PART IV

MONETARY DEVELOPMENTS

12

Bringing Inflation Under Control

LUCA ANTONIO RICCI

A mounting body of theoretical and empirical evidence has built up in recent years suggesting that high inflation has a negative effect on economic performance and poverty. Typically, the argument that performance is weakened has been based either on the notion that inflation induces price dispersion or on the one that inflation reduces the information content of price changes, so that when households and businesses observe a price change, they find it more difficult to discern if it is a relative or absolute price change.[1] This effect is likely to affect both total factor productivity, via a reduction in efficiency of the allocation of resources, and capital accumulation, via a decline in investment due to the lower productivity. Not only is the level of output, therefore, lower, but the rate of growth is also adversely affected. It has further been argued that the variability of inflation, which tends to rise with the level of inflation, undermines economic performance by compounding the costs associated with uncertainty.

A number of empirical studies have investigated the impact of inflation on growth. These studies generally suggest that the impact is adverse only when inflation exceeds certain threshold levels and that the relationship is nonlinear (i.e., the lower the inflation rate, the less will be the impact of a given reduction in inflation). Using data for both industrial and developing countries, Gylfason and Herbertsson (2001) estimate the threshold at between 10 percent and 20 percent, Sarel (1996) estimates it at around 8 percent, and Ghosh and Phillips (1998) suggest it could be as low as 2.5 percent.

[1]For a broad theoretical analysis of the cost of inflation, see Driffill, Mizon, and Ulph (1990). For recent theoretical contributions offering microfoundations for negative welfare effects of inflation, see for example Tommasi (1999), Woodford (2003), and Zhang (2000).

For Bruno and Easterly (1998), it is only above 40 percent that inflation matters for growth. According to Khan and Senhadji (2001), the threshold depends on the level of development: developing countries experience a negative effect on growth when inflation reaches double digits, while for industrial countries the threshold is around 1–3 percent. Despite the high variability of the estimates about the threshold, these studies present reasonably similar estimates for the effect of inflation. Overall, it appears that, once the threshold has been passed, a doubling of inflation reduces per capita growth by about ½ of 1 percentage point.

An additional aspect of the cost of inflation is that it may hurt the poor relatively more than the rich. "The essential *a priori* argument is that the rich are better able to protect themselves against, or benefit from, the effects of inflation than are the poor" Easterly and Fischer (2000, p. 2). In particular, the rich are more likely to have better access to financial instruments that hedge in some way against inflation. The poor, particularly the elderly, may also depend more than the rich on income that is not fully indexed to inflation.

Over much of the past thirty years, empirical evidence appeared to provide conflicting results regarding the adverse effect of inflation on poverty. However, recent work (Easterly and Fischer, 2000; Romer and Romer, 1999) finds support for this effect. In particular, Easterly and Fischer (2000) find that the poor are more concerned about the impact of inflation on their standard of living than nonpoor and that inflation reduces real income and wages at the low end of the income distribution, thereby increasing poverty.

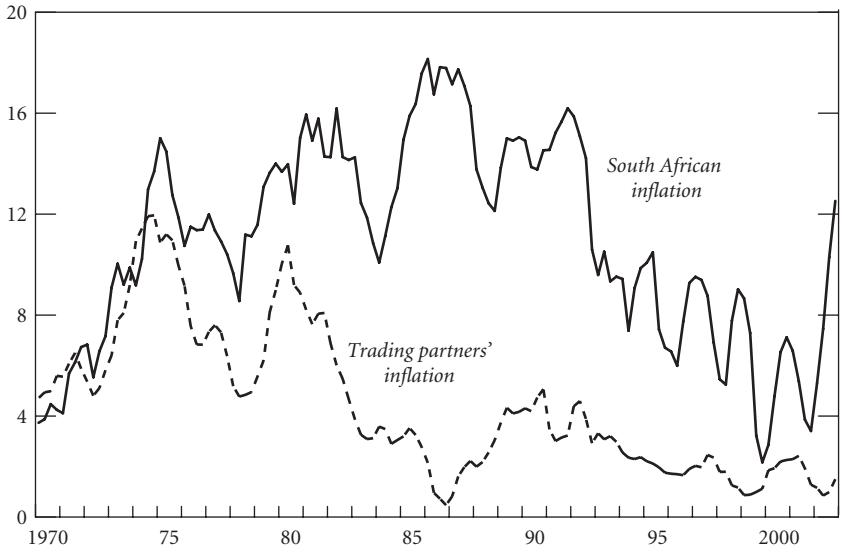
Inflation Developments in South Africa

Inflation in South Africa rose significantly during the 1970s and 1980s (see Figure 12.1). From 1980 until the early 1990s, it averaged about 14 percent. Since the early 1990s, however, inflation has exhibited a downward trend and averaged 7 percent between 1994 and 2002.

Over time, inflation developments in South Africa have been driven primarily by two factors: world inflation and domestic monetary policy.[2] Most countries around the world experienced an inflation surge in the 1970s, mainly as a consequence of oil price shocks. In the past two decades, however, most countries—and particularly South Africa's major trading partners—experienced a steady decline in inflation. This was reflected in lower imported inflation in South Africa, an effect magnified by the increasing openness of the economy.

[2]See Aron, Muellbauer, and Smit (2003) for a discussion of the role of import prices, real interest rates, and openness in determining inflation in South Africa.

Figure 12.1. Inflation in South Africa and in Its Trading Partners
(In percent)

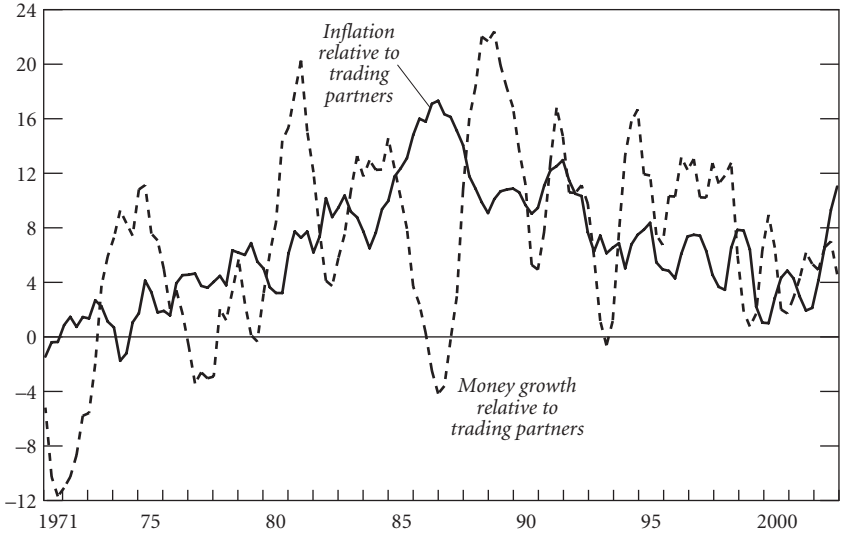


Sources: South African Reserve Bank; IMF, *International Financial Statistics;* and author's calculations.

Figure 12.1 shows that throughout the 1980s and part of the 1990s inflation in South Africa remained high despite disinflation in its trading partner countries. This was largely due to a weaker monetary policy stance; growth in broad money was substantially higher in South Africa than in its trading partners from the early 1980s until the end of the apartheid (Figure 12.2). Since the early 1990s, and particularly after the end of the apartheid, stronger monetary discipline has been reflected in a substantial decline in the inflation differential with trading partner countries.

What can explain the relatively loose monetary policy adopted in the 1980s and early 1990s? One possible culprit is the stance of fiscal policy. A number of papers have argued (see, for example, Catão and Terrones, 2003 and the references therein) that if government lacks fiscal discipline, persistently high fiscal deficits eventually require inflation to avoid an explosive expansion in public debt and a default. While this assertion has received empirical support elsewhere, it does not appear valid for South Africa, where the ratio of the fiscal balance to GDP has no stable long-run cointegrating relationship with either inflation or money growth. In fact, as is clear from Figure 12.3, fiscal policy has not been excessively loose over sustained periods and the level of public debt was kept at reasonably modest levels of below 40 percent relative to GDP (see Chapter 6).

Figure 12.2. Inflation and Monetary Policy Stance Relative to Trading Partners
(In percent)



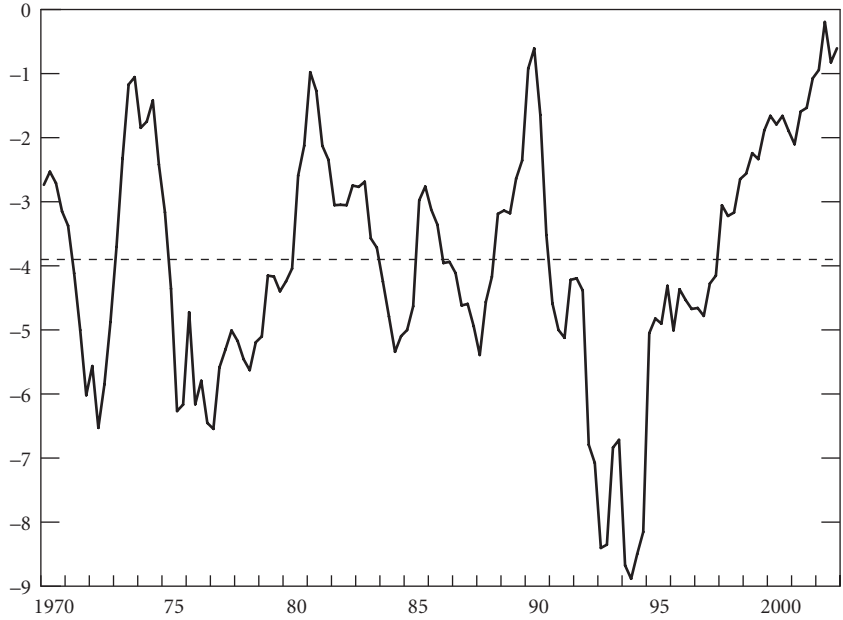
Sources: South African Reserve Bank; IMF, *International Financial Statistics;* and author's calculations.

It does not appear, therefore, that lax monetary policy was due to fiscal behavior. Rather, the evidence suggests that monetary policy was used to keep interest rates relatively low in order to stimulate economic activity (Figure 12.4). This was possible because for much of the period South Africa had in place a battery of exchange controls and faced economic sanctions that greatly reduced the mobility of international capital. As a consequence, South Africa's weak monetary stance was reflected in lower real interest rates than its trading partners, but, as is evident in Figure 12.4, this came at the cost of higher inflation. In the 1990s, the elimination of sanctions and the gradual liberalization of controls (see Chapter 8) was associated with a rise in real interest rates and a decline in inflation.

Lowering Inflation in South Africa

Until the mid-1990s, the South African Reserve Bank (SARB) was targeting the money supply as the primary policy strategy. This strategy was, however, abandoned during the mid-1990s, partly because of the perception that the relationship between money and prices was unstable and unpredictable. A cursory glance at the data certainly seems to bear this out

Figure 12.3. Fiscal Balance to GDP Ratios
(In percent)



Source: South African Reserve Bank.

(Figure 12.5). The first part of this section will discuss whether such an impression is robust to a more rigorous analysis.

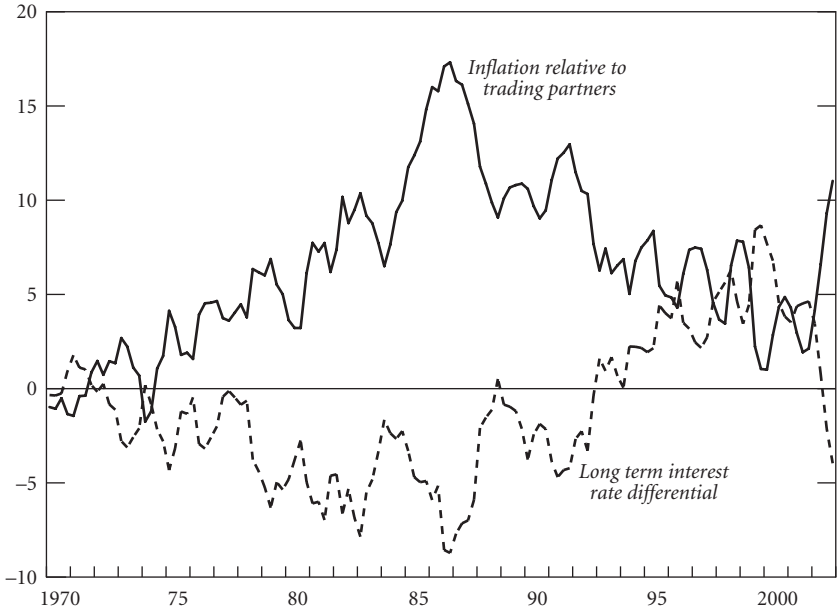
Since the mid-1990s monetary policy has slowly converged toward an inflation-targeting regime. An eclectic and informal approach to inflation reduction in the late 1990s was replaced with the inflation-targeting regime formalized in the 2000 budget. The second part of this section will discuss the merits of inflation targeting and develop a simple trend measure inflation for South Africa; this may be of use in guiding monetary policy operations.

Stability of Money Demand: Money Supply Targeting

Recent evidence suggests that there is in fact a stable long-run relationship between money, prices, income, and interest rates in South Africa (see Jonsson, 2001; Wesso, 2002; Bhundia, 2002; and Nell, 1999). The main results of these studies are:

- The long-run elasticity of nominal money demand with respect to the price level is close to 1.

Figure 12.4. Inflation and Real Interest Rates in South Africa Relative to Trading Partners
(In percent)

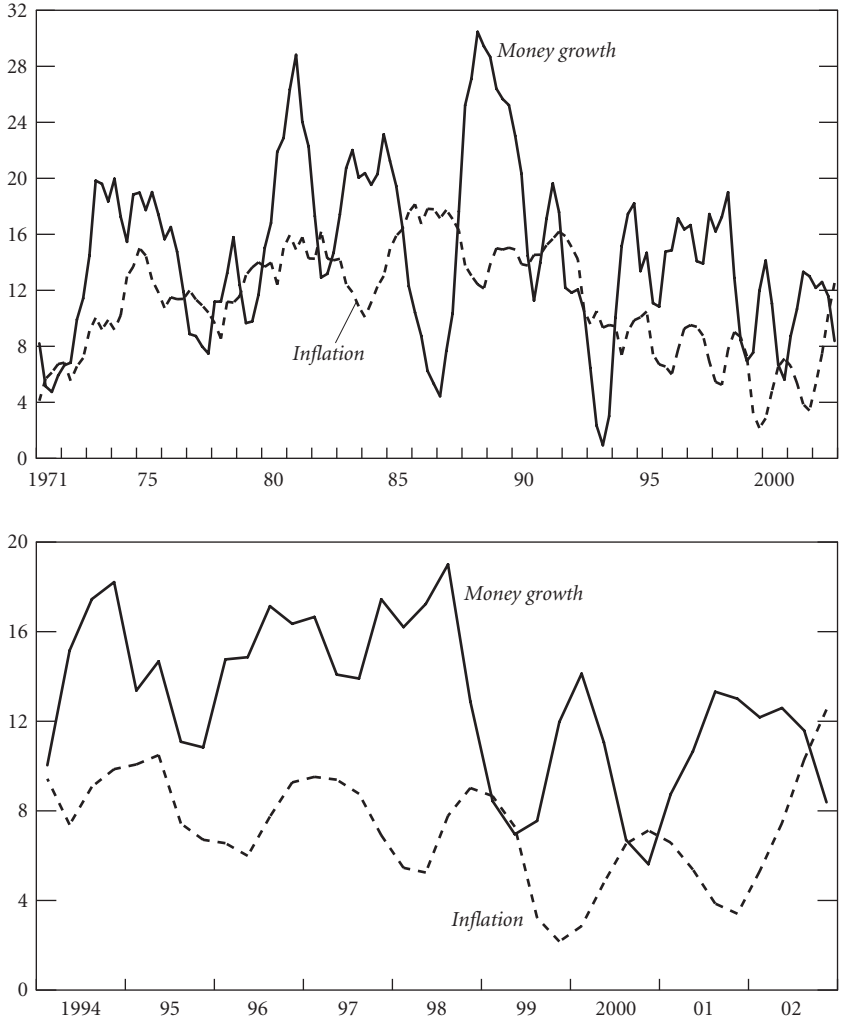


Sources: South African Reserve Bank; IMF, *International Financial Statistics;* and author's calculations.

- The income elasticity is generally found to be between 1 and 1½. An elasticity of less than 1 can be expected if there are economies of scale in holding money, but account needs to be taken of the impact of wealth effects and financial intermediation, which will tend to raise the estimated elasticity. Aron, Muellbauer, and Smit (2003) show that the wealth effect is present in South Africa, while Wesso (2002) found that, when using time-varying parameter estimations, the income coefficient increased over time, which is consistent with the impact of an increasing degree of financial intermediation.

- Regarding interest rates, Jonsson (2001) found that, for the real money (M3) demand, the long-run elasticity with respect to long-term interest rates (which capture the opportunity cost of holding money) is about negative 0.5 and the elasticity for short-term interest rates (which capture the own return) about 0.2. Wesso finds that, when taking into account the rates on bank deposits, adding inflation does not appear to play a role, most likely because the deposit rate compensates

Figure 12.5. Money Growth and Inflation over Different Time Periods
(In percent)



Source: South African Reserve Bank.

for the opportunity costs of holding M3, only a small part of which does not bear a deposit rate.

- These studies found no stable relationship for M0, M1, and often M2, probably because of composition shifts across monetary aggregates due to changes in financial intermediation (see Nell, 1999).

Table 12.1. Cointegrating Relationship for Money Demand (Log of M3)

Log (real GDP)	1.03
	0.191
Log (CPI)	1.07
	0.038
TREASURY	0.01
	0.004
BOND	–0.04
	–0.007

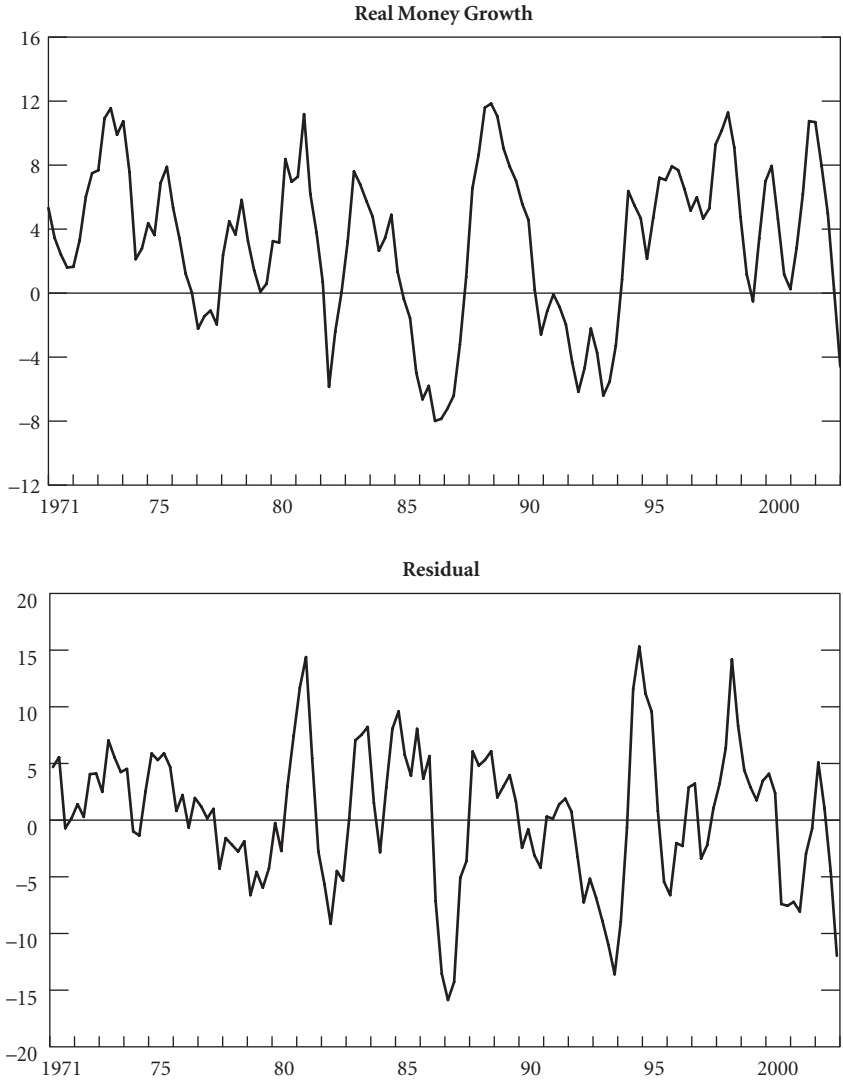
Note: Standard errors in italics.

We revisited these exercises, replicating the approach used by Jonsson (2001) with data through the last quarter of 2002, and again found evidence of a stable long-run money demand relationship (Table 12.1).[3] The elasticity of income and prices are close to unity. The opportunity cost of money is proxied by the interest rate on long-term government bond *(BOND)*, while the own return of money is proxied by the treasury bill rate *(TREASURY)*; most short-term interest rates, including those on bank deposits, are highly correlated. The semielasticity of the long- and short-term interest rate is about negative 0.04 and positive 0.013, respectively, suggesting that an increase in the former of 1 percentage point reduces money demand by 4 percentage points, while an increase in the latter of 1 percentage point raises money demand by around 1½ percentage points. Hence, if a rise in inflation by 1 percentage point is reflected in a corresponding increase in both long- and short-term interest rates, money demand will decline by about 2½ percentage points. In the vector error correction formulation, the adjustment coefficient is significantly estimated at negative 0.1, indicating a reversion of money toward its long-run money demand relationship, at a speed of 10 percent every quarter (a half life of deviations of slightly more than 1 year).

Can this relationship explain an occurrence, such as during 1995–98, when broad money growth consistently exceeded inflation by a considerable margin? To answer this question, we measured the changes in real money

[3]A vector error correction cointegration analysis was applied to all the variables in the money demand equation plus the exchange rate and foreign prices. The trace test finds evidence of 2 cointegrating vectors at the 1 percent critical value. In fact, for small open economies, the money demand equation is better estimated simultaneously with a real exchange rate estimation, each of which enters a different cointegrating relationship. Estimating only the money demand equation generates misleading results. For brevity, Table 12.1 reports only the money demand cointegrating relationship.

Figure 12.6. Real Money Growth and Unexplained Residual
(In percent)



Sources: South African Reserve Bank; and author's calculations.

demand that can be ascribed to income growth and changes in interest rates. Figure 12.6, upper panel, shows the fluctuations in real money balances, which highlight the presence of persistent deviations of money growth from inflation. Figure 12.6, lower panel, shows the residual fluctuations in real

Table 12.2. Interpreting the Long-Run Money Demand Relationship

	Contribution in Changes in Real Money Demand, 1995–98
Growth (year on year) in	
M3/CPI	6.8
GDP	2.7
Treasury bill rate (three months)	2.8
Long-term rate (10 years)	–0.3
Unexplained residual	1.6
Memorandum items	
M3	14.4
CPI	7.6
Treasury bill rate (three months)	1.4
Long-term rate (10 years)	0.1

Note: Percentage change based on log difference.

money balances that are not explained by the effect of changes in income and interest rates. Such residual fluctuations tend to be very short lived.

Table 12.2 provides an accounting of the money demand relationship during the period 1995–98, when money grew much faster than inflation. As is clear, most of the gap between money growth and inflation is explained by real GDP growth, which jumped to much higher levels than those prevailing before the end of the apartheid (see Chapter 2), and to higher short-term interest rates.

This section has argued that, contrary to popular perception, the money demand relationship has been reasonably stable. However, this does not imply that money supply targeting is preferable anti-inflation strategy. Recent experience in several industrial as well as emerging market countries has shown that the inflation-targeting approach has a number of advantages (see next section). Nonetheless, because of the stability of money demand, movements in monetary growth should be an important consideration for the SARB to take into account in implementing its inflation-targeting strategy.

Inflation Targeting

Since early 1990s, many industrial and developing countries have adopted inflation targeting as a formal approach to conduct monetary policy.[4] No

[4]There is an extensive literature discussing the characteristics and merits of inflation targeting. See Schaechter, Stone, and Zelmer (2000); Svensson (2000); Mishkin (2000); Giannoni and Woodford (2003); and Svensson and Woodford (2003).

country has yet abandoned this approach, and virtually all have significantly improved their inflation performance. Even though the implementation modalities differ across countries, the main features that appear responsible for success are shared by all countries.

(1) *Interest rates as main monetary policy tool.* Choosing interest rates rather than money growth allows central banks to shortcut the monetary policy transmission mechanism, as this mechanism acts—at least in part—via the effect of interest rates on aggregate demand. Such an approach reduces confusion arising from shifts in money demand when assessing the appropriateness of the monetary stance. In fact, with interest rate targeting, money demand shifts would simply affect money supply and could simply be neglected. Under money-supply targeting, money demand shifts that are not correctly identified as such could lead to unduly tight or loose monetary stance. Moreover, since information on interest rates is continuously available, the prevailing monetary policy stance is more apparent. However, inflation targeting requires flexibility in setting the interest rate, as the latter may need to adjust in order to offset shocks.

(2) *Explicit forward-looking target*. As changes in monetary policy typically affect inflation with a lag, monetary authorities publicly announce an inflation target to be met at some point in the future, and discuss the appropriateness of current monetary policy decisions for meeting the target.

(3) *The role of confidence in monetary policy*. Effective communications, independence and accountability of the central bank, and a successful track record enhance the credibility of the inflation targeting framework and confidence in the ability of the monetary authorities to deliver the inflation target. Credibility in turn makes inflation expectation more forward-looking, thus lowering the costs—in terms of output losses—of bringing down inflation (the "sacrifice ratio").

(4) *Muted response to transitory real shocks*. Inflation targeting central banks generally avoid responding to the direct inflationary impact of shocks that do not operate via domestic demand (such as oil price and terms of trade shocks). Since they tend, by their nature, to be temporary and since a policy response could lead to greater volatility in output, monetary policy typically is directed at offseting only the second-round effects of such shocks, such as the impact via inflationary expectations or wage-setting behavior.

A formal inflation targeting regime was announced in South Africa with the presentation of 2000/01 budget. A target range of 3–6 percent was established for the annual average rate of *CPIX* inflation starting in 2002. [5] The choice of the target would be a prerogative of the National Treasury. An escape clause was introduced in the 2001 Medium-Term Budget Policy Statement (MTBS) allowing the Reserve Bank to publicly define the target as temporarily nonbinding under special circumstances, such as supply shocks. A Monetary Policy Committee (MPC) would meet at the Reserve Bank every six weeks to assess monetary conditions and decide on the appropriate level of the repurchase interest rate (the key policy rate).

Several changes to the framework were subsequently made. The annual average target was replaced with a continuous year-on-year rolling target still at 3.6 percent. The escape clause was replaced with an explanation clause—the Reserve Bank would explain the reasons for deviations from the target and indicate by when the inflation rate was expected to return within the target range. The frequency of the MPC meetings was first reduced to four a year and subsequently increased to six a year.

Trend Measures of Inflation for South Africa

To assess the appropriateness of a monetary policy, central banks need to be able to predict inflation with a reasonable degree of accuracy and confidence. They typically do this through a combination of techniques ranging from sophisticated macroeconometric models to judgmental forecasts. This chapter develops one particular approach for South Africa, based upon work undertaken in the Bank of Canada.[6] The approach constructs measures of trend or core inflation by removing volatile components in order to predict future inflation. Sizable temporary shocks, in fact, would give a misleading signal of where inflation was heading. Central banks may, therefore, find it beneficial to avoid making policy decision based on movements in inflation driven by the more volatile components.

Future inflation can be considered as a weighted average of trend measure of inflation and current inflation, plus a residual:

$$\pi_{t+k} = a + b\pi_t^{TM} + (1 - b)\pi_t + \varepsilon_{t+k}, \qquad (1)$$

where π_t is current inflation, π_{t+k} is inflation k periods from now, and π_t^{TM} is the current trend measure of inflation. This relation can be rewritten as:

[5] *CPIX* is the CPI excluding the mortgage payments.

[6] See Bank of Canada (2001); Hogan, Johnson, and Lafleche (2001); and Macklem (2001).

$$\pi_{t+k} - \pi_t = a + b(\pi_t^{TM} - \pi_t) + \varepsilon_{t+k}. \quad (2)$$

If the trend measure of inflation properly captures underlying inflation patterns by excluding volatile components whose effect on inflation would dissipate in k periods, then such a measure should be a good predictor of inflation k periods ahead.[7] In this case, "a" and "b" should equal 0 and 1, respectively.[8]

The objective is to derive trend measures that provide the best fit for equation (2) with estimates for "a" and "b" as close as possible to 0 and 1, respectively. Trend inflation measures should therefore exclude items that (1) have high price volatility compared with the targeted price index, and (2) are subject to exogenous shocks that have only a temporary effect on inflation.[9] These latter items often relate to supply shocks, such as changes in oil prices, weather conditions, or indirect taxes.

In this application to South African data, high-inflation variability components of the *CPIX* are defined as those components for which inflation exhibits a standard deviation 2 or 3 times higher than the standard deviation (STD) of the *CPIX* inflation during 1994–2002.[10] In particular (see Table 12.3):

- The components with high-inflation variability at the 3 STD threshold are vegetables; meat; fruits and nuts; coffee, tea, and cocoa (among the food components); education; and cigarettes, cigars, and tobacco.

[7]The "k" of interest to policymakers is normally related to the lag of the monetary transmission mechanism.

[8]As an example, assume that (1) inflation is initially at its steady-state level, which equals the central bank target; (2) a trend measure excludes the price of oil and related components; (3) an oil shock brings current inflation up by 2 percentage points; and (4) the effect of such a shock is expected to disappear in k periods. Hence, current inflation would exceed the trend measure by 2 percent (i.e., $\pi_t^{TM} - \pi_t$ would equal minus 2 percent), abstracting from secondary effects from the price of oil. Also, in the absence of further shocks, inflation k periods ahead would be back to its initial level (i.e., $\pi_{t+k} - \pi_t$ would also equal minus 2 percent). Hence, in this case the trend measure would be a very good predictor of future inflation.

[9]The inflationary impact of the shock may be temporary either because the shock is likely to be reversed or because the shock can persist but lead only to a new price level rather than a different inflation rate.

[10]The price series for all the underlying components of *CPIX* are not publicly available. Hence, the analysis is based on the main data components that are available on the Statistics South Africa website. The official series of the *CPIX* starts only in 1997, so in order to create a longer time series in our analysis, a proxy for *CPIX* was constructed (called alternative *CPIX*), using the main components of the official CPI (metropolitan areas) and the weights in the official *CPIX* (metropolitan and other urban areas). Due to the lack of a separate series for mortgage interest components, housing in the CPI is used as a proxy. In the remainder of this section, *CPIX* will refer to our alternative measure. The analysis uses data from January 1980 to September 2002.

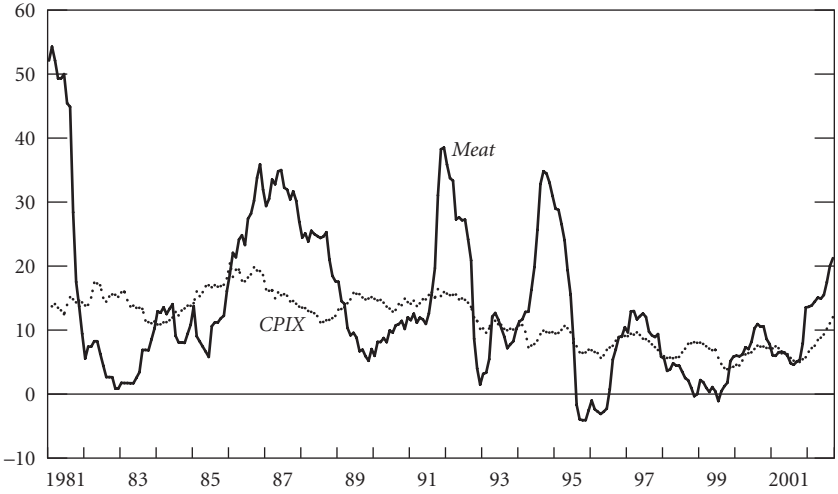
Table 12.3. Components of Consumer Price Inflation

	Average Inflation (In percent)			Standard Deviation			Weight in *CPIX* (In percent)
	1981–2002	1981–93	1994–2002	1981–2002	1981–93	1994–2002	Metropolitan and urban areas
Food	12.9	16.3	7.7	6.7	6.2	3.1	25.66
Meat	13.8	16.9	9.0	11.9	12.5	9.0	6.95
Grain products	12.5	15.7	7.8	5.9	4.7	4.1	4.84
Other food products	12.8	16.2	7.7	5.2	3.8	1.8	4.17
Vegetables	14.6	17.1	10.9	18.5	20.8	13.7	2.43
Milk, cheese, and eggs	12.5	15.3	8.2	6.0	5.5	3.9	2.34
Fruit and nuts	13.6	18.2	6.7	14.4	15.5	8.9	1.26
Coffee, tea, and cocoa	11.9	14.2	8.4	9.6	10.6	6.5	1.27
Fats and oils	11.0	12.3	9.1	6.1	6.4	5.1	0.93
Fish and other seafood	12.0	14.6	8.2	7.3	8.3	2.5	0.78
Sugar	12.4	15.6	7.7	5.9	5.5	2.1	0.69
Housing	9.4	11.5	6.3	7.0	6.2	7.1	11.57
Transport	11.7	14.7	7.1	6.3	6.1	3.0	15.30
Medical care and expenses	14.5	16.5	11.5	5.3	5.4	3.2	7.70
Household operation	13.7	15.4	11.1	4.4	4.3	3.0	5.22
Personal care	11.9	14.9	7.5	4.5	3.2	1.2	4.37
Fuel and power	10.6	12.6	7.8	4.1	4.1	1.3	4.28
Education	18.2	22.6	11.7	12.0	12.3	8.0	3.77
Other	10.8	15.1	4.5	6.8	4.6	4.2	3.63
Recreation and entertainment	9.6	13.8	3.3	7.1	6.1	2.1	3.39
Clothing and footwear	8.6	13.2	1.8	6.5	3.8	2.5	4.06
Communication	11.7	14.5	7.5	8.9	10.2	4.1	3.19

Furniture and equipment	9.0	12.4	3.9	5.1	3.5	1.6	3.15
Alcoholic beverages	12.4	15.7	7.6	5.7	5.0	1.9	1.70
Cigarettes, cigars, and tobacco	15.7	15.1	16.7	6.3	5.8	6.9	1.35
Nonalcoholic beverages	13.6	16.9	8.7	5.2	4.1	1.9	1.26
Reading matter	13.0	15.0	9.9	8.6	10.4	2.6	0.40
CPI—all items	11.4	14.3	7.2	4.2	2.5	2.3	
Alternative *CPIX*	11.6	14.3	7.4	4.0	2.3	1.7	100.00
2*standard deviation				7.9	4.5	3.5	
3*standard deviation				11.9	6.8	5.2	
CPIXF[1]	11.3	14.1	7.2	4.0	2.5	1.5	79.98
CPIXALL[2]	11.1	13.8	7.1	4.0	2.7	1.6	68.04
CPIXF3[1]	11.4	14.1	7.3	3.9	2.4	1.5	88.09
CPIXALL3[2]	11.2	14.0	7.0	4.0	2.5	1.6	82.97

Sources: Statistics South Africa; and calculations by Matthias Vocke.
[1]*CPIXF* and *CPIXF3* eliminate food components with STD 2 (or 3) times higher *CPIX* STD (1994–2002).
[2]*CPIXALL* and *CPIXALL3* eliminate all components with STD 2 (or 3) times higher *CPIX* STD (1994–2002).

Figure 12.7. Alternative *CPIX* Inflation Versus Meat Price Inflation
(In percent)



Source: South African Reserve Bank.

Note: Weight of meat in *CPIX:* 6.95 percent. Standard deviations 1981–93: *CPIX* inflation: 2.27 percent; meat price inflation: 12.49 percent. Standard deviations 1994–2002: *CPIX* inflation: 1.74 percent; meat price inflation: 9.03 percent.

Housing is also highly volatile due to mortgage rates (remember that in this exercise, *CPIX* is a constructed measure on the basis of CPI components and that a separate series for the mortgage component is not available). A very volatile measure with a sizable weight in *CPIX* is plotted against *CPIX* in Figure 12.7.

- The components with high-inflation variability at the 2 STD threshold include grain products; milk, cheese, and eggs; fats and oils; communication; and the item "other."

Four measures of trend-inflation were constructed:

- *CPIXF* excludes from the alternative *CPIX* the food components with a STD of inflation two times the STD of the *CPIX*.
- *CPIXF3* excludes the food components with a STD of inflation three times the STD of the *CPIX*.
- *CPIXALL* excludes all components with a STD of inflation two times the STD of the *CPIX*.
- *CPIXALL3* excludes all components with a STD of inflation three times the STD of the *CPIX*.

Table 12.4. Regression Results: Sample, January 1994–September 2002
$(\pi_{t+k} - \pi_t = a + b(\pi_t^{TM} - \pi_t) + \varepsilon_{t+k})$

k = +6	Estimates		p-values			
Measures	a	b	a=0	b=1	a=0 and b=1	R^2
DCPIXF	0.04	–0.18	*0.86*	*0.00*	*0.00*	0.01
DCPIXALL	0.00	–0.16	*0.99*	*0.00*	*0.00*	0.01
DCPIXF3	0.07	0.08	*0.74*	*0.00*	*0.00*	0.00
DCPIXALL3	0.01	0.07	*0.66*	*0.00*	*0.00*	0.00
k = +12	Estimates		p-values			
Measures	a	b	a=0	b=1	a=0 and b=1	R^2
DCPIXF	–0.06	1.17	*0.81*	*0.29*	*0.48*	0.19
DCPIXALL	0.12	0.97	*0.63*	*0.86*	*0.82*	0.17
DCPIXF3	–0.04	1.30	*0.86*	*0.06*	*0.10*	0.23
DCPIXALL3	0.31	1.29	*0.25*	*0.78*	*0.20*	0.21
k = +18	Estimates		p-values			
Measures	a	b	a=0	b=1	a=0 and b=1	R^2
DCPIXF	–0.31	1.06	*0.09*	*0.62*	*0.02*	0.31
DCPIXALL	–0.11	0.98	*0.58*	*0.86*	*0.83*	0.33
DCPIXF3	–0.32	0.99	*0.10*	*0.98*	*0.10*	0.26
DCPIXALL3	–0.05	0.96	*0.79*	*0.76*	*0.94*	0.22
k = +24	Estimates		p-values			
Measures	a	b	a=0	b=1	a=0 and b=1	R^2
DCPIXF	–0.45	0.04	*0.21*	*0.00*	*0.00*	0.00
DCPIXALL	–0.43	0.05	*0.02*	*0.00*	*0.00*	0.00
DCPIXF3	–0.45	0.01	*0.02*	*0.00*	*0.00*	0.00
DCPIXALL3	–0.48	–0.06	*0.01*	*0.00*	*0.00*	0.00

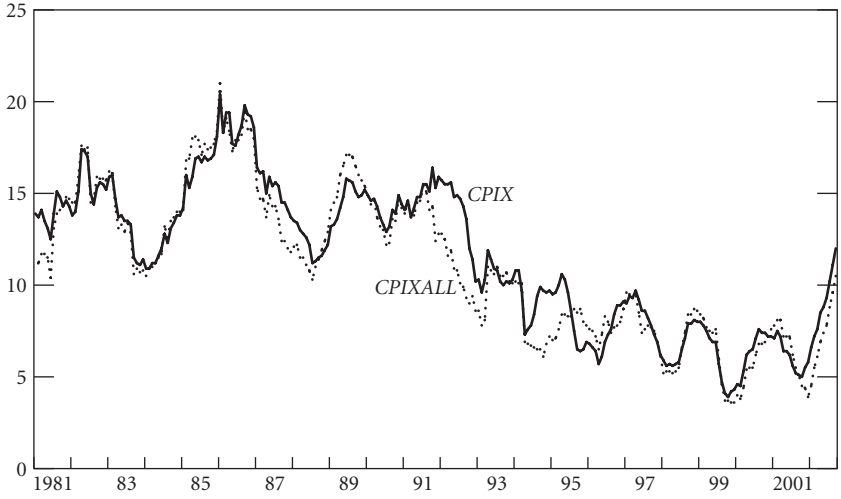
Note. *D* before a variable denotes log-deviation (hence inflation rate in that variable); *CPIXF* and *CPIXF3* eliminate food components with STD 2 (or 3) times higher *CPIX* STD (1994–2002); *CPIXALL* and *CPIXALL3* eliminate all components with STD 2 (or 3) times higher *CPIX* STD (1994–2002); p-values: the null hypothesis (a=0, b=1, a=0 and b=1) cannot be rejected if p-value is larger than significance level.

Equation (2) was estimated with *CPIX* inflation, the four trend measures, and four different horizons (6, 12, 18, and 24 months), thus encompassing 16 cases. Table 12.4 presents the regression results, which can be summarized as follows:

- The trend measures *CPIXALL* (plotted against *CPIX* in Figure 12.8) and *CPIXALL3* are good predictors of the *CPIX* 18 months ahead.[11]

[11]For the case of *CPIXALL* and *CPIXALL3*, one cannot reject the joint hypothesis that a = 0 and b = 1 (the p-value is as high as 0.84 and 0.94, respectively, well above any standard significance level of 0.1, 0.05, or 0.01). The R-squared is somewhat low, but not worse than those reported in Table 3 of Macklem (2001).

Figure 12.8. Alternative *CPIX* Inflation Excluding All Volatile Components (More Than Two Standard Deviations)
(In percent)



Sources: South African Reserve Bank; IMF, *International Financial Statistics;* and author's calculations.

Note: Coverage of *CPIX:* 68.04 percent. Standard deviations 1981–93: *CPIX* inflation: 2.27 percent; *CPIXALL* inflation: 2.72 percent. Average inflation rate 1981–93: *CPIX* inflation: 14.3 percent; *CPIXALL* inflation: 13.8 percent. Standard deviations 1994–2002: *CPIX* inflation: 1.74 percent; *CPIXALL* inflation: 1.61 percent. Average inflation rate 1994–2002: *CPIX* inflation: 7.5 percent; *CPIXALL* inflation: 7.1 percent.

- However, *CPIXALL* performance is superior in terms of predictability both 12 and 18 months ahead.
- All measures are poor predictors 6 months or 24 months ahead.

Are There Costs in Achieving Lower Inflation?

Hodge (2002) finds that in South Africa there is a limited trade-off between inflation and growth, but not between inflation and unemployment. Reducing inflation would thus imply a small cost in terms of temporarily lower growth. Unemployment in South Africa is very much associated with structural and institutional factors (see Chapter 3) and probably does not react significantly to aggregate demand conditions. It is, however, difficult to quantify the temporary output cost of reducing inflation as the estimation in Hodge (2002) is sensitive to the methodology employed. The cost of lowering inflation declines with the quality of the inflation-

targeting institution and the credibility of the commitment to the inflation objective, which are normally reflected in a decline of inflation expectation (see, for example, Laxton and N'Diaye (2002) and Levin, Natalucci, and Piger (2004). Looking forward, this may not be a particularly important policy issue since most of the inflation reduction has already occurred.

Looking Forward

At its inception, the inflation-targeting regime was undermined by the inflationary pressures arising from a large depreciation of the currency (almost 25 percent in real effective terms percent in 2001), large increases in food prices due mainly to regional shortages of maize, and an excess creation of liquidity in 2001.

Emerging markets such as South Africa are likely to remain more vulnerable to inflationary shocks than industrial economies. There are several reasons for this. First, emerging markets tend to be less diversified and, therefore, more exposed to a particular sectoral shock. Second, their smaller relative size with respect to the rest of the world renders them more prone to the impact of external shocks, both via the current account, such as changes in commodity prices, and via the capital account, such as changes in capital flows. And third, their "emerging" nature implies greater uncertainty regarding economic and policy performance. This uncertainty, compounded by the high degree of asymmetry of information between international investors and domestic agents, may be associated with volatile capital flows, and therefore exchange rates, in reaction to relatively minor shocks.[12]

In such circumstances, the credibility of the inflation-targeting regime can anchor inflation expectations whenever shocks occur. Such an anchor will reduce the possible output losses that may be involved in keeping inflation on track. The convergence of inflation expectations with the inflation target over the past year suggest that confidence in the ability of the central bank to consistently meet the target has increased.[13]

It may be possible, however, for confidence to be strengthened further. In an ideal scenario where the private sector has full confidence in the SARB commitment and full understanding of the inflationary behavior of the economy, there should be little surprise in the policy decisions of the Monetary Policy Committee (unless SARB just acquired information

[12]See Plenderleith (2003).

[13]See the Bureau of Economic Research Survey (www.ber.sun.ac.za) of inflation expectations.

that is not yet public). Even when inflation was already within the target, during the second half of 2003, market expectation about monetary policy decisions were often off the mark. While it is virtually impossible to reach the ideal scenario, several factors may help getting closer to it. On the one hand, repeated success in either achieving the target or forecasting temporary deviations of inflation from the target due to temporary shocks is crucial in making inflation expectations more forward looking and in anchoring these expectations to the target. On the other hand, continuous public updating of accurate inflation forecasts, complemented with the explanation of the appropriateness of the monetary policy stance, is crucial in improving communication with the public and in avoiding surprises.

Overall, the improvement in inflation performance during the second half of the 1990s has also been accompanied by an improvement in the institutional setup for the conduct of monetary policy, which sets the stage for a potentially smooth inflation performance in the coming years.

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