

## INFLATION TARGETING: ASSESSING THE EVIDENCE

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### Abstract

The aim of this chapter is to deal with the empirical aspects of the ‘new’ monetary policy framework, known as Inflation Targeting. We review the evidence for both developed and emerging economies. The emphasis, though, is on emerging economies, which can be thought of as preparing the ground for the chapter to follow that concentrates on the experience with inflation targeting in Brazil. The results gathered in this study demonstrate that although Inflation Targeting has gone hand-in hand with low inflation, it is very far from declaring the strategy a resounding success. The evidence produced in this chapter suggests that non-Inflation-Targeting central banks have also been successful on this score. At a general level this chapter should be read as providing the necessary prolegomena for the chapter that follows, which concentrates crucially on the Brazilian experience.

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### 1. Introduction

Inflation Targeting (IT) as a policy framework, designed to tame inflation, has been with us since the early 1990s. Recent work makes the point that a significant number of countries adopted this strategy, and the number is growing. For example, Sterne (2002, Appendix A) suggests that 54 countries pursued one form or another of IT by 1998, compared with only 6 in 1990. A more recent study (IMF, 2005) suggests that 21 countries (8 developed and 13 emerging) are now clear inflation targeters, pursuing a full-fledged IT strategy (FFIT in short). Indeed, a number of other countries are seriously considering the adoption of this strategy. Many studies have attempted to examine empirically the degree and extent of the impact of IT on inflation in various countries. We review this literature in what follows and conclude that the available empirical evidence produces mixed results, although the case with developing countries is less clear-cut.

In pursuing an IT strategy, countries commit themselves to price stability as the main objective of monetary policy, along with stipulating that medium-to-long-term inflation is the nominal anchor where an inflation target is set. There are, of course, varying degrees of commitment to IT amongst countries. In more general terms, one may distinguish between three types of inflation targeting: the FFIT as suggested above, the ‘Inflation Targeting Lite’ (ITL) type, and the ‘Eclectic Inflation Targeting’ (EIT) type.<sup>1</sup> The main distinguishing feature is the degree of clarity and institutional commitment to price stability.<sup>2</sup> Along with this commitment, an explicit inflation targeting (either point- or range-inflation target) is adopted; absence of other nominal anchors, policy instrument independence and absence of fiscal dominance, transparency, accountability and credibility of the commitment to IT by the central bank (Mishkin and Schmidt-Hebbel, 2001; Stone, 2003; Carare and Stone, 2003; Kuttner, 2005: see, also, Porter and Yao, 2005). FFIT countries enjoy a medium to high degree of credibility and clarity in pursuing IT, along with a transparent framework that adheres to accountability of the central bank to the set target, and adhering to the rest of the distinguishing features to which we have just referred. These countries cannot achieve and maintain low inflation without a clear commitment to IT, so that they are forced to sacrifice output stabilization to various degrees. ITL countries enjoy a relatively low credibility. This is a regime where central banks “announce a broad inflation objective but owing to their relative low credibility they are not able to maintain inflation as the foremost policy objective” (Stone, 2003, p. 8). This is due essentially to their vulnerability to large economic shocks, and to their weak institutional framework and financial instability. EIT countries have a very high degree of credibility, which allows them to achieve and maintain low and stable inflation without full adherence to the rules of IT. These ingredients, and their financial stability, enable these countries to pursue the output stabilization objective along with price stability.

In this chapter we focus on those countries that pursue a FFIT strategy, but we refer to the other two categories as necessary in what follows. The FFIT strategy dictates that countries commit themselves to achieving a targeted inflation rate and announce a relevant framework to achieve the set target. This approach is based on the belief that inflation is negatively related to economic growth in the long run, and, also, that high inflation is associated with high inflation variability, which is harmful

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<sup>1</sup> Truman (2003), however, does not see much value in this classification scheme, branding it as ‘dressed-up self-destruction’.

<sup>2</sup> A widely-cited definition of price stability has been offered by Greenspan (1988): “By price stability, I mean a situation in which households and businesses in making their saving and investment decisions can safely ignore the possibility of sustained, generalized price increases or decreases”.

to the economy.<sup>3</sup> If authorities are allowed discretion in monetary policy, they produce ‘surprise’ inflation especially so for electoral benefits, which leads to the well known by now time-inconsistency problem. Such a problem, though, can be avoided if the government delegated to an independent central bank the role of monetary policy, based on a principal-agent relationship between the government and the central bank. The government sets the broader goal of monetary policy, while the central bank has complete discretion to use its instrument to achieve the target in view of its goal. The new monetary policy framework thereby gives ‘constrained discretion’ to the independent central bank to respond to new information, an important dimension of the new framework given information asymmetries and policy lags, while at the same time putting in place rules in the conduct of monetary policy.<sup>4</sup>

We proceed by reviewing the existing empirical evidence and by identifying a number of questions that emerge from this inevitably short review. We examine these questions subsequently, all in section 2. Section 3 deals with problems that are more specific to the emerging countries. Section 4 summarizes and concludes.

## 2. Existing empirical evidence

In the mid-1990s, Leiderman and Svensson (1995) reviewed the early experience with IT, with, however, rather limited number of observations. Later studies (Bernanke et al., 1999; Corbo et al., 2001, 2002; Clifton et al., 2001; Arestis et al., 2002; Johnson, 2002, 2003; Neumann and von Hagen, 2002; Scott and Stone, 2005) inevitably afforded longer periods and more data. Overall, this evidence supports the contention that IT matters. Those countries which adopted IT, managed to reduce inflation to low levels and to curb inflation and interest rate volatility. Anecdotal evidence has also been propounded to make the IT case. Bernanke (2003) suggests that “central banks that have switched to inflation targeting have generally been pleased with the results they have obtained. The strongest evidence on that score is that, thus far at least, none of the several dozen adopters of inflation targeting has abandoned this approach” (p. 1). However, and interestingly enough, the Reserve Bank of New Zealand, the first central bank to have introduced IT, has worried about the consequences of volatile nominal exchange rates, and has resolved to setting up a new Policy Targets Agreement to alleviate the situation (see, for example, Bollard, 2002).

This evidence, however, is marred by three weaknesses (see, also, Neumann and von Hagen, 2002): the first is that the empirical studies reviewed fail to produce *convincing* evidence that IT improves inflation performance and policy credibility, and lower sacrifice ratio. After all, the environment of the 1990s was in general terms a stable economic environment, “a period friendly to price stability” (Neumann and von Hagen, 2002, p. 129), and inflation was on a downward trend in many countries, especially developed countries, prior to the introduction of IT; inflation persistence continued to drop after the introduction of IT (Sikklos, 1999), helped by the increase in the degree of risk aversion to inflation volatility in inflation-targeting countries in the 1990s. So that IT may have had little impact over what any sensible strategy could have achieved; indeed, non-IT countries also went through the same experience as IT countries (Cecchetti and Ehrmann, 1999). Furthermore, Honda (2000) finds no evidence that IT had an effect on either inflation or any other variable in Canada, New Zealand and the UK. The second weakness is that despite the problem of lack of convincing evidence, the

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<sup>3</sup> Further implications of the IT strategy include: a long-run vertical Phillips curve; inflation is a monetary phenomenon in as much as it can only be tackled by monetary policy in the long run; and NAIRU is a supply-side phenomenon determined essentially by market flexibility, especially labour market flexibility.

<sup>4</sup> The strategy contains the single objective of price stability for monetary policy, and not output stabilization, to avoid the time-consistency problem and thus the inflationary bias referred to in the text. This is consistent with the monetarist view that in the long run monetary policy can only affect inflation and not real variables.

proponents argue very strongly that non-adoption of IT puts at high risk the ability of a central bank to provide price stability (for example, Bernanke et al., 1999, ‘submit a plea’ for the Fed to adopt it; also Alesina et al., 2001, make the bold statement that the European Central Bank could improve its monetary policy by adopting IT; both studies do not provide any supporting evidence, though). And yet, both the Fed and the European Central Bank remain highly sceptical (Gramlich, 2000, and Duisenberg, 2003, do not actually regard IT appropriate for the US and the euro area, respectively). The third weakness refers to the argument that in a number of countries (for example, New Zealand, Canada and the UK) inflation had been ‘tamed’ well before introducing IT (Ball and Sheridan, 2003).

The studies that deal with the IT empirical evidence, ask a number of questions with the most pertinent being the following: first, whether IT improves inflation performance and persistence; a second aspect treated in the literature deals with the improvements in policy credibility and the ability to predict inflation under IT; a third group of studies consider whether the sacrifice ratio, i.e. the cost of lowering inflation, does not increase significantly over the period of IT implementation; a fourth range of issues stems from considering whether Central Banks’ behavior change under IT regimes. Finally, the effect of the introduction of the IT new regime on the behaviour of other relevant macroeconomic variables, for example on the exchange rate, is assessed. We pursue this distinction in what follows below, and discuss the evidence under several headings.

## **2.1 Evidence of IT impact on levels and persistence of inflation**

Studying the first of these issues, Mishkin and Posen (1997) find that IT has proved an effective ‘strategy’ in the fight against inflation, especially in maintaining the benefits of registering low inflation levels. These authors base their argument on the premise that whenever IT was adopted, the countries experienced inflation rates and interest rates, which were lower than the magnitudes simulated with unrestricted VARs, while no major effect is apparent on the output. Besides, in the three IT countries considered, New Zealand, Canada and the UK, disinflation had largely been completed when IT was adopted, but inflation did not bounce back as expected with business cycle expansions as it had in the past. The evidence produced by the same study, however, does not enable the authors to support the contention that IT is superior to money supply targeting (for example, the Bundesbank monetary targeting between 1974 and 1998), or to the Fed’s monetary policy in the 1980s and 1990s (which pursued neither a monetary nor an inflation targeting policy). Similar results are provided by Debelle (1997), who compares average inflation levels for seven IT countries with G7 countries excluding non-ITers. This contribution finds a much steeper decline in inflation in the case of the former group, concluding that IT is useful for countries facing lack of anti-inflation credibility. Newmann and von Hagen (2002) interpret similar results as a process of ‘convergence’, in that on average IT countries converge to the inflation rates of the non-IT countries in the targeting period. Corbo et al. (2002) are able to conclude that IT countries have been able to meet their inflation targets and reduce inflation volatility. Chortareas et al. (2002) make the important point that central bank transparency is always important under both IT and non-IT regimes. Indeed, the more detailed the publication of central bank forecasts the more it is associated with lower inflation rates.

Ball and Sheridan (2003) produce evidence that is not quite supportive of these conclusions. They study the effects of IT on macroeconomic performance in the case of twenty OECD countries, seven of which adopted IT in the 1990s. After controlling for the effect of regression to the mean, they conclude that they are unable to find any evidence that IT improves economic performance as measured by the behaviour of inflation, output and interest rates. As in the previous literature, they find that inflation fell in countries which adopted IT and became more stable; and output growth stabilized during the IT period as compared to the pre-IT period. But the apparent benefit disappears

altogether after accounting for the effect of regression to the mean, referred to above. According to these authors, the apparent success of IT countries is merely due to having “high initial inflation and large decreases, but the decrease for a given initial level looks similar for targeters and non-targeters” (Ball and Sheridan, 2003, p. 16). The same result prevails in the case of inflation variability and inflation persistence. As to whether IT affects output and interest rates, the same study concludes in the same vein that IT does not affect output growth or output variability, nor does it affect interest rates and their variability. In view of this evidence, the authors are suspicious of the results reported in the rest of the literature.<sup>5</sup> Furthermore, the evidence collected by Pétursson (2004) for the ‘Longest History IT Countries’ (*LHITCs*), that includes New Zealand, Canada, UK, Sweden and Australia, reaches similar conclusions, producing only a marginally significant or non-significant effect of IT adoption on inflation level. According to the author this is due to the fact that IT countries had accomplished a substantial part of the disinflation process before adopting IT. This strategy would have been implemented, therefore, in order to lock-in previous successes in controlling inflation more than to facilitate disinflation.

IT may also have an impact on the relationship between current inflation and its past history. Using univariate time series, Sikklos (1999) finds that the autoregressive coefficients show a noticeable drop in the strength of the relevant relationship for countries such as New Zealand, Canada, Finland, Sweden and Spain. Similarly, Levin et al (2004) find that actual inflation exhibits lower persistence in IT countries, and that the total variance of actual inflation is only slightly higher than the variance for shocks to the autoregressive model, whereas it is twice as big or higher in the case of non-IT countries, thereby exposing a substantial degree of propagation in the latter. They conclude that, as the variance of inflation is roughly the same in both groups, low levels of inflation persistence prevented higher levels of inflation volatility in IT countries. Uhlig (2004) takes issue with the estimation of the autoregressive model by Levin et al. (2004). He maintains that on the assumption that inflation is the sum of a trend plus noise, expected inflation should be modeled against the trend instead of actual inflation, which is just a noisy signal of this regressor. The result would lead to a downward bias, positively correlated with IT shocks. As IT countries present higher volatility, the bias would be larger for this group of countries. Finally, he recommends the use of a fully specified model including a signal-extraction-type equation.

Opposite views are expressed by Ball and Sheridan (2003), who, as mentioned earlier, report no significant improvements regarding inflation persistence after the adoption of IT. Further results on inflation persistence are reported in Vega and Winkelried (2005), who find that persistence depends on the measure selected to detrend the series of inflation. When the average across the period is selected they find that IT increases persistence (though the estimates are not significant). Allowing for a varying mean of inflation computed with the Hodrick-Prescott filter, IT does reduce the persistence parameter. It is important to note at this stage that detrending non-stationary series using a fixed average is not clear. The Hodrick-Prescott filter as a detrending algorithm is criticized in the literature for its *ad hoc* mechanism, which creates spurious cycles (Harvey and Jaeger, 1993).

## 2.2. Evidence of IT impact on inflation expectations

The evidence on this front is as unclear as on the aspect under section 2.1. Pétursson (2004) compares the average standard deviation of actual inflation in the 5 years previous to IT introduction with that corresponding to the following year of IT introduction, to suggest that adoption of IT contributes to reduced fluctuations in inflation. It is also pointed out in the same study that this is

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<sup>5</sup> Hyvonen (2004), however, challenges the Ball and Sheridan (2003) conclusions on the premise that mean reversion does not happen by itself. In the absence of a policy framework such reversion does not occur.

also the case for non-IT targeters, and it should not be surprising as both groups of countries present lower inflation levels. Similarly, Debelle (1997) reports a significant decline in the spread of long bond yields in IT countries relative to US (used as a benchmark). The author considers this change as an indicator of enhanced credibility, but points out that other factors may have also contributed to this apparent success. The evidence of Ball and Sheridan (2003), however, contradicts these results. Controlling for regression to the mean, they find that IT raises the standard deviation of inflation in the countries included in their sample.

Johnson (2002) provides evidence that shows significant impact on inflation expectations following the adoption of IT regimes in developed countries. Controlling for the business cycle and for the ongoing fall in inflation rates, the author reports a substantial reduction in the private expectations of inflation levels after IT announcements. In line with this evidence, Levin et al (2004) find that a one-year ahead expected inflation in response to actual inflation is lower in absolute values for IT countries than for non-IT countries. So that the persistence of inflation among IT countries is found to be less than among non-IT countries. More mixed, though, is the evidence gathered in the exercise undertaken by Johnson (2003) where actual forecasts undertaken by professional forecasters are compared with predicted forecasts according to a model on how these expectations are formulated, for five consecutive 12-month periods after the announcement of inflation targets. Predicted forecasts of inflation rates are determined by a number of variables: past inflation rates, current unemployment rates (assumed to capture the state of the domestic business cycle), current world inflation, and current world unemployment that depicts the state of world business cycle. This study isolates the additional effect of the announcement of inflation targets on the level of expected inflation in the case of Australia, Canada, New Zealand, Sweden and the UK (where most of the responses on expected inflation come from professional forecasters). Immediate reduction in expected inflation is registered in New Zealand and Sweden with a smaller effect and slower impact in Australia and Canada; inflation targets do not appear to have a significant impact in the UK.

The possibility of IT anchoring significantly long-run expectations is studied in Levin et al (2004). Private sector inflation forecasts of horizons of 5 to 10 years are uncorrelated with previous records of inflation in IT countries, while this is not the case for the US, Japan and countries from the European Union (EU). Variability of expectations, however, does not decrease according to the evidence produced by Johnson (2002). This author controls for past level and variability of inflation, finding that neither the variability of expected inflation nor the average absolute forecast error present significant additional reductions, beyond the effect through the drop in inflation. By contrast, Corbo et al. (2001) finds that IT has reduced inflation uncertainty and inflation forecast errors towards the low level prevalent in non-targeting industrial countries.

A clear success for the IT strategy is recorded in Levin et al (2002) regarding the objective of de-linking expectations from realized inflation. Their reported estimations suggest that long-term expectations have been less responsive to recorded patterns of past inflation in IT countries than in non-IT countries. In the latter case, the relevant estimates are insignificant at a 6-to-10-year horizon. This finding implies that long-term expected inflation rates are related to shifting views of the long-term course of monetary policy (see, also, Ball and Sheridan, 2003).

Finally, Pétursson (2004) finds that interest rates have fallen significantly more than inflation for all countries and in particular for the *LITHCs* where controls for business cycles and the general global fall in world interest rates are included. This suggests that more weight is placed on long-run developments in expectations in IT countries, and that IT is interpreted with flexibility, considering also real and financial stability as determinants of interest rates. Increased credibility is not, however, immediate. The ‘announcement’ effect is shown not to be enough and only when real progress and

the will by central banks to accept a temporary contraction became apparent was credibility achieved.

### 2.3 Evidence of IT impact on disinflation costs

Bernanke et al. (1999) produce an assessment of the real output costs related to disinflation, using sacrifice ratios and parameter instability tests. Following the method suggested by Ball (1994), they use a moving average process with nine lags to compute a trend in inflation and assume an *ad hoc* method to compute the GDP trend.<sup>6</sup> They then compute the sacrifice ratio and find that disinflation does not appear to be less costly than it would have been the case, had IT not been adopted. They also estimate Phillips curves for the periods before and after IT, rejecting the hypothesis of instability in the parameters estimated for these functions. Corbo et al. (2001) calculate the sacrifice ratios as the cumulative GDP variation to a trend utilizing the Hodrick-Prescott filter, divided by the corresponding inflation change in any period. Inflation targeting improvements are registered with important decreases in sacrifice ratios in Canada, Australia and the UK, but also a relevant deterioration is reported in New Zealand and Sweden. Corbo et al. (op. cit) are able to conclude that sacrifice ratios have declined in emerging IT countries, with output volatility having fallen in both developed and emerging countries after they had adopted inflation targeting. The fall reached levels similar, if not lower, to those of non-IT developed countries.

Clifton et al (2001) estimate Phillips curves that incorporate inflation expectations. They conclude that IT enhanced the credibility of central banks, which adopted IT. In IT countries and in the pre-IT periods, inflation expectations were backward looking, but after the IT adoption expectations turned both backward- and forward-looking. They also find that the unemployment-inflation trade-off improved in OECD countries after IT. This is not clear, however in the period immediately after its implementation, but it improves over time as monetary policy gains in credibility. According to the authors, this pattern could explain Bernanke et al. (1999) earlier results.

### 2.4 Evidence of IT impact on the conduct of monetary policy

The evidence as to whether IT changed the way in which monetary policy is conducted is analyzed in a number of ways and the outcome is mixed. Mishkin (2002) finds that the results of estimating Taylor rules suggest that central banks focus more on the control of inflation after IT adoption, in their attempt to achieve price stability. This result is supported by the VAR evidence, which indicates that the relative importance of inflation shocks as a source of the variance of interest rates rises after IT adoption. Mishkin (2002) in discussing Neumann and von Hagen (2002), however, points out that since both short-term and long-term coefficients on inflation in the Taylor rules estimated relationships, are less than 1, the inflation process is highly unstable. The implication here being that when inflation rises the central bank increases the rate of interest by a smaller amount than that required, thereby reducing the real rate of interest. This is of course an inflationary move by the central bank when the opposite is intended, and it is also true for the non-IT countries, like the US. This is a result that is contrary to Taylor's (1993) findings. In the latter study, the relevant coefficient is greater than 1 in the case of the US in the post-1979 period, when allegedly monetary policy performance improved relative to the pre-1979 period, when more emphasis was placed on controlling inflation.

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<sup>6</sup> A problem with the Ball (1994) approach is that the model relies on the absence of supply shocks, so that all deviations of actual output from potential output are attributed to policy induced demand contraction (Cechetti, 1994). This could potentially have substantial effects on the results (King and Watson, 1994).

Mishkin (2002) identifies another interesting problem, which relates directly to the VAR approach. This problem originates from the fact that this approach does not contain any structural model of dynamics, so that the interpretation that inflation shocks contribute to the variance of interest rates do not necessarily imply increased focus on the control of inflation. This is so since if inflation shocks contribute to interest rate variability in an IT era, then inflation expectations would prevent inflation from deviating much from the inflation target; this would imply that the central bank is less focused on inflation, not more! Consequently, it would clearly suggest “that the VAR evidence in the paper, tells us little about the impact of inflation targeting on the conduct of monetary policy” (Mishkin, *op. cit.*, p. 150).

Cecchetti and Ehrmann (1999) and Corbo et al (2001) also assess changes in central bank aversion to inflation, delivering mixed results. Cecchetti and Ehrmann (1999) find that, where an increase in central bank aversion to inflation is apparent, both for IT countries and non-IT countries, it is within the group of IT countries that it has increased the most. Among these cases UK is an exception, not registering significant changes in these magnitudes. Corbo et al. (2001) elaborate on these measures, discovering that inflation aversion increased among the non-industrialized countries, which applied IT, but the same cannot be said for the industrialized ones.

A different approach to dealing with the question of whether improved results in inflation are due to the way monetary policy responds to inflation, is to examine the official short-term interest rates. Following this line, Kahn and Parrish (1998) collect high and stable values for real official short-term interest rates, which are associated with tight monetary policies. In order to account for changes to policy due to incoming information, they estimate policy reaction functions, which regress the interest rate against several explanatory variables. Their results are mixed. On the one hand, they find structural breaks in New Zealand and the UK. The former presents a stronger reaction of official rates to lagged inflation and unemployment, and a weaker reaction to exchange rate. UK registers a loss in significance for the exchange rate, most likely reflecting the changing role of the exchange rate after the break away from the ERM. These results are, however, not clearly attributable to IT. On the other hand, Canada, Sweden and the US (the latter, considered as a benchmark) show no significant changes.

Neuman and von Hagen (2002) also estimate monetary policy reaction functions by estimating Taylor rules, incorporating a ‘smoothing’ variable for interest rates. Employing monthly data, they find substantial increases in the long-run response to inflation such that, during the post-IT period there is convergence to the Bundesbank and the Swiss National Bank long-run responses, thereby corroborating the findings of Cecchetti and Ehrmann (1999) and Corbo et al. (2001, 2002). They also find that less weight is put on stabilizing the cycle, with the exception of Sweden, which presented a more activist policy. The contribution of inflation shocks to the variance of interest rates is also computed using unrestricted VARs, confirming previous results. Neuman and von Hagen (2002) also apply an event-study analysis whereby they compare the performance of IT and non-IT central banks under similar exogenous shocks in both cases. They examine the increases in oil prices in the years 1978 and 1998. According to their evidence, actual and expected inflation responses to shocks improved more in IT countries. These gains in credibility allowed IT central banks to apply increases in short-run interest rates, which are similar to their IT counterparts. In comparison with the crisis starting in 1978, this represented a substantial improvement in the management of the 1998 oil price hike. Altogether, the authors conclude that the new IT regime has affected central bank behavior and credibility more than it has changed inflation outcomes, which improved for both groups.

Corbo et al. (2001), also find that the strength in the reaction of interest rate changes to both inflation and output shocks, decreased significantly among IT countries but these reductions were weaker or

non-existent among non-IT industrial countries. Ball and Sheridan (2003), instead, conclude that IT does not affect output growth or output variability, nor does it affect interest rates and their variability. A related study by Bodkin and Neder (2003), examines IT in the case of Canada for the period 1980-1989 and 1990-1999 (the IT period). Their results, based on graphical analysis, clearly indicate that inflation over the IT period did fall, but at a significant cost of unemployment and output. This result leads the authors to the conclusion that a great deal of doubt is cast “on the theoretical notion of the supposed long-run neutrality of money”, an important, if not the most important, ingredient of the theoretical IT framework. They also, suggest that the “deleterious real effects (higher unemployment and ..... lower growth) during the decade under study suggests that some small amount of inflation (say in the range of 3 to 5 percent) may well be beneficial for a modern economy” (p. 355). Pétursson (2004), however, shows that (unconditional) growth rates are sensibly higher in the year following IT adoption than the 5-year average of records previous to the IT. Output fluctuations are also shown to decline, in line with findings of Corbo (2001), Neumann and von Hagen (2002) and Truman (2003).

## 2.5 Evidence of IT impact on macro-economic variables

Cohen et al. (2003) consider the response of exchange rates (both nominal and real) to real and nominal shocks in order to assess IT benefits and sacrifices. They point out that IT regimes developed as a way of moving away from exchange rate targets. Increased flexibility in nominal exchange rates should, therefore, be considered as a benefit, since it would smooth out real shocks, acting as a type of shock absorber for the rest of the economy. In assessing the impact of IT they compare the effect that real shocks have on nominal exchange rates both after and before IT, and hypothesize a smaller impact as credibility is built. IT may, instead, imply a sacrifice if real exchange rates became more volatile with nominal shocks and purchasing power parity deviations being more severe. If IT regimes build up credibility, however, it is expected that nominal shocks would only have small and non-persistent effects on nominal exchange rates after IT, and hence real exchange rates would not be excessively affected. For *LITHCs* they produce evidence, which overwhelmingly supports a positive evaluation of IT strategy. First, sacrifice ratios expressed as percentage changes in nominal exchange rates due to nominal shocks, are negative in most countries except for Australia (where no difference is registered), and in Chile and Brazil, where positive sacrifice ratios are registered. Second, benefit ratios, defined as the increase in the percentage of real exchange rate explained by real shocks, increase in all *LITHCs*, but not for all cases examined. The benefit ratio is negative in the case of Israel, making the case for IT in general more dubious according to this criterion.

## 3. IT in emerging countries

Emerging countries have had varied experience in terms of targeting. A number of them over the recent past have been targeting the money supply or the exchange rate, especially the latter. Money supply targeting has been shown to be a rather unreliable means of controlling inflation in view of instabilities in the demand for money.<sup>7</sup> Changes in the exchange rate can be important in the case of emerging countries since such changes can have major effects on inflation. They can also produce acute vulnerability to currency crises since capital inflows can easily turn to capital outflows. A critical factor in this process is that since these countries have much of their debt denominated in

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<sup>7</sup> Although it is true to say, as in the text, that monetary targeting has been attempted in a number of emerging countries, Latin American countries have not used this strategy in a similar fashion, especially in the recent past. The main reason is the recognition of the serious possibility of instability in the demand for money as suggested in the text, a feature not merely of Latin American countries but other emerging and developed countries (Mishkin and Savastano, 2001). As the chapter that follows shows, Brazil has been no exception to this rule.

foreign currency, depreciation of the domestic currency increases the debt burden of domestic firms. Typically the assets of these countries are denominated in domestic currency, so that depreciation of the domestic currency results in serious decline in net worth of the country in question. The adverse effect on investment and economic activity are evident. This may suggest that central banks of the countries that fall within this category should target their exchange rates. This, of course, would go against one important pillar of IT, namely that of ‘absence of other nominal anchor’ (Mishkin and Schmidt-Hebbel, 2001). There is also the further difficulty that the impact of changes in the exchange rate on inflation depends on the nature of the exchange rate change – a pure portfolio shock increases inflation, while the effect of a real shock would depend on its nature, i.e. whether it is a demand or supply shock.<sup>8</sup>

Further arguments that suggest control of exchange rate targets by the central bank is limited have been proposed. The level of the exchange rate is ultimately determined by the international demand and supply of the domestic currency vis-à-vis that of the ‘anchor’ currency. So that shifts in sentiment about the domestic currency can trigger abrupt changes in its relative value that cannot be offset easily by central bank actions. Related to this reason is that speculative attacks can easily materialize, which may very well force an unintended parity change not necessarily based on economic fundamentals. Such controls can often be followed by financial and banking crises and debt defaults. Another reason is that monetary autonomy is lost in view of the delegation by the central bank of the country in question to another country, the ‘anchor’ country, of its monetary policy. Still another reason is that the burden of achieving the proper real exchange rate falls entirely on the level of domestic prices. This can be particularly costly when prices are sticky in which case it is output that must adjust first.

It may very well be that for these reasons that a number of emerging countries have switched to a form or another of inflation targeting as suggested in the introduction. The evidence so far on the experience of these countries with IT, FFIT or ITL, has not been as numerous and varied as in the case of the developed countries (Angeriz and Arestis, 2005a). Such evidence as there is suggests that IT is a success story in emerging countries (see, for example, IMF, 2005; Porter and Yao, 2005; Angeriz and Arestis, 2005b, however, produce different results). It is associated with a statistically significant larger reduction in the level and standard deviation of inflation as compared to other regimes. It also leads to a reduction in the level and volatility of inflation expectations. It is conceded, nonetheless, that such experience “comes against a backdrop of relatively subdued inflation worldwide”, and, indeed, it is still too early to generalize, for it remains to be ascertained how “inflation targeting [lite] regime will fare if global inflation rises significantly, although a formalization of the current regime may limit any erosion of the gains already achieved” (Porter and Yao, 2005, p. 18). Our own evidence of IT on emerging countries, though, suggests that non-IT central banks have also been successful in achieving and maintaining consistently low inflation rates (Angeriz and Arestis, 2005b). This evidence clearly implies that an emerging country central bank does not need to pursue an IT strategy to achieve and maintain low inflation.

A further comment on the experience of IT emerging countries is that whatever ‘success’ they may have had ought to be set against the background of the ‘preconditions’ that need to be met before IT adoption. IMF (2005) summarizes these pre-conditions as follows: technical capability of the central bank in implementing IT; an efficient institutional set up to motivate and support the commitment to

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<sup>8</sup> The arguments so far in this section are applicable in the case of asset prices, such as housing and stock prices. Bernanke and Gertler (1999) suggest that IT strategy should not target asset prices directly, but should utilize the information provided by movements in asset prices. In this way the possibility of asset price bubbles is less likely thereby promoting financial stability. Arestis and Karakitsos (2005) summarize the arguments against such a thesis and propose targeting of net wealth instead.

low inflation, including institutional independence; a healthy financial system; an economic structure characterised with fully deregulated prices; and absence of fiscal dominance. On current evidence, these preconditions admittedly do not prevail in most, if not all cases (IMF, 2005; but see Jonas and Mishkin, 2005, for a more neutral view on the importance of preconditions). Under such circumstances, the IT framework may be highly unsuitable for these countries. This argument clearly strengthens the finding of this chapter that whatever success we may attach to fighting inflation in the IT emerging countries, it cannot be due to this strategy. Other factors than IT must surely be responsible for the lower rates of inflation achieved by these countries. The opposite argument may also be true. Adoption of the IT strategy by these countries may lead to an improvement of the institutional ‘preconditions’. But the experience with the emerging IT countries is by far too short for an assessment of this hypothesis to be undertaken persuasively. Still the limited available evidence adduced from emerging countries, which have pursued ‘inflation targeting lite’ implies that “even in a country with solid institutions, a lack of fiscal dominance, and low external debt, it can take a long time before the central bank has earned sufficient credibility to anchor expectations for low inflation” (Porter and Yao, 2005, p. 18).

Two further problems, which are particularly relevant to Latin America, are worth exploring. These relate to the government-controlled prices and to the high incidence of pass-through from exchange rate fluctuations domestic prices. The first requires a high degree of co-ordination between the monetary and fiscal authorities on the timing and magnitude of changes in controlled prices. The second requires a great deal of vigilance by the monetary authorities in terms of exchange rate fluctuations; this aspect, though, is viewed as temporary, since as inflation is tamed it is thought that the degree of pass-through is weakened (Mishkin and Savastano, 2001). These aspects, and all the other alluded to in this section, indeed in the whole chapter, are important issues in the case of emerging countries and Brazil in particular. The chapter that follows vividly demonstrates this proposition, especially at the empirical level.

## 5. Summary and conclusions

We have attempted in this study to gauge empirical evidence for both developed and emerging countries that adopted the new monetary policy strategy that has come to be known as IT. It may very well be the case that IT countries, developed and emerging, have been successful in taming and controlling inflation. But then there is also evidence that clearly suggests that non-IT central banks have also been successful in achieving and maintaining consistently low inflation rates. Our overall conclusion, then, is that the available evidence we have managed to gauge clearly suggests that a central bank does not need to pursue an IT strategy to achieve and maintain low inflation. Indeed, and as Friedman (2004) suggests that acute focus on the IT strategy may very well lead to ‘the atrophication of concerns for real outcomes, especially so in an environment of supply-side shocks of the kind we are experience at this juncture with increasing energy prices’.<sup>9</sup>

The IT strategy, however, keeps evolving. Two recent developments, which are of paramount importance, are the following: the argument put forward by a number of policy makers (see, for example, King, 2005), which emphasizes the role of price expectations and the ability of central banks to influence them; and the prominent dimension of communication, especially in terms of the inflation forecasts reported by central banks, where “there has been a fair amount of change, at least for some central banks: the general trend is clearly towards reporting explicit forecasts over increasingly long horizons” (Kuttner, 2005, p. 18). These two areas in particular need to be

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<sup>9</sup> Interestingly enough, the evidence on supply-side shocks is that when central banks are confronted with them they do not over-react to above-target inflation when it is accompanied by slow economic growth (Kuttner, 2005, p. 37).

researched a great deal more, especially under the current economic conditions of serious supply-side shocks that central banks have to tackle in a ‘measured’, and sensible, way. Indeed, and for the purposes of this chapter and the one that follows, a key matter of concern is whether and the extent to which the issues raised in this book are applicable in the case of Latin American countries and Brazil in particular.

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