards the end of the year as well as by considerable fluctuations in inflation expectations, which fell to within the inflation target range only in the last two months of 1999. In the last three quarters of the year the CPI rose by an annual rate of 3.7 percent, slightly below the annual inflation target. Note that the moderate change in prices came in the wake of tight monetary policy and in the context of restrained economic activity. The principal achievement of monetary policy in 1999 was to restore the path of moderate price increases which had characterized the economy in 1998 before the global financial shocks, expressed *inter alia* in the depreciation and steep price increases of the end of 1998.

The main challenge facing monetary policy in the next few years is to consolidate this achievement by attaining the inflation target for the years 2000 and 2001 of 3–4 percent, while gradually reducing the interest rate. Despite the slow rise of the CPI in 1999, the background conditions in 2000 appear to embody the danger of accelerated inflation, headed by the trend of narrowing the interest-rate spread vis-à-vis abroad, a rapid rise in the monetary aggregates, the recovery of domestic demand, and the expected increase in world merchandise prices.

1. MAIN DEVELOPMENTS

General

The CPI rose by 1.3 percent in 1999, but the inflation environment had not yet been consolidated at the level customary in the industrialized countries.

During 1999 the Consumer Price Index (CPI) rose by 1.3 percent, compared with 8.6 percent in 1998, constituting the lowest rate of increase in the last three decades. While this rate is significantly below the inflation target for 1999 (4 percent), and attests to a marked reduction in the inflation environment, an analysis of price developments over the year indicates that the inflation environment in Israel has not yet been consolidated at the level accepted in the industrialized countries—2 percent. In the first quarter the CPI fell by 1.4 percent, compared with a rise of 2.8 percent in the remaining three quarters (3.7 percent in annual terms). However, as regards the development of the price indices the first quarter should be regarded as the continuation of the events of the last quarter of 1998, when the global financial shock was reflected *inter alia* in depreciation, a sharp rise in prices, and the Bank of Israel's response to it. In the other three quarters the economy returned to the moderate inflation environment that had characterized it in the year prior to the last quarter of 1998, but there were still apprehensions that the foreign-currency market would be hit by shocks.¹ In the last two months of the year, when these fears were proved to be unfounded, inflation expectations² declined drastically, alongside NIS appreciation and particularly low rates of change in the CPI (–0.2 percent in November and 0.0 percent in December). The development of the main price indices during 1999 was similar to that of the CPI (Table 3.1 and Figure 3.1).

In view of events at the end of 1998, the main challenge confronting monetary policy at the beginning of 1999 was to ensure that the depreciation and sharp price increases of the last quarter of 1998 were not translated into an inflationary process. When it became clear that this objective had indeed been achieved monetary policy focused on consolidating the inflation environment in the region of the target for 1999 (4 percent) and for the years 2000 and 2001 (3–4 percent).

In the second half of 1999 the Bank of Israel left its key interest rate unchanged until the end of November. Only when inflation expectations declined did the Bank reduce the interest rate again.

To keep inflation from accelerating, the Bank of Israel raised the interest rate sharply in November 1998 (by a cumulative 4 percentage points), and only once inflation expectations had fallen radically (in the context of the negative rate of change in the CPI at the beginning of 1999) was the trend of reducing the interest rate reinstated (the trend had been interrupted at the end of 1998 because of the steep price increases). On the other hand, in the second half of 1999—in view of the relatively high level of inflation expectations, increased uncertainty regarding fiscal policy, the rise in world

¹These apprehensions were expressed in exceptional assumptions of depreciation for the last quarter of 1999 by all the forecasting agencies.

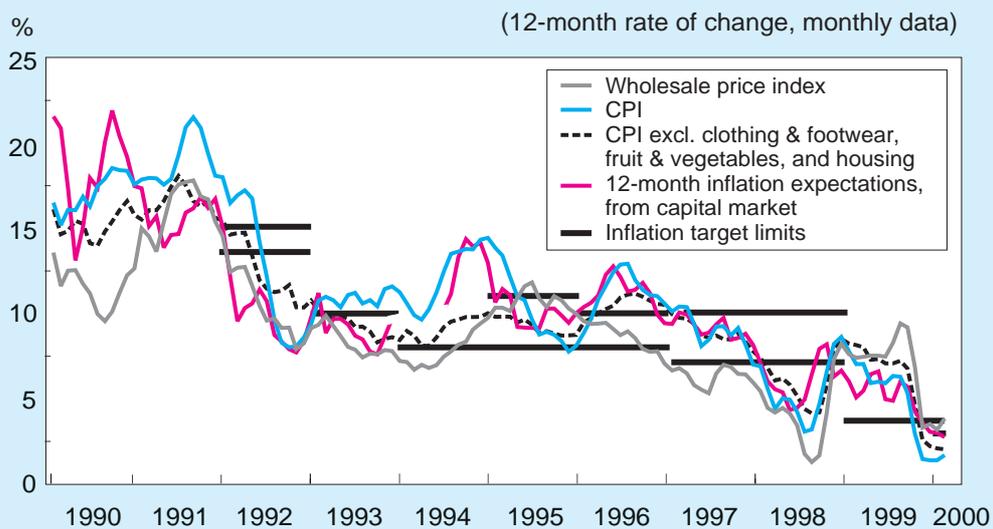
²Inflation expectations are calculated on the basis of the yield differential between indexed and unindexed bonds redeemed at the same time. This calculation incorporates a risk premium for uncertainty regarding future inflation. For the method of calculating these expectations, see Bank of Israel, *Inflation Report for July–December 1999*, Appendix 1.

Table 3.1
Prices and Exchange Rates, 1997–99

Index	Annual rate of change			3-4% inflation environment	Shock on foreign-currency market	Return to moderate inflation environment
	1997	1998	1999	July '97–July '98	Aug '98–Mar '99	Apr–Dec '99
(annual rates of change, percent)						
Index						
CPI	7.0	8.6	1.3	3.7	7.4	3.7
CPI excl. vegetables and housing	6.7	8.5	1.7	4.3	8.7	2.8
Adjusted CPI ^a	7.8	8.5	2.2	5.1	9.9	2.4
Wholesale prices	5.9	8.2	3.3	2.5	10.9	5.7
Housing prices	7.5	8.8	-0.9	2.9	2.7	5.5
Tradables	5.8	8.7	-0.1	3.4	9.0	1.4
Nontradables	7.7	8.6	2.3	3.9	6.3	5.5
Tradables excl. clothing & footwear	7.7	9.0	0.5	4.7	11.9	0.2
Nontradables excl. fruit & vegetables and housing	7.9	8.1	3.9	5.4	8.0	4.7
Exchange rates						
Dollar	7.9	18.2	-0.4	5.5	15.6	5.4
Currency basket	3.7	20.6	-2.5	3.7	16.8	4.2

^a CPI adjusted for fruit and vegetables, clothing and footwear, and housing.
 SOURCE: Central Bureau of Statistics and Bank of Israel data.

Figure 3.1
Main Price Indices and the Inflation Target, 1990–February 2000



SOURCE: Central Bureau of Statistics and Bank of Israel.

oil prices, fears of Y2K-associated problems, and expectations of depreciation—the Bank of Israel’s key interest rate was left unchanged until the end of November. Only after it had become apparent that the inflation environment had declined, as indicated by the steep fall in inflation expectations to the region of the target for the years 2000 and 2001 alongside calm in the foreign-currency market, did the Bank of Israel continue to reduce the interest rate.

Several major macroeconomic factors operated in 1999 to restrain the rate at which prices rose: monetary restraint persisted, the real effective *ex ante* interest rate on the Bank of Israel’s sources averaged 7.5 percent (compared with 6.2 percent in 1998, 5.2 percent in 1997, and lower rates in previous years), and the nominal interest rate was set while monitoring inflation expectations, so that the decline of the latter enabled interest to be reduced at a moderate pace in the course of the year.

Economic activity remained moderate during 1999 in spite of the turnaround that emerged in the second quarter, and this supported the low rate of price increases. The gap between actual and potential GDP continued to widen, and the unemployment rate reached 8.9 percent.

There was local-currency appreciation in the first quarter of 1999 (a continuation of the trend that had emerged in mid-November 1998), following the interest-rate hike at the end of 1998, and this was accompanied by a decline in the CPI. In April through October 1999 there was depreciation, and the CPI rose at an annual rate of 5.2 percent. In the last two months of the year the trend of appreciation was apparent once more while prices remained stable, so that at the end of the year the exchange rate of the NIS against the dollar was only 0.4 percent above that of December 1998 (monthly averages). Hence, the annual change in the exchange rate was among the factors that supported the moderate price increases during the year.

In the first three quarters of 1999 inflation expectations ranged between 5 and 7 percent, fluctuating widely within this range. Only in the last two months of the year did expectations plummet, to an average level of 3 percent in December, in line with the lower limit of the inflation target for the year 2000. This decline in expectations towards the end of the year appears to have derived from the dissipation of fears of accelerated depreciation in the fourth quarter, and when there was NIS appreciation they fell to within the inflation target range. Because of the adaptive nature of expectations, however, their decline may have been due in part to the low inflation rate of the preceding twelve months.

Fiscal policy tended to be restrictive in 1999, continuing the tight policy of the last few years. In 1999 the overall budget deficit was lower by 0.2 percent of GDP than in 1998, and stood at 2.2 percent. While this deficit is 0.2 percent of GDP above the target, the context of the moderate economic activity should be borne in mind. Similarly, the rise in domestic public consumption prices, reflecting the government expenditure side, beyond the increase in the CPI, which reflects the government income side, supported the fiscal restraint embodied in the deficit: while the CPI went up by an average of 5.2 percent, domestic public consumption prices increased by 5.6 percent.

At the end of 1999 the exchange rate was only 0.4 percent higher than it had been in December 1998.

Inflation expectations ranged between 5 and 7 percent in 1999, declining only at the end of the year to reach an average level of 3 percent in December.

By contrast, the development of wages in 1999 supported a steeper increase in prices than an inflation environment of 3–4 percent. In the business sector the average nominal wage per employee post rose by 8.8 percent. Adjusting for productivity, which declined by 1.9 percent, wages express an average nominal increase of about 11 percent that was not reflected in the CPI in 1999. In the public sector wages rose by 4.9 percent on average, and this also supports a relatively high rate of price increases. If the development of wages in the year 2000 does not involve an adjustment accompanied by increased productivity wages will tend to exert upward pressure on prices in the future.

The development of wages in 1999 did not support the moderate rate of price increases.

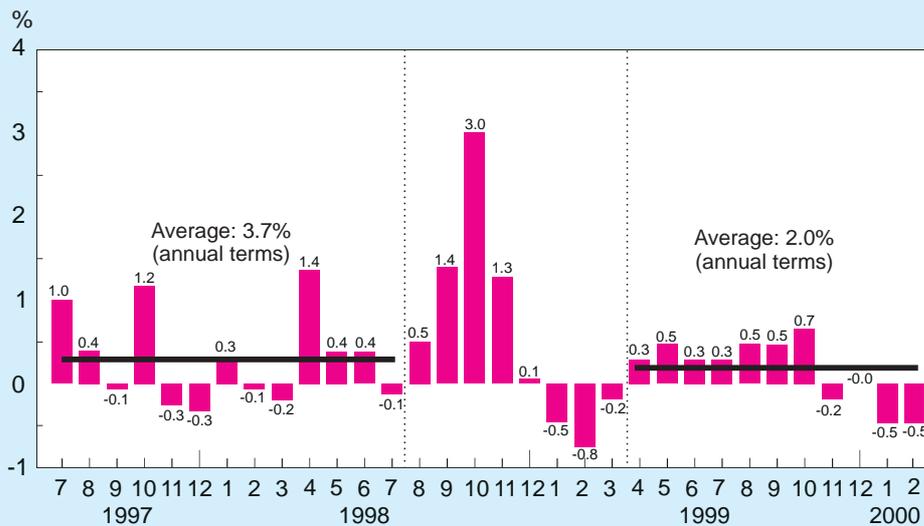
The inflation environment

As stated, the development of prices in 1999 was not uniform throughout the year because of the shock on the foreign-currency market. Taking a broader view that goes beyond the calendar year, the sharp depreciation at the end of 1998 and the appreciation that came in its wake can be seen as a shock that temporarily deflected the development of price indices from the low inflation environment that had begun to emerge from July 1997 (Figure 3.2). Before the depreciation (at the end of July 1998) the rate of price increases in the preceding twelve months had been only 3 percent. Nonetheless, the inflation environment that has been developing since the second quarter of 1999 seems more stable than that of the period before September 1998.

The inflation environment which has begun to emerge since 1997 was temporarily upset by events in the foreign-currency market.

Several factors contributed to the decline in the inflation environment at the end of 1997 as well as to its preservation subsequently. In contrast to the preceding years, during 1997 most of the factors affecting prices operated to moderate their rate of

Figure 3.2
Monthly Rate of Change of CPI, July 1997–February 2000



SOURCE: Central Bureau of Statistics and Bank of Israel.

Starting in 1997, most of the variables affecting prices acted to moderate their rate of increase.

The exchange rate was allowed in effect to float and this led to the weakening of the pass-through from it to prices.

Since 1997 there has been a shift in fiscal policy that has contributed to the lowering of the inflation environment.

increase. In that year both monetary and fiscal policy acted to restrain demand, as was expressed in domestic demand and economic activity; the unemployment rate was 7.7 percent—up from 1996, after declining steadily since 1992; for most of 1997 the exchange rate remained very near the lower limit of its band, and the rate at which import prices rose moderated substantially relative to previous years. After 1997 several factors supported the consolidation of the inflation environment: the adherence to the declining budget deficit path starting in 1997 (when a significant adjustment, which has been maintained since then, was made); the continuation of the inflation target regime and preservation of the downward path of the targets; and the exchange rate that in effect was allowed to float, weakening the link between it and the development of prices. All these variables affected inflation expectations, which continued the downward trend evident since mid-1996.³

In the middle of June 1997 the exchange-rate band was widened considerably, and the slope of the lower limit was lowered to 4 percent (later it was lowered to 2 percent). The widening of the exchange-rate band reduced support for future depreciation derived from its slope, and at the same time the Bank of Israel ceased its intervention in the foreign-currency market. As a result of these developments the exchange rate was in effect allowed to float, leading to the weakening of the pass-through from the exchange rate to prices.

In the fourth quarter of 1997 inflation expectations stood at an average level of 8.5 percent, in line with the inflation target for 1998 (7–10 percent). Thereafter, until July 1998, expectations plummeted, reaching an average of 4.9 percent. Following the shocks on world financial markets there was steep NIS depreciation, and expectations soared to an average of 8.2 percent in October 1998. Only after the Bank of Israel stepped in by raising the interest-rate steeply did expectations decline towards the inflation target.

Since 1997 a clear shift in fiscal policy has been evident, helping to bring the inflation environment down and maintain it at that level. The alteration was expressed in the continuing decline in the fiscal impulse, embodying the change in the general government domestic deficit adjusting for the effect of the business cycle. In general, without a substantial change in fiscal policy at a time of waning economic activity the public-sector deficit can be expected to rise because of the fall in tax revenues, while during a surge in economic activity the deficit can be expected to decline. Maintaining a declining fiscal impulse path (i.e., adhering to tight fiscal policy) is a pivotal element in reducing the inflation environment, as is evinced by its decline in both 1992 and 1997.⁴ In 1997 the fiscal impulse declined by 2.4 percent of GDP, and the downward

³For more detailed information about the macroeconomic variables that led to the reduction of inflation in 1997, see Bank of Israel, *Annual Report 1997*, Chapter 3.

⁴For a discussion of the fiscal impulse and its contribution to reducing the inflation environment, see M. Dahan and M. Strawczynski (1999), 'Fiscal Policy and Shifts in the Inflation Environment,' in L. Leiderman (ed.) *Inflation and Disinflation in Israel*, Jerusalem, Bank of Israel, Research Department (Hebrew). For 1997, too, the results of an up-to-date calculation of the fiscal impulse and the change in the public debt relative to potential GDP are consistent with an ongoing fiscal shift (in accordance with the criteria presented in the article), supporting the reduction of the inflation environment.

path was maintained in 1998 and 1999, when it dipped by 1.0 and 0.4 percent of GDP respectively. Note that the declining path of the fiscal impulse was recorded at a time of moderating economic activity, so that fiscal restraint contributed to the decline in the inflation environment.

Another factor facilitating both the reduction of the inflation environment in 1997 and its continuation today is the rise in the credibility attributed by the public to monetary policy, and its assessment that the Bank of Israel is resolute in its determination to reduce inflation both by means of the inflation target regime, which increases the transparency of the Bank's aims, and by means of interest-rate policy and adherence to the strategy of non-intervention in the foreign-currency market. An expression of the greater credibility is indicated by the fact that after the exchange-rate band was widened in June 1997 there was virtually no need to intervene in the foreign-currency market to defend it, even though for quite a large part of the year after the band was widened the exchange rate remained very near its lower limit. Another indication was the transition to holding unindexed assets, even though part of this should be ascribed to the rise in the interest rate.

The credibility of monetary policy has supported the reduction of the inflation environment since 1997.

Box 3.1: Developments on the Foreign-Currency Market at the end of 1998, and Monetary Policy

The sequence of events

- August 6, 1998: the government set an inflation target for 1999 of 4 percent. At the same time, the slope of the lower limit of the exchange-rate band was reduced from 4 percent to 2 percent and the interest-rate was reduced by 1.5 percentage points. The next day the NIS depreciated by 1.8 percent against the dollar, and on the following trading day inflation expectations rose from 4.3 percent to 6.1 percent.
- August 17, 1998: the Russian central bank announced a change in the parameters of its exchange-rate band because of difficulties in maintaining the stability of the rouble. The central bank refused to meet its commitments to repay its domestic debt during a crisis, and deferred the repayment of its external debts by 90 days. During the following week the NIS depreciated by 1.1 percent against the dollar, and inflation expectations rose from 5.2 percent to 6.0 percent.
- August 24, 1998: the Bank of Israel left the interest rate for September unchanged. During the subsequent week the NIS depreciated by 2.0 percent against the dollar, and inflation expectations rose from 6.0 percent to 7.2 percent.
- September 1, 1998: the Russian central bank announced that it had ceased to intervene in foreign-currency trading because it could not maintain the value of the rouble. There was no significant response in Israeli markets.

- September 23, 1998: the Bank of Israel left the interest rate (for October) unchanged. There was no significant response in Israeli markets.
- September 27, 1998: the US Federal Reserve was obliged to rescue the LTCM hedge fund. About ten days later, on October 6 (between these two dates there were only two trading days, September 28 and October 1, because of the Day of Atonement, the weekend, and Tabernacles), the NIS depreciated sharply against the dollar, alongside a steep rise in inflation expectations. Within three days the NIS depreciated by 9.7 percent, and inflation expectations reached 14.3 percent.
- October 26, 1998: the Bank of Israel raised the interest rate by 2 percentage points, to 11.5 percent; the instability persisted.
- November 12, 1998: the Bank of Israel raised the interest rate by 2 percentage points, to 13.5 percent. The NIS began to appreciate, as inflation expectations plummeted.

As this review of events shows, on the basis of the *post hoc* analysis it can be seen that the shock to the foreign-currency market was the combined outcome of exogenous developments and monetary policy. In view of the large number of events in such a short period, it is difficult to distinguish the extent to which each one contributed to the course of developments, but they both operated in the same direction, and it is not inconceivable that they reinforced one another. Thus, for example, the narrowing of the interest-rate spread at the beginning of August 1998 was not in itself sufficient to cause a shock to the foreign-currency market, as is indicated by the moderating of the shocks towards mid-August. The crisis in Russia and the absence of a monetary policy response served to undermine the stability of the markets.

Throughout the period the Bank of Israel refrained from intervening in foreign-currency trading, both for fear of a speculative assault on the NIS and in order to maintain the credibility of its monetary policy. The crisis peaked after 27 September, 1998, when the Federal Reserve bailed out the LTCM hedge fund. As stated, only in November, after a cumulative 4 percentage-point hike in the interest rate, did stability return to the markets.

Lessons to be learned

Long-term target: the inflation target for 1998 was 7–10 percent. The rate of change of the CPI in 1998 was 8.6 percent, while the rate of change in the twelve months prior to the depreciation was only 3.0 percent. Thus, had it not been for the events described above the Bank of Israel would not have attained the inflation target for the year, and at the same time without dealing appropriately with

developments in the foreign-currency market it might not have been possible to attain the 1999 inflation target of 4 percent. Hence, it is necessary to make the inflation target more flexible, i.e., to set a long-term target independent of fixed dates. The Bank of Israel's response to the events of the end of 1998 might have been more moderate and more timely if a long-term target had been in place, as it would have been possible to absorb a non-recurring price shock without deviating from the target.

Width of exchange-rate band: on July 18, 1997 the upper limit of the exchange-rate band was raised by 15 percent, widening it significantly. When the decision to expand the band was made the exchange rate was near its lower limit, after a long period in which the Bank of Israel had intervened in foreign-currency trading in order to defend the lower limit. Raising the upper limit at that time was a preventive step that has proved itself: it may be assumed that if the band had not been widened in time the Bank of Israel would have had to intervene in foreign-currency trading in order to defend the upper limit as it depends on the Bank's foreign-currency reserves—which are not unlimited—so that the interest-rate hike that would have been necessary if the upper limit had not been raised would have been greater than it actually was (4 percentage points). The conclusion to be drawn from all this is that structural changes should be made in markets when the situation permits this, and that it is not advisable to wait until they are needed.

Interest-rate path: depending on the circumstances, sharp interest-rate changes can have a destabilizing effect, *inter alia* impairing the attainment of the inflation target. Consequently, a gradual approach is required in the process of reducing the interest rate, especially in the context of the narrowing of the interest-rate differential between Israel and abroad. A moderate decline in the interest rate will make it possible to examine the reaction of the market without deterring it too sharply from substituting foreign currency for NIS. By leading to changes in the composition of the public's asset portfolio, a moderate reduction of the interest rate could indicate the value of the risk premium for holding NIS rather than foreign currency, thereby helping the central bank to determine the interest rate in the future.

The pass-through from the exchange rate to inflation expectations: as a result of the shocks in the foreign-currency market, the pass-through mechanism from depreciation to inflation expectations appears to have changed, reflecting the public's learning process: in the 1990s, until August 1998, changes in the exchange rate were not correlated with inflation expectations, but since the shock to the foreign-currency market the correlation between them has increased significantly.

2. FACTORS AFFECTING THE DEVELOPMENT OF PRICES

Policy factors*Monetary policy*

In the last few years there has been a growing tendency among monetary policymakers, in the world in general and in Israel in particular, to regard price stability as their main aim. In several countries this tendency was also accompanied by legislative changes, redefining the aims of central banks while increasing their independence. In striving to attain price stability there is an increasing tendency to deploy monetary policy in the framework of a regime of inflation targets or other monetary targets that serve as indicators of inflation, such as the money supply (M1). Target regimes of this kind already exist in many countries (Canada, Australia, the UK, New Zealand, Chile, Mexico, the EU, etc.), and in Israel it has been in effect since 1992. Setting an inflation target in combination with controlling the nominal interest rate helps to stabilize the public's inflation expectations around the target, and hence facilitate its attainment.

The inflation target set for 1999 was 4 percent, significantly below the targets of the preceding two years, 7–10 percent. Although this target is also lower than the actual inflation rate in those years it was consistent with the development path of prices from July 1997 to August 1998, when the CPI rose by an annual rate of only 3.7 percent. The inflation targets of 3–4 percent for the years 2000 and 2001 express another step towards consolidating the low rate of inflation. For the first time since the inflation target regime was introduced a two-year target has been set, increasing the transparency of the central bank's aims. The target set for these years is still determined in terms of a calendar year, however, and for each of the two years involved it is 3–4 percent. Changing this approach

in the future, i.e., setting targets with a longer horizon, will afford greater flexibility in deploying monetary policy, making it easier for the Bank of Israel to respond to exceptional events that might temporarily deflect the rate of annual price increases from the target. It is important that the government determines an inflation target towards the middle of each year, so that the long-term horizon is preserved. Note, too, that for the first time the government set the inflation target together with the deficit target, as an expression of the comprehensive economic strategy that will be adopted in the next few years.

The principal policy instrument available to the Bank of Israel is the nominal interest rate on the deposits of commercial banks at the monetary auction. In 1999 monetary policy continued to operate to attain the inflation target by determining a nominal interest

The inflation target for 1999 was 4 percent. Setting future targets for a longer horizon will afford greater flexibility in deploying monetary policy.

Table 3.2
The Inflation Target and Actual Inflation, 1992–2001

	(rate of change during year, percent)	
	Inflation target	Actual rise in CPI
1992	14–15	9.4
1993	10	11.2
1994	8	14.5
1995	8–11	8.1
1996	8–10	10.6
1997	7–10	7.0
1998	7–10	8.6
1999	4	1.3
2000	3–4	–
2001	3–4	–

SOURCE: Based on Central Bureau of Statistics data.

rate while taking the development of inflation expectations into account. Thus, for example, in the first quarter the real effective *ex ante* interest rate (i.e., adjusted for inflation expectations) averaged 8.3 percent (a nominal interest rate of 14.3 percent while expectations were 5.5 percent). Only when it became clear that the sharp depreciation at the end of 1998 was not being translated into a protracted inflationary process did the central bank embark on a series of interest-rate reductions of 0.5 percentage points a month in March, April, and May, until the rate reached 12 percent. When inflation expectations remained at a level that was 2–3 percentage points above the inflation target the trend of reducing the interest rate stopped until the end of November (except for a single 0.5 percentage-point reduction in July). The Bank reduced the interest rate again only at the end of November 1999, after inflation expectations had fallen to the target range for the year 2000 (3–4 percent), so that in December the Bank of Israel's key interest rate was 11.2 percent.

A long-term perspective generally reviews inflation by examining the money supply in relation to the development of GDP, as in the final event an inflationary process will develop if the growth rate of the money supply outstrips that of GDP (more units of money than units produced). The money supply usually develops in step with the Bank of Israel's interest rate: when the nominal interest rate rises the growth of the money supply is checked, and vice versa. Furthermore, the money supply is the monetary aggregate whose development is generally most consistent (with a lag) with the annual rate of price increases. Thus, for example, some of the price acceleration of 1994 can be attributed to the expansion of the money supply in 1993, the decline in prices in 1995 was due to the slower growth of the money supply in 1994, and the acceleration of prices in the first three quarters of 1996 stemmed from the acceleration of the money supply in 1995. Since 1997 the rate of expansion of the money supply adjusted for the growth rate of GDP has remained relatively stable at about 10 percent, while the rate of price increases has fallen steeply, to below 10 percent (Figure 3.3).

Moreover, since the beginning of 1990 the M2 aggregate has risen relatively rapidly (at an annual average rate of 20 percent). This aggregate consists of M1 *plus* short-term deposits which, if translated into M1 upon maturity, will serve to intensify the inflationary pressure described above. While the expansion of monetary aggregates could, as stated, exert upward pressure on prices, some of it can be ascribed to the reduction in the inflation environment, i.e., the fall in the velocity of circulation, so that not all of the increase in the monetary aggregates exerts pressure on prices.

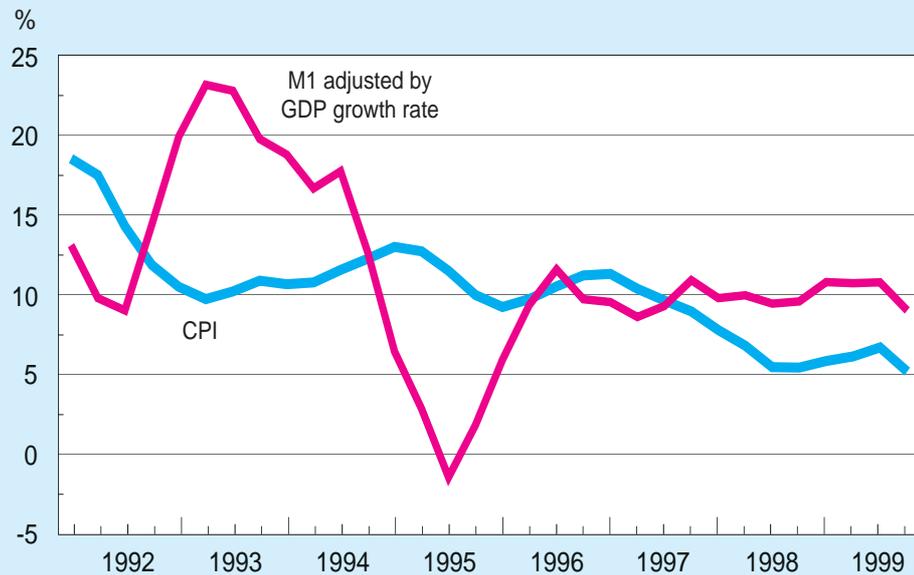
Apart from monitoring the development of the money supply, monetary policy also takes into account the yield spread vis-à-vis abroad,⁵ especially the fact that a sharp

The nominal interest rate is determined while taking the development of inflation expectations into account.

Since 1997 the rate at which M1 adjusted for the rate of GDP growth has expanded has stayed at a relatively steady 10 percent.

⁵ In general, the nominal interest rate in Israel is equal at equilibrium to the interest rate abroad *plus* expected depreciation and the risk premium for holding local rather than foreign currency. The risk premium declines as the inflation environment in Israel approaches that abroad.

Figure 3.3
CPI and M1 Adjusted by GDP Growth Rate, 1992–99



SOURCE: Central Bureau of Statistics and Bank of Israel.

It will be possible to narrow the interest-rate spread vis-à-vis abroad only when the inflation environment has been consolidated at the level accepted in the developed countries.

interest-rate reduction that is not in line with the inflation target will bring accelerated depreciation in its wake because of the shift from local to foreign currency. It can also lead to a rise in both prices and inflation expectations, making it possible to narrow the yield spread without creating inflationary pressures only when the inflation environment—and inflation expectations, in particular—is consolidated at a level in line with that customary in developed countries.

Fiscal policy

Fiscal policy affects both the development of prices in the short run and the inflation rate around which the economy will stabilize in the long run. In the long run the size of the debt, the budget deficit, and the extent to which the surplus income of the Bank of Israel is used to finance them will help to determine the rate of inflation, while in the short run the rate of price increases is affected by the size of public expenditure, which is a major component (some 30 percent) of total demand. The size of the budget and the extent of the deviation from it play a role in molding inflation expectations, and hence also indirectly affect the development of prices. This explains *inter alia* the need to maintain a declining budget deficit path in order to reduce the long-term rate of inflation.

The overall budget deficit declined from 2.4 percent of GDP in 1998 to 2.2 percent of GDP in 1999. Notwithstanding, the government departed from the annual target, which was 2.0 percent of GDP; this was in contrast with the two preceding years,

Table 3.3
Indicators of the Inflation Environment, 1993–99

Index	(percent, average annual rates of change)												
	Long-term average											1999	
	1993	1994	1995	1996	1993–96	Standard deviation	1997	1998	1999	I	II	III	IV
CPI	10.9	12.3	10.0	11.3	11.2	0.9	9.0	5.4	5.2	-0.6	0.3	1.1	1.0
Adjusted CPI ^a	9.2	9.2	9.2	10.5	9.5	0.7	8.9	6.0	6.3	1.4	0.1	0.9	0.6
CPI excl. fruit & vegetables and housing	9.0	8.7	9.3	10.2	9.3	0.6	8.3	5.5	6.0	1.0	0.4	0.3	1.0
CPI excl. clothing and footwear	11.2	12.9	10.2	11.6	11.5	1.1	9.5	5.8	5.5	-0.3	0.1	1.7	0.7
Wholesale prices	8.2	7.9	10.7	8.6	8.8	1.3	6.3	4.2	7.0	0.5	1.2	0.8	1.9
Tradable prices	7.3	7.9	8.2	9.1	8.1	0.8	7.1	4.5	5.7	0.6	0.4	-1.1	0.8
Nontradable prices	12.8	15.1	11.2	12.6	12.9	1.6	10.2	5.9	4.9	-1.4	0.3	2.6	1.1
Housing	19.3	23.6	14.3	15.9	18.3	4.1	10.8	5.7	2.7	-4.7	-0.2	4.9	0.3
Controlled and supervised prices	11.2	10.5	9.5	11.5	10.7	0.9	9.2	5.4	3.9	0.4	-0.9	1.0	2.4
Domestic uses ^b	10.8	12.5	10.0	9.4	10.7	1.3	7.7	5.7	5.2	-0.1	1.8	0.9	-0.2
GDP deflator	11.5	13.3	9.8	11.4	11.5	1.4	8.8	6.7	6.4	2.0	2.2	-0.1	0.5
Business-sector product	10.3	9.0	7.0	10.0	9.1	1.5	8.9	6.9	7.6	3.7	0.6	-0.5	1.3
Private consumption	10.7	11.6	4.0	10.2	9.1	3.5	7.9	5.3	6.0	0.4	1.3	0.9	-0.2
Public consumption	11.2	20.4	24.1	12.0	16.9	6.3	8.1	6.4	5.7	0.8	5.9	-1.6	-0.2

^a CPI adjusted for fruit and vegetables, clothing and footwear, and housing.

^b Excluding direct defense imports.

SOURCE: Central Bureau of Statistics and Bank of Israel.

The recovery of economic activity will facilitate attainment of the deficit targets.

when it met the target, albeit with the aid of the Bank of Israel's 'real realized profit.'⁶ Moreover, in 1999 the government increased the deficit target for the year 2000 by 0.75 percent to 2.5 percent of GDP, even though it also resolved that it should gradually be reduced to 1.5 percent of GDP by 2003 at the latest. The economic recovery, which will enlarge government revenues, appears to create the appropriate backdrop for keeping the 2000 deficit at a level that does not exceed that of 1999, and therefore for converging more rapidly towards the original deficit target course.

Determining a declining deficit target path serves to signal future fiscal contraction that is consistent with attaining the inflation target. If these targets are attained and are not altered they will enhance the credibility of fiscal policy and *inter alia* support the consolidation of the inflation environment at the level customary in the industrialized countries.

Public consumption excluding direct defense imports rose by 3.4 percent in 1999, more than the 1.5 percent increase in 1998 and the 2.2 percent rate of GDP growth. Thus, public expenditure, in contrast with the overall deficit, supported a faster rate of price increases than actually occurred. However, part of this expansion was offset by the increase in the price of domestic public consumption (an average of 5.6 percent)—expressing prices on the expenditure side—which exceeded the rise in the CPI (an average of 5.2 percent) signifying prices on the income side.

The nominal wage in the public sector rose by an average of 4.9 percent in 1999, compared with 5.8 percent in 1998 and far higher rates in earlier years. Although the ongoing decline in the rate of wage increases serves to support the disinflation process, the rate of increase in 1999 was still above the inflation target.

The development of inflation expectations

Inflation expectations constitute a major indicator for the Bank of Israel in determining the interest rate on commercial banks' deposits. The expectations are calculated on the basis of capital-market data, and as they are backed up by financial behavior they reflect the public's assessments of the future rate of increase of prices, and therein lies their significance.⁷ Inflation expectations affect the rate of actual price increases by influencing the behavior of players in the market via the rate at which wages rise (determined in wage agreements), the extent to which the various indexation arrangements are adhered to, and the investment considerations of foreign investors, as well as having a direct effect on prices themselves.

The decline in inflation expectations in 1997 and until mid-1998 made the continuous reduction of the interest rate possible (Figure 3.4). The declining trend of the interest rate was checked in August 1998 due to the rise in inflation expectations. Only at the end of October 1998, because of the steep depreciation and rise in inflation expectations

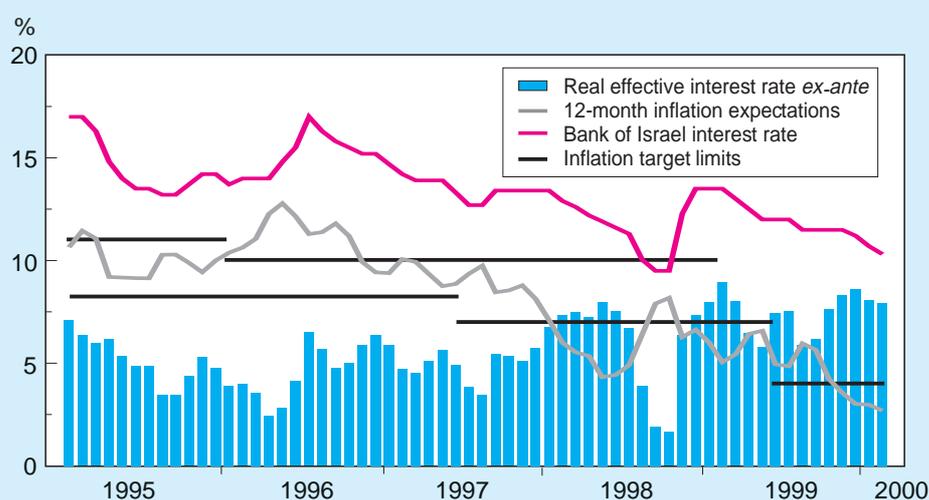
⁶ For a discussion of the Bank of Israel's profits, see Chapter 5.

⁷ The behavior of inflation expectations resembles that of estimates of price rises by various forecasters which are based on econometric equations and price sampling.

to over 8.0 percent, far above the inflation target for 1999, was the interest rate raised sharply by 4 percentage points. Subsequently inflation expectations began to fall towards the target, and this together with the negative price indices of the first quarter of 1999 enabled the interest rate to be lowered. Nonetheless, inflation expectations remained higher than the target—despite the low rate of price increases at the beginning of 1999—ranging between 5 and 7 percent for most of the year. As a result, the trend of interest-rate reductions was stopped and was renewed only after expectations declined to within the target range for the year 2000 (3–4 percent).

During 1999 inflation expectations remained above the target level; consequently, the trend of interest-rate reductions was checked, and was renewed only once expectations fell to the target level.

Figure 3.4
Inflation Expectations and Targets, Bank of Israel Interest Rate, and Real Effective Derived Interest Rate,^a 1995–February 2000



^a Annual rates of change.

SOURCE: Central Bureau of Statistics and Bank of Israel.

The use of the interest rate as the principal instrument of monetary policy has proved its ability to steer inflation expectations and actual inflation towards the targets, whether operating directly or indirectly by means of the exchange rate. Note in this connection that the link between inflation expectations and the exchange rate has tightened considerably since the depreciation at the end of 1998. An examination of monthly data throughout the 1990s shows that until July 1998, immediately prior to the depreciation, expectations were not correlated with the monthly rate of depreciation (a correlation of -0.06), whereas from August 1998 to February 2000 there was a clear-cut shift in the way expectations were generated, as is indicated by the jump in the correlation to 0.68 .

The link between inflation expectations and the exchange rate has strengthened considerably since the depreciation at the end of 1998.

The pass-through from the exchange rate to prices

The exchange rate affects the CPI through several channels:

- As a small open economy, Israel regards the prices of goods abroad as given; this means that players on the domestic market cannot alter the value of these goods in foreign currency even though they trade in some of them. The shift in the local-currency price of these goods, which is derived mainly from the change in their foreign-currency price and the exchange rate, enters the CPI.
- The prices of goods produced in Israel and not traded abroad, but the raw materials for which are imported, will also be influenced by exchange-rate changes via the price of the raw materials.
- The prices of many goods and services in Israel are denominated in dollars, and hence a change in the exchange rate immediately leads to a shift in their local-currency price. The effect of market forces in these cases, i.e., a change in their dollar price, is usually expressed only after a while.

Each of these channels causes changes in the exchange rate to be reflected in the CPI. The extent and timing of the effect can alter over time, whether as a result of shifts in the composition of the goods which are traded abroad and produced using imported intermediates or are indexed to the dollar, or as a result of changes in the level of economic activity in Israel. During a slump depreciation will not necessarily lead to a full rise in the local-currency prices of imported goods, as it is difficult to sell goods then anyway.⁸ The extent to which depreciation affects the level of prices may also change in accordance with the extent of permanency the public attributes to it. Thus, for example, for most of the 1980s, when the exchange rate was managed or fixed, any change in it was translated fully and immediately into a price rise, as it was clear that the new exchange rate expressed a permanent change; on the other hand, since the transition to the various forms of exchange-rate band and to the current regime, which enables the rate to move within a very wide band, not every exchange-rate shift is translated into a change in prices, as it is evident that depreciation on a given trading day could become appreciation the next day. Consequently, the considerable volatility of the current exchange-rate regime has weakened the intensity of the pass-through.

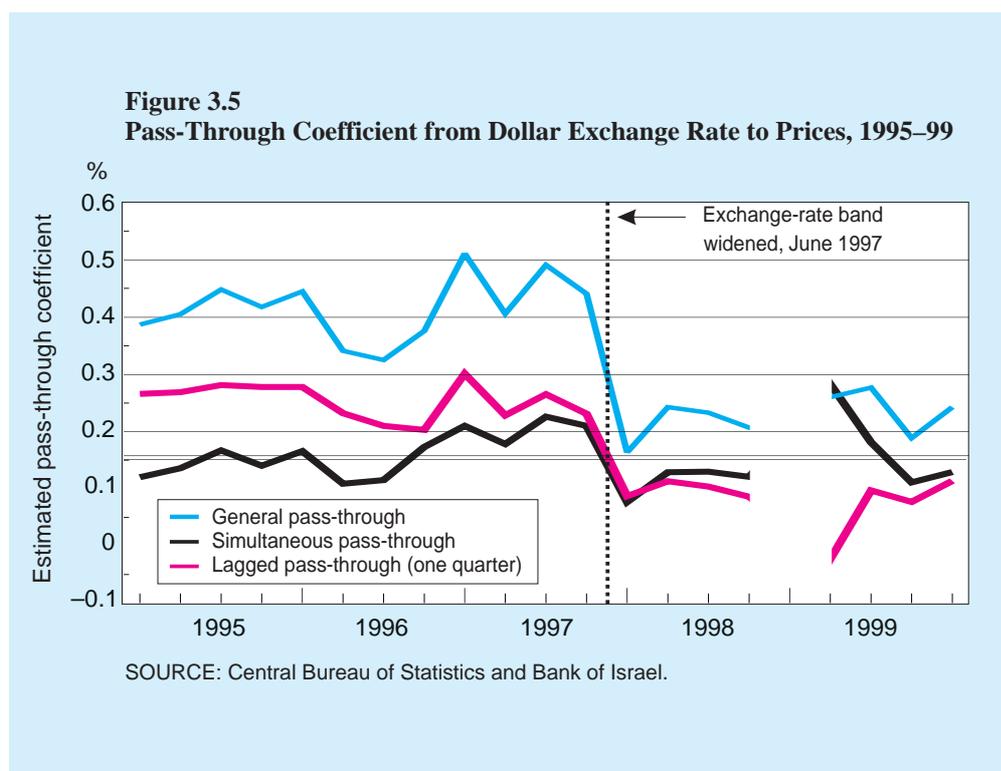
The claim that the structural change in the foreign-currency market has moderated the pass-through coefficient by altering the behavior of players in the market is reinforced by the empirical evidence: an estimation of the price equation on a rolling regression of five years during the 1990s shows that the pass-through coefficient fell from 0.4 before the exchange-rate band was widened

Due to the floating nature of the exchange rate, shifts in it have not been translated into a change in prices.

The pass-through coefficient estimator fell from 0.4 in 1997, before the exchange-rate band was widened, to only 0.25 subsequently.

⁸ For a discussion of the pass-through coefficient in general, and the effect on it of the level of economic activity in particular, see H. Bar-Or and L. Leiderman (2000), *Monetary Policy Rules and Transmission Mechanisms Under Inflation Targeting in Israel*, Discussion Paper no. 2000.01, Research Department, Bank of Israel (February).

to only 0.25 after it (Figure 3.5). This change appears to stem not only from the technical rise in the volatility of the exchange rate but also from the credibility of monetary policy which refrained from intervention in trading other than to defend the limits of the exchange-rate band. Nonetheless, because of the growing trends towards open markets and online trading more and more products are becoming tradable, probably causing the pass-through coefficient to rise in the future.



Various estimations show that in the sharp depreciation in the fourth quarter of 1998 and the subsequent appreciation at the beginning of 1999 most of the pass-through was immediate and that the effect of past exchange-rate changes was negligible. At that time the shekel depreciated by a cumulative 4.8 percent against the dollar⁹ (8.6 percent depreciation in 1998:IV and 3.5 percent appreciation in 1999:I), and the CPI rose by 2.9 percent (4.4 percent in 1998:IV and –1.4 percent in 1999:I). While these rates of change are not precisely in line with the pass-through coefficient estimator, it is evident

In the depreciation of 1998, and the subsequent appreciation at the beginning of 1999, most of the pass-through appears to have been immediate.

⁹ March 1999 average vis-à-vis September 1998 average.

that even though the CPI is influenced to a great extent by the exchange rate, the pass-through mechanism is neither full nor immediate, as it was in the years of high inflation. Nevertheless, because of the sharp exchange-rate changes at that time, the transition from the exchange rate to prices was quicker than it was in the 1990s, and in effect the pass-through persisted for only one quarter. The rapid transition from the exchange rate to prices can be explained by the fact that much of the sharp change in the former was perceived as permanent, and even if it was not its intensity was such that producers were unable to absorb the increase in production costs, so that these were immediately transferred to consumers.

In the last three quarters of 1999 the NIS depreciated by another 4.0 percent against the dollar and the CPI rose by 2.8 percent. Over the year as a whole the NIS depreciated by only 0.4 percent against the dollar, and by 2.5 percent against the currency basket—rates that supported the low rates of change of the CPI in 1999.

GDP and uses

Excess demand was met by increasing civilian imports, alleviating upward pressure on prices.

The annual rate of expansion of uses serves as an indication of the development of demand for GDP. Over 1999 as a whole, GDP rose by an average of 2.2 percent, compared with a 6.1 percent increase in total uses excluding direct defense imports. This excess demand was met by the expansion of civilian imports, which rose by an average of 14.7 percent in 1999, thereby alleviating the pressure on domestic prices.

An examination of developments in the course of 1999 shows that the revival of demand led GDP. In the first quarter of 1999 GDP was down by 2.1 percent¹⁰ from the last quarter of 1998, continuing the moderate level of economic activity that prevailed in Israel in 1997 and 1998. In that quarter uses expanded by 1.3 percent; the second quarter presaged emergence from the recession, with GDP increasing by an average of 2.5 percent in this and the next quarter, compared with a 3.3 percent rise in uses. In the fourth quarter GDP grew by 1.2 percent and uses by 3.3 percent.

Because of the moderate level of economic activity, the supply side responded to increased demand by increasing production rather than raising prices.

The more rapid rise in uses than in GDP is not yet sufficient to create pressure for the renewal of the inflationary process; this is because in view of the wide gap between actual and potential output in 1999 it is reasonable to assume that the supply side will respond to the increase in demand by expanding production rather than raising prices (for a discussion of potential output, see Chapter 2). Furthermore, the high unemployment rate during the year helped to moderate the change in prices: an estimation of the short-term link between inflation and unemployment shows that the high unemployment rate (averaging 8.9 percent) contributed 1.3 percentage points to the reduction of the CPI in 1999.

¹⁰ Rates of change in this section are based on quarterly data, which are usually updated with a lag, so that the final figures may reveal a different picture.

Table 3.4
Determinants of Prices, 1990–99
 (average annual rates of change, percent)

	Average 1990-93	1999											
		1994	1995	1996	1997	1998	1999	I	II	III	IV		
Change in import and export prices^a													
Imported intermediates ^b	7.3	9.0	14.0	2.2	2.2	4.9	2.3	-3.3	-3.0	-0.5	2.1		
Civilian imports ^b	11.2	8.3	10.0	3.8	3.8	4.7	7.3	-5.0	1.1	3.3	-0.4		
Exports ^b	11.2	5.6	6.7	7.0	6.2	6.7	8.3	-2.7	0.4	3.6	1.8		
Fuel	5.7	4.1	10.9	20.8	0.3	-21.9	32.2	-7.0	24.2	28.7	15.1		
Change in foreign trade prices^c													
Private consumption imports	1.4	0.5	7.6	-4.1	-4.4	-3.5	-1.0	-2.6	-2.2	0.2	0.0		
Civilian imports ^b	1.0	1.8	10.0	-2.0	-4.1	-5.0	-1.8	-2.1	0.2	0.9	-1.4		
Real change in product and uses													
GDP	5.5	7.0	6.8	4.6	2.9	2.2	2.2	-2.1	2.8	2.3	1.2		
Total uses	8.2	8.1	7.1	5.6	2.5	2.0	6.1	1.3	3.1	3.5	2.0		
Rise in total uses beyond GDP	2.7	1.1	0.3	1.0	-0.4	-0.2	3.9	3.4	0.3	1.2	0.8		
Labor costs													
Wage per employee post	14.1	15.2	12.4	13.1	11.6	7.7	7.6	2.1	3.7	0.9	2.1		
Public sector	15.5	23.6	16.1	13.4	8.9	5.8	4.9	4.0	8.3	-0.6	-0.6		
Business sector	13.4	11.8	10.7	12.9	12.8	8.5	8.8	2.9	1.7	1.4	3.4		
Real unit labor cost, business sector	11.9	10.9	7.3	13.5	11.5	7.1	9.9						
Fiscal changes													
Total public-sector deficit ^d	4.8	3.5	4.8	5.5	4.1	3.6	4.8						
Public-sector domestic deficit ^d	7.5	4.6	5.9	6.6	5.4	5.0	5.5						
Monetary changes													
Money supply (M1)	25.3	20.6	8.4	14.9	14.3	12.1	11.4	-1.2	2.7	6.6	2.2		
Inflation expectations ^{e,f}	13.2	13.3	10.0	11.2	9.2	6.1	5.3	5.7	6.1	5.4	4.0		
Real interest on 10-year bonds ^f	2.6	3.2	4.3	4.5	4.0	4.8	5.1	5.2	5.1	5.2	5.3		
Unemployment rate	10.4	7.8	6.8	6.6	7.5	8.6	8.9	8.4	8.6	9.7	8.8		
Exchange rates													
Currency basket ^g	11.3	7.8	4.6	3.5	4.3	9.6	8.3	-4.5	-1.0	2.4	1.5		
Dollar	10.3	6.4	0.0	5.9	8.2	10.2	8.9	-3.3	0.7	2.2	1.1		

^a Foreign trade prices multiplied by the exchange rate.

^b Excluding diamonds and capital services.

^c Dollar prices.

^d Percent of GDP.

^e 12-month horizon, derived from the capital market, and assuming full tax-exemption for the investor.

^f The data refer to levels, not rates of change.

^g According to composition of new basket in 1999, data before then are based on the new method of calculation through backward chaining.

SOURCE: Based on Central Bureau of Statistics data.

Cost variables

Wages

The development of wages affects prices through two main channels:

- Since the wage is the price of labor input, a rise in it limits the profitability of production and therefore reduces the supply of products, causing their price to rise. This channel is relevant for the business sector because most activity in the public sector is not productive and hence is not for purposes of profit.
- A rise in wages will increase the demand for products as a result of the income effect, and will hence exert upward pressure on prices. This channel might generate inflationary pressures if wages rise faster than economic activity.

Unit labor cost serves as an indicator of wage cost pressures on prices in the business sector. A rise in this variable expresses a greater increase in the cost of labor (in terms of producer prices) than in labor productivity, so that this expresses upward pressure on prices as a result of the erosion of the profitability of production (the first channel). In the business sector unit labor cost rose by an average of 9.9 percent in 1999, more than it had in 1998 (7.1 percent) but less than in 1996 and 1997 (11.5 and 13.5 percent respectively). These data indicate that in 1999 there was supply-side pressure from wages on prices for a greater increase than actually occurred.

The average wage per employee post rose by an average of 7.6 percent in 1999, thereby exerting demand-side pressure on prices (the second channel). The average wage rose by 8.8 percent in the business sector and by 4.9 percent in the public sector, while in 1998 it rose by 8.5 and 5.8 percent respectively. Thus, the development of wages in 1999 does not appear to have fostered the disinflationary process, primarily in the business sector. Similarly, on the basis of the wage agreements signed in November 1999, and so far implemented only in part, it seems that in the year 2000 the inflationary pressures from wages will persist, at least in the public sector.

The development of wages in 1999 did not help the disinflationary process.

Other costs

Local-currency prices of imported intermediates (excluding fuel and diamonds) rose by an average of only 2.4 percent in 1999—compared with 4.9 percent in 1998—due primarily to the depreciation of the NIS in the fourth quarter. The rise in 1999 is also lower than those of 1996 and 1997, when the price of intermediates increased by 2.2 percent. Note that the prices of fuel, lubricants, etc. rose by over 30 percent on average in 1999 in view of the rise in prices on world markets, but since they account for only 10 percent of the index of intermediates their influence on it is relatively small (the general index of intermediates prices rose by an average of 4.9 percent in 1999).

The interest rate on total bank credit declined by 2.4 percentage points in 1999, to stand at an average level of 15.5 percent in the fourth quarter. Real *ex ante* interest displayed a declining trend in the first three quarters, but in the wake of the steep drop in inflation expectations towards the end of the year, it rose by 1.5 percent over the year as a whole, to 11.8 percent.

Local-currency prices of imported intermediates rose on average by only 2.4 percent.

3. THE DEVELOPMENT OF PRICES

Tradables and nontradables

In a small open economy such as Israel's the rate at which domestic prices rise is affected by changes in prices of tradables (imports, exports, and their domestic substitutes), and these are determined mainly by supply and demand conditions in world markets as well as by the development of the exchange rate. The effect of the prices of these products increases with an economy's openness,¹¹ but their rate of change is not identical with that of domestic prices because some products are not traded in world markets (principally various services and housing) and their prices are influenced mainly by supply and demand on the domestic market, even though many of them are denominated in dollars. Thus, for example, while the price of housing is denominated in dollars and rose during the sharp depreciation in the fourth quarter of 1998, it increased by less than the depreciation, so that its dollar-denominated price declined. In general, a change in the ratio of tradables to nontradables prices in the CPI serves as an indication of a real change in the exchange rate: a sharper rise in the price of tradables than in that of nontradables signifies real depreciation.¹²

In the first quarter of 1999 prices of tradables fell by 1.2 percent, while there was nominal appreciation of 3.5 percent. Prices of nontradables declined by 1.7 percent, so that the real depreciation that had begun in the fourth quarter of 1998 persisted. Later in the year there was a trend shift and prices of tradables rose by 1.0 percent while those of nontradables went up by 4.1 percent, indicating the revival of real appreciation. Over the year as a whole tradables prices dipped by 0.2 percent and nontradables prices rose by 2.3 percent, so that the annual trend was real appreciation of 2.4 percent.

Another indication of real exchange-rate shift is provided by comparing prices of imports and/or exports in national accounts data with those of GDP; if the rise in the former exceeds that in the latter there is real depreciation. The picture that emerges from this indicator differs from that obtained by comparing tradables and nontradables prices. Until (and including) the fourth quarter of 1998 both indicators developed along similar lines, signalling ongoing real appreciation. In the first quarter of 1999 the picture changes, and national accounts prices reveal real appreciation also in the the first half of 1999, followed by a steeper rise in import and export prices than in the GDP deflator, i.e., real depreciation. The difference in the development of the two indicators of the real exchange rate attests to the need for additional observations in order to discern its trend after the sharp depreciation of 1998.

The real depreciation that had begun at the end of 1998 persisted in the first quarter of 1999, but the trend shifted later in the year.

¹¹ Tradables prices account for about 40 percent of the CPI.

¹² This criterion of real depreciation has been criticized on the grounds that the tradables/nontradables classification does not withstand the test of reality as it was updated most recently only at the beginning of the 1990s. In addition, this classification refers solely to the components of the CPI.

CPI components

The main contributors to the rise in the CPI were food, allied housing expenses, and education, culture, and entertainment.

The development of the ten main groups of consumer goods shows that the main contribution to the rise in the CPI came from food as well as from the education etc. item, and that each of these groups contributed 0.4 percentage points to the rise in the CPI. The allied housing expenses item contributed 0.3 percentage points, and together these three components account for over 37 percent of the CPI. Also noteworthy were the fruit and vegetables item, whose rise exceeded that of all the components (6.5 percent), and the clothing and footwear item, which fluctuated widely, even more so than it has done in the last few years. The greatest decline was in this item, which fell by 4.0 percent. Housing, which has the largest share in the CPI (over 20 percent) fell by 0.9 percent.

Figure 3.6
CPI by Ten Major Groups,^a 1992–99



^a Year-on-year rate of change.
SOURCE: Central Bureau of Statistics and Bank of Israel.