

# IMF Working Paper

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## Important Elements of Inflation Targeting for Emerging Economies

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**IMF Working Paper**

Monetary and Capital Markets Department

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**Abstract**

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This is the fifth chapter of a forthcoming monograph entitled "On Implementing Full-Fledged Inflation-Targeting Regimes: Saying What You Do and Doing What You Say." It examines whether certain conditions have to be met before emerging economies can adopt an inflation-targeting regime and provides some empirical evidence on the matter. The issues analyzed are the priority of inflation targeting over other goals, the absence of fiscal dominance, central bank independence, the degree of control over the policy interest rate, a sound methodology for forecasting, and the soundness of financial institutions and markets, and resilience to changes in exchange rates and interest rates.

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## I. Introduction

While a number of emerging economies had begun to use inflation targeting (IT) in the first half of the 1990s, it was initially only one part of their policy framework, with some variant of exchange rate targeting typically being equally or more important. It was only in the latter part of the 1990s and the first half of the current decade that IT became the central element in monetary policy arrangements of many emerging economies. The earliest literature on IT in emerging economies, which began to focus attention on differences between such countries and industrialized countries, also began to appear in the latter part of the 1990s.

A number of IMF publications, including Masson, Savastano, and Sharma (1997), Schaechter, Stone, and Zelmer (2000), Carare and others (2002), and Stone (2003), focused on the difficulties that would face emerging economies wanting to adopt IT. And they introduced the notion of the preconditions that needed to be satisfied before the introduction of IT. As the concepts of preconditions and conditions have played a relatively important role in the thinking about IT in emerging economies, this chapter focuses on both the earlier views on these issues and the current thinking that has developed, in part as a result of the experience of emerging economies with IT.<sup>2</sup>

It is now believed that while there are three conditions that are essential for the functioning of IT (priority of the inflation target as the objective of monetary policy, absence of fiscal dominance, instrument independence for the central bank), many of the apparent requirements suggested in the earlier literature are not really preconditions for the introduction of IT. Indeed, the direction of causation may well be from the introduction of IT to the satisfaction of such conditions rather than the reverse.

We then examine some of the empirical work on industrialized and emerging economies that has assessed whether having these conditions in place at the time of the adoption of IT has contributed to the subsequent successful functioning of IT in those countries that have chosen to adopt IT as their monetary policy framework.<sup>3</sup>

## II. Priority of Inflation Targeting Over Other Goals

Modern central banks typically have one instrument, the policy interest rate, and hence can have only one objective. Under IT, that objective is bringing the rate of inflation back to the target rate or keeping it near the target rate.<sup>4</sup> More precisely, the target of policy is the rate of

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<sup>2</sup>For empirical evidence on the success of IT regimes in both advanced and emerging-market economies, see Mishkin and Schmidt-Hebbel (2001), Truman (2003), Batini, Kuttner and Laxton (2005).

<sup>3</sup>An up-to-date overview of the conduct of monetary policy under IT can be found in Roger (2009). There may of course be further changes in the way monetary policy is conducted under IT in response to the recent crisis.

<sup>4</sup>See Freedman and Laxton (2009b) for a discussion of the reasons why the CPI is the measure of inflation used by IT central banks. The most important of these is that movements in the CPI represent changes in the cost of living. It is also essential for the credibility of the targeting framework that the measurement of the CPI is not

inflation at the end of the policy horizon, where the latter is defined as the period by which the central bank expects inflation to return to its target following the combination of a shock and the appropriate monetary policy response.

While the rate of inflation is the primary objective of policy, this does not mean that the central bank is indifferent to developments in other economic variables, the most important of which is the output gap. The response of the central bank to a shock to the economy will depend on such matters as the country's preference for inflation stability relative to output stability, the type of shock to which the central bank is reacting (demand or supply), whether the economy is already at its target rate of inflation or still in the process of disinflating, and the credibility of the central bank.

A more detailed discussion of some of these issues can be found in section 7 of Chapter 3 of this book (Freedman and Laxton, 2009b), which uses simulations of a small model with a loss function that has as arguments the deviation of inflation from target, the output gap, and the change in the policy interest rate. The conclusions from these and other simulations can be summarized briefly. First, increased weight on output stability implies a longer policy horizon and a weaker interest rate response to demand shocks. Second, the policy horizon will typically also be longer following a supply shock than a demand shock. Third, the policy horizon should generally be somewhat longer for countries that are disinflating when credibility is low than for countries that have been successful in anchoring long-term inflation expectations to the long-term target.<sup>5</sup>

Generally speaking, a relatively short policy horizon implies a commitment to achieving the target inflation rate fairly quickly following a shock, but with greater variability of output and financial variables. A relatively long horizon results in less volatility in output and financial market variables, but in inflation away from its target for a longer period of time following a shock. In both cases, however, the actions taken by the central bank must aim at bringing the rate of inflation back to its target over the specified time period. It is also worth noting that the optimal policy horizon will be affected by changes in the economic structure of the economy, including changes in the degree of nominal rigidities. Furthermore, since additional shocks are likely to hit the economy before it completely adjusts to the earlier shocks, policy will frequently have to be readjusted to take account of the new circumstances.

Moreover, as discussed in detail in Chapter 6 (Freedman, Laxton, Ötoker-Robe and Rose, 2010), targeting the rate of inflation does not mean ignoring movements in the exchange rate. The exchange rate plays an important role in the transmission mechanism for monetary policy, being one of the two main channels through which central bank actions affect aggregate demand and subsequently inflation. Consequently, in deciding upon the policy actions needed in given economic circumstances, the central bank must take account of

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subject to political manipulation.

<sup>5</sup>There could be some benefit in terms of central bank communications in using the inflation forecast to send an explicit signal as to how long it is expected that the rate of inflation will take to return to the target.

developments in the foreign exchange rate, since they influence inflation both directly through their effect on traded goods prices, and indirectly through their effect on aggregate demand. In addition, when the exchange rate moves for reasons other than central bank policy actions, the central bank must come to a view as to the likely cause of the exchange rate movement before deciding upon the appropriate policy response. In particular, the crucial question is whether the exchange rate movement is a result of expected “real” developments that would also impact aggregate demand and inflation, or “financial” developments, such as increased market confidence resulting from an improvement in the political situation of the country.

A number of emerging economies have chosen to have targets for both inflation and the exchange rate, especially in the initial period after the adoption of IT.<sup>6</sup> This has a number of disadvantages. It can leave the public and the financial markets unclear as to which target will dominate when the two are in conflict. And the central bank will be unable to communicate nearly as clearly the way in which policy will be conducted as it could in a full-fledged IT environment with a single target. As a result, the central bank will lose many of the benefits that arise from anchoring the public’s inflation expectations to the inflation target. In a number of cases, for example Chile and Israel, countries that began with both an inflation target and an exchange rate target gradually reduced the importance of the exchange rate target, eventually abandoning it altogether. In sum, attempting to operate a system with more than one target tends to have many disadvantages and relatively few advantages.

### **III. Absence of Fiscal Dominance**

Another factor that has received considerable attention in the literature on IT in emerging economies is the presence or absence of fiscal dominance. If the central bank is required to finance the government deficit by lending directly to the government or by purchasing all new issues of government bonds that the public is unwilling to purchase, it will not also be able to target the pre-announced rate of inflation. That is, if the central bank tries to use its single policy instrument to aim at two goals, one involving financing the government deficit and the other being the achievement of an inflation target, it will simply not be able to succeed in achieving both goals with the one instrument. Put more technically, if the central bank has to finance the government deficit, it will not have control over the size of its own balance sheet. Hence, it will not be able to exert a sufficient degree of influence over the policy interest rate to set in motion the effects on the transmission mechanism needed to respond to an overly high or overly low rate of inflation.<sup>7</sup> Some emerging economies have dealt with this potential

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<sup>6</sup>To overcome the problem of one instrument and two goals in situations of conflict between the two targets, the central bank could give priority to one of the goals, or it could decide on a trade-off between the two targets and therefore not achieve either of the goals, or it could attempt to use sterilized intervention in the foreign exchange market as a second instrument. There is considerable doubt in the literature as to the effectiveness of sterilized intervention when countries have open capital markets.

<sup>7</sup>Central banks could achieve more than one goal if they had recourse to more than one instrument. For example, suppose that the central bank had the power to change primary reserve requirements on the liabilities of commercial banks and that it raised these requirements when it needed to purchase a new issue of government debt. Or, alternatively, suppose that the central bank could impose a secondary reserve requirement on commercial

problem by prohibiting direct financing of government deficits by the central bank.

Another use of the term fiscal dominance, which has been applied by some commentators to the situation in Turkey and Brazil, relates not to the requirement that the central bank finance the government deficit, but rather to the linkage between the interest rate actions that the central bank needs to engage in to achieve its inflation target and the perceptions in financial markets of the ability of the government to pay its obligations—see Blanchard (2005) and Favero and Giavazzi (2005).

Consider a positive demand shock with potential inflationary consequences that requires an interest rate increase by the central bank. Given the short-term nature of public debt in many emerging economies, this could lead to increased concern in financial markets about debt sustainability and, hence, to an increase in the risk premium on the country's debt. This in turn could lead to a depreciation of the currency (rather than the appreciation normally associated with a rise in the policy interest rate), which would tend to put upward pressure on inflation, both directly and indirectly. Thus, the response by the central bank to an inflationary shock could in theory lead to an economic outcome that reinforced inflationary pressures, rather than the reverse. It is not clear how important this problem is at present in emerging economies. But it would appear that the introduction of IT should be helpful in breaking the linkages sketched out above, since the effect of a depreciation on inflation is likely to be much attenuated in an IT framework. Also, statements by the government reaffirming its commitment to a sustainable fiscal policy would be helpful in breaking the potential links between the interest rate movement and the risk premium.

Some commentators have gone further than the above view that absence of fiscal dominance is essential for inflation targeting and have argued that, even in the absence of fiscal dominance, a country should have a sound fiscal policy before it adopts IT. In fact, fiscal weakness is a problem in all monetary policy frameworks and there is no reason to believe that it would cause more difficulty under IT than under other frameworks. Interestingly, in a number of industrialized countries, including Canada, the adoption of IT preceded the improvement of the government fiscal position. There is nonetheless no question that a weak fiscal position makes the job of a central bank harder under IT as well as in other policy frameworks.

There are two cases that need to be distinguished. In the first case, the combination of a disinflationary monetary policy and an overly easy fiscal policy results in high real interest rates and a high real exchange rate but the rate of inflation does decline. For example, in the United States in the early 1980s, the easy fiscal policy of the Reagan administration was at cross purposes with the Federal Reserve's monetary policy that was aiming at a sharp disinflation. The outcome was an appreciable disinflation, but it was accompanied by high real

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banks, which the latter could satisfy only by holding government debt. Then the central bank could use the interest rate instrument to influence aggregate demand and the rate of inflation, and adjust reserve requirements to satisfy the goal of financing government deficits. However, such arrangements would lead to highly variable reserve requirements, and would result in a significant deterioration in the efficiency of commercial banks and therefore in the mechanisms for the accumulation of savings and the intermediation between savings and investment in the economy.

interest rates and a high real exchange rate, making the entire process much more difficult and uncomfortable than would have been the case if fiscal policy had supported monetary policy. Similarly, the high real interest rates in Canada relative to those in the United States in the first half of the 1990s can be attributed in considerable measure to the absence of fiscal credibility. Nonetheless, the Bank of Canada succeeded in bringing about a low rate of the inflation.

In the second case, the combination of a disinflationary monetary policy and an overly easy fiscal policy results in an increase in the rate of inflation. This occurs in large part because the weak fiscal position raises concerns in financial markets about the possibility of future monetization. This situation is most likely to arise in emerging economies that have a history of very high inflation and/or hyperinflation, and that also have less well developed capital markets for financing government deficits, where the fear of monetization would be much greater than in industrialized countries.

Effectively, what distinguishes the two cases is the perception of the markets and the public as to whether fiscal policy is sustainable in the long run or not. If it is believed to be sustainable, the poor fiscal policy will result in less than ideal outcomes in which the combination of fiscal and monetary policies leads to high real interest rates and a high real exchange rate but nonetheless inflation falls. In contrast, if it is believed that the fiscal policy is unsustainable in the long run, the markets will expect future monetization of fiscal deficits, and the disinflationary monetary policy will not be able to overcome the effects on expected inflation of the overly easy fiscal policy and therefore will be unable to bring inflation under control.

#### **IV. Central Bank Independence**

Another condition that is often noted in the literature is the need for central bank independence. It is generally agreed that this involves instrument independence, the freedom to set the policy interest rate needed to achieve the desired goal of policy without government interference, rather than goal independence, the freedom to choose the objective of policy. Indeed, goal independence for the central bank, i.e., the freedom to set the actual quantitative target for inflation, is not required and may not even be desirable.

Given the importance of instrument independence for the central bank, many IT countries have passed legislation giving the central bank the authority to set interest rates. This is particularly important in emerging economies, since in many cases their history is one of the government controlling monetary policy. Direct government control over monetary policy actions has typically resulted in poor monetary policy outcomes, with a strong tendency to high rates of inflation and the use of monetary policy for political goals. By tying their own hands through legislation, governments are able to increase the likelihood of competent monetary policy, to reassure financial markets that policy is likely to be much less inflationary than in the past, and to allow the central bank to build up its credibility, with attendant benefits.<sup>8</sup>

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<sup>8</sup>The arrangements governing monetary policy in the United Kingdom during the period between 1992 and 1997 did not satisfy this perceived need for instrument independence for the central bank. And the immediate

In this context, it is important to note that, while the central bank should be given instrument independence, the government of an emerging economy should be involved in decision making regarding the quantitative target of policy and, equally important, be publicly committed to its achievement. Otherwise, there could be continuing uncertainty on the part of economic participants, including investors, as to whether the government really supports the IT framework and the inflation target. The best way of committing the government to such a policy would be for it to revise the legislation governing the central bank so that low inflation or price stability is established as the primary goal of monetary policy. The experience of industrialized countries shows that inflation targeting can work with the government setting the target itself, or, perhaps better, with the target jointly set by the government and the central bank.

### **V. A Considerable Degree of Control Over the Policy Instrument**

In addition to formal instrument independence, the central bank should have the ability to control or strongly influence a policy interest rate (or possibly some other mechanism in the case in emerging economies) that affects the interest rates feeding into aggregate demand. This means that mechanisms must exist or be established to enable the central bank to initiate a series of developments flowing from its own actions all the way to changes in aggregate demand and inflation. In technical terms, the central bank stands at the beginning of the transmission mechanism of monetary policy, and its actions result in changes in a series of economic variables that constitute the linkages from its actions to the rate of inflation.

Typically, in countries with a reasonable degree of financial development, the central bank's actions first influence money market rates and then spread to interest rates further out on the maturity spectrum as well as to the exchange rate. In countries without developed financial markets, some mechanism has to be developed by which the central bank's actions affect the interest rates charged by banks on loans and mortgages and (less importantly) the interest rates paid by banks on deposits, and/or influence the exchange rate. In general, the central bank will have to aim at understanding why the transmission mechanism from the official rate to other rates is not functioning well (e.g., monopolistic/oligopolistic banking sector, a segmented money market, a dollarized or euroized financial system that reacts mainly to foreign interest rates rather than domestic official rates) and at addressing these weaknesses in the transmission mechanism. Where the main transmission channel is the exchange rate, the central bank will have to rely on affecting the rest of the economy through the exchange rate and will need to have a basic understanding of the way in which its actions influence the value of the exchange rate.

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favorable response of financial market expectations to the granting of instrument independence to the Bank of England in 1997 indicates the benefits of such a move. Moreover, to the extent that government conduct of monetary policy in emerging economies has resulted in poor outcomes, the benefits from granting instrument independence to central banks in such economies would be even greater than in industrialized countries.

## VI. Reasonable Methodology for Forecasting

Some commentators have argued that it is important for the central bank to have a reasonable methodology, including a model, for producing inflation forecasts. This has sometimes been interpreted as a requirement for the central bank to have a clear understanding of the transmission mechanism for the country. Since, in many cases, emerging economies have just undergone or are undergoing major changes in their economic framework, the ability of the central bank to have a good empirical model of the transmission mechanism is very limited.

Indeed, the understanding of the transmission mechanism in industrialized countries (where central banks and academics have been studying this issue for decades) is still imperfect, in part because of the inherently complex nature of the transmission mechanism, in part because of changes over time as the economic and financial systems of the country evolve. The challenges to modeling the transmission mechanism are even greater in emerging economies as their economic and financial structures change in the course of becoming more market oriented. Also, in those emerging economies that are highly dollarized, the nature of the transmission mechanism can be significantly influenced by the reaction to exchange rate movements of those entities whose balance sheets have a foreign currency mismatch.

While a sophisticated methodology for producing forecasts can be developed and improved over time, it is not essential at the outset of IT. What is essential for an IT country is a reasonable framework for forecasting the future rate of inflation. The model underlying this framework can initially be rather simple, becoming more complex and realistic gradually over time. The framework should employ whatever formal empirical relationships have proved useful in the past, whatever variables and indicators containing information on the future rate of inflation are available, survey evidence, and the judgment of the staff and the members of the monetary policy committee (MPC) of the central bank. That is, it should not be based solely on an econometric model, but rather should incorporate the judgment of specialists and whatever else is available that can contribute to the quality of the forecast.<sup>9</sup>

If a model plays an important role in the production of the inflation forecast, it is essential to embed in its reaction function the appropriate response of the central bank to pressures on inflation. That is, the central bank should raise or lower the nominal policy interest rate more than one-to-one in response to a change in the forecast rate of inflation relative to the target rate. If the interest rate response were less than one-to-one, a positive inflation shock would result in a decline in the real rate of interest, which would intensify the inflationary pressures in the economy rather than counteract them. Similarly, in the case of a negative inflation shock, an insufficient decline in the nominal rate of interest would result in an increase in the real rate of interest, which would accentuate the disinflationary or deflationary pressures.<sup>10</sup>

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<sup>9</sup>See Chapter 7 (Laxton, Rose and Scott, 2010) for a detailed account of the frameworks used in IT countries for forecasting inflation and other key economic variables.

<sup>10</sup>This issue was discussed in Chapter 2 (Freedman and Laxton, 2009a). It was first emphasized in Taylor (1993) and has come to be known as the Taylor principle.

## **VII. Sound Financial Institutions and Markets and Resilience to Changes in Exchange Rates and Interest Rates**

It is sometimes argued that a condition for the introduction of IT is that the economy needs to be resilient to changes in exchange rates and interest rates. This involves a number of elements. Perhaps the most important one is that financial institutions be sound and well regulated and supervised. Otherwise, it is argued, the central bank will be constrained in its ability to raise interest rates by the fear that such an action would result in distress on financial institutions. A similar concern relates to the possibility that a sharp depreciation in the external value of the currency would affect the balance sheets of financial institutions or their customers negatively and would lead to significant losses associated with a deterioration in banks' asset quality.

While it is always better that monetary policy be conducted in an environment of sound financial institutions and markets, it is not clear that IT imposes a significantly higher bar in this respect than other frameworks for monetary policy. Although using the exchange rate as a nominal anchor seems to be less demanding in this respect, the periodic sharp devaluations in an adjustable peg system (following episodes of capital flight, for example) can have deleterious effects on the balance sheet of financial institutions and/or corporations and even result in their failures. This is particularly likely in the context of a system that gives unwarranted comfort to participants as to the permanence of the exchange rate fixity and therefore results in their not protecting themselves against exchange rate changes. One of the advantages of conducting monetary policy under IT in conjunction with a floating exchange rate regime is that it leads economic participants to recognize that there is two-way risk in exchange markets, and IT is therefore much more likely to lead to the development and use of hedging facilities than a fixed exchange rate regime and to create incentives for reducing foreign-currency mismatches on balance sheets.

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Let us now examine more closely the argument that emerging economies are more sensitive to exchange rate movements than are industrialized economies, since this is an important element in the concern of some emerging economies about the adoption of inflation targets.<sup>11</sup>

Why are exchange rate movements perceived to be more of a problem for emerging economies than for industrialized economies? First, the pass through from exchange rate

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<sup>11</sup>Chapter 6 (Freedman, Laxton, Ötler-Robe and Rose, 2010) is devoted to a much more complete discussion of the role of the exchange rate in an IT regime. See also Stone and others (2009) and Roger and others (2009).

movements to price movements is greater in emerging economies than in industrialized economies. In part, this is due to the relatively large share of exports and imports in GDP in emerging economies and the high proportion of consumer goods imported in such countries (which enter directly into the CPI). It is also partly due to the history of high rates of inflation in many emerging economies and the associated high level of indexing, including in some cases indexing directly to the exchange rate. Thus, central banks in some countries (e.g., Mexico) were loath to adopt full-fledged IT because of their concern that they would not be able to achieve a pre-announced inflation target in the face of an exchange rate depreciation, and would lose credibility as a result.

One response to this concern is to note that in countries that have achieved lower rates of inflation, the pass through seems to have declined—see Baqueiro and others (2003). Of course, this usually happens gradually over time. Thus, the importance of this problem should diminish as a result of the commitment to, and achievement of, a lower rate of inflation.

The second concern with exchange rate movements derives from the mismatch in many countries between assets and liabilities denominated in a foreign currency, and the consequent vulnerability of these countries to an exchange rate depreciation. In some countries, the banks themselves have a net foreign-currency liability position. In others, the banks have a balanced position, but their customers have more foreign-currency liabilities than foreign-currency assets. A sharp depreciation could cause the domestic currency value of corporate liabilities denominated in foreign currencies to increase significantly and, hence, lead corporations to default on their bank loans. Thus, in circumstances of balance sheet mismatch, the banks are vulnerable to a sharp depreciation directly or indirectly.

This situation, which is linked to the absence of long-term domestic currency financial instruments because of a history of high rates of inflation, has been termed “original sin”—see Eichengreen and Hausmann (1999). But, as the experience of Chile and some other countries indicates, success in achieving low inflation and the encouragement by the authorities of the development of local currency bond markets can overcome this so-called original sin. However, this does take time. And, in the meantime, emerging market countries may be concerned that an exchange rate depreciation could have negative effects on the economy.

The third concern relates to the desire of these countries to protect their export (and import-competing) industries. If exchange rates move excessively and in ways not consistent with economic fundamentals, it can have unfavorable effects on the traded goods sector, as companies come under pressure from a temporary appreciation of the currency, or become overly profitable and expand inappropriately in response to a temporary depreciation. In the absence of hedging instruments, producers are unable to protect themselves against exchange rate movements. And some countries are especially concerned that exchange rates will move excessively because of the lack of liquidity of their financial markets.

All this has led to a “fear of floating”—see Calvo and Reinhart (2002) in which ostensible floaters intervene very heavily in practice, especially on the up side. However, if an inflation targeting country tries to tie down its exchange rate too rigidly, the attempt to prevent the

currency from moving in response to shocks can be inconsistent with its commitment to the inflation target as well as making it more difficult for the real exchange rate to move to its new equilibrium.

A number of commentators, such as Goldstein (2002), have suggested that middle income emerging market economies adopt inflation targets but remain more sensitive to exchange rate movements than their industrialized counterparts. What this seems to involve is a commitment to the following: the primacy of the inflation target; no alternative target in the form of an exchange rate band or crawling peg; a readiness to intervene in foreign exchange markets to smooth exchange rate movements because of the thinness of the markets in emerging economies, but not to prevent movements to a new equilibrium exchange rate in response to real shocks; and a willingness to use the interest rate instrument to influence exchange rates on the margin in much the same way as intervention is used (i.e., to smooth exchange rate movements in response to portfolio shocks but not in response to real shocks that require an adjustment to a new equilibrium real exchange rate).

Goldstein's approach combines the fundamental role of inflation targeting with a strong commitment to improving the financial system and a secondary role for exchange rate smoothing. It may prove attractive to some emerging economies considering the adoption of IT. What is essential in conducting policy in this way is to ensure that the actions of the central bank are clearly in line with the primacy of the inflation target and that any policy actions to smooth exchange rates are seen to be secondary to the goal of achieving the pre-announced rate of inflation. This ordering of priorities will require self-discipline on the part of the authorities. Otherwise, there will be a risk of not achieving the announced target rate of inflation as well as serious communications problems regarding the thrust of policy, and many of the benefits of inflation targeting will be lost. Moreover, it is often difficult in practice to distinguish between simple exchange rate volatility and movements in the exchange rate that result from changes in fundamental economic factors. While smoothing may be appropriate for the former case, it could slow the movement to the new equilibrium inappropriately in the latter case.

### **VIII. Some Empirical Evidence**

There has been some recent empirical evidence on whether the various conditions in the literature need to be satisfied before adopting IT, and whether not satisfying them initially implies a less good performance subsequently. Batini, Kuttner and Laxton (2005) assesses the situation in 21 IT countries and 10 non-IT countries based on responses to a questionnaire completed by the central bank in those countries. It uses a somewhat different categorization of conditions than that used earlier in this chapter. The study examines four sets of conditions – technical infrastructure, financial system health, institutional independence, and economic structure.

Technical infrastructure includes data availability, systematic forecasting capabilities, and the availability of models capable of conditional forecasts. The health of the financial system includes six indicators benchmarked to the United Kingdom financial system – regulatory

capital as a percentage of risk-weighted assets; stock market capitalization; depth of the private bond market; stock market turnover; currency mismatch at domestically owned banks; and maturity of actively traded bonds. Institutional independence comprises seven indicators – absence of fiscal obligation to finance government budget deficits; full operational or instrument independence; whether the legal mandate was inflation focused; the governor’s job security; favorable fiscal balance; low public debt; and an overall measure of central bank independence developed in an earlier IMF working paper by Arnone and others (2006). The four indicators of economic structure are intended to capture a variety of economic conditions that are often thought to affect the likelihood of success of IT—low exchange rate pass through; low sensitivity to commodity prices; extent of dollarization; and extent of trade openness.

Table 1 presents measures for the sets of conditions and for each of the indicators for emerging market IT economies as a group before the adoption of IT and the current situation at the time the paper was written, and, by way of comparison, for non-IT emerging markets as a group before they adopted their current regime and the current situation at the time the paper was written. Table 2 does the same for the IT emerging markets as a group and for the IT industrial countries as a group. Figure 1 presents the same information for the overall sets of conditions by individual countries at the time of the adoption of IT.

The Batini, Kuttner and Laxton (2005) study comes to the conclusion that no IT country had all the elements fully in place prior to IT adoption, that industrialized country ITers fared better than emerging market ITers in satisfying the conditions prior to the adoption of IT, that none of these factors makes a significant difference in explaining the improvement in macroeconomic performance between pre and post IT adoption, and that the adoption of IT has been associated with rapid improvements in institutional and technical structures. Indeed, causality may run in the other direction, from the adoption of IT to economic and financial restructuring. It also concludes that, in terms of institutional, technical and economic characteristics, “the gap between inflation targeters (at the time of adoption) and potential emerging market inflation-targeting adopters today is relatively small, suggesting that these factors should not stand in the way of the successful adoption of inflation targeting in these countries.”

In fact, as discussed in Chapter 10 (Freedman, and Ötoker-Robe, 2009), detailed country experiences show that it is not essential to satisfy all the so-called prerequisites before introducing IT. No country in this group of countries satisfied all the preconditions at the time of IT adoption, and they all made considerable progress in establishing some of the various elements that are helpful in conducting policy under IT subsequent to adoption.

Table 1: Emerging-Market Preconditions and Current Conditions (1 = Current Best Practice)

	IT Emerging markets		Non-IT Emerging markets
	Pre-adoption	Current	Pre-adoption of current regime
<b>Technical Infrastructure</b>	<b>0.29</b>	<b>0.97</b>	<b>0.51</b>
Data availability	0.63	0.92	0.65
Systematic forecast process	0.10	1.00	0.60
Models capable of conditional forecast	0.13	1.00	0.28
<b>Financial system health</b>	<b>0.41</b>	<b>0.48</b>	<b>0.40</b>
Bank regulatory capital to risk-weighted assets	0.75	1.00	0.71
Stock market capitalization to GDP	0.16	0.21	0.16
Private bond market capitalization to GDP	0.10	0.07	0.29
Stock market turnover ratio	0.29	0.22	0.37
Currency mismatch	0.92	0.96	0.67
Maturity of bonds	0.23	0.43	0.18
<b>Institutional independence</b>	<b>0.59</b>	<b>0.72</b>	<b>0.49</b>
Fiscal obligation	0.77	1.00	0.50
Operational independence	0.81	0.96	0.70
Central bank legal mandate	0.50	0.62	0.40
Governor's job security	0.85	0.85	0.80
Fiscal balance in percent of GDP	0.48	0.47	0.38
Public debt in percent of GDP	0.47	0.47	0.35
Central bank independence	0.26	0.64	0.32
<b>Economic structure</b>	<b>0.36</b>	<b>0.46</b>	<b>0.55</b>
Exchange rate pass-through	0.23	0.44	0.33
Sensitivity to commodity prices	0.35	0.42	0.67
Extent of dollarization	0.69	0.75	0.63
Trade openness	0.18	0.21	0.56

Source: Batini, Kuttner and Laxton (2005).

Table 2: Preconditions and Current Conditions in Emerging-Market and Industrial Countries  
(1 = Current Best Practice)

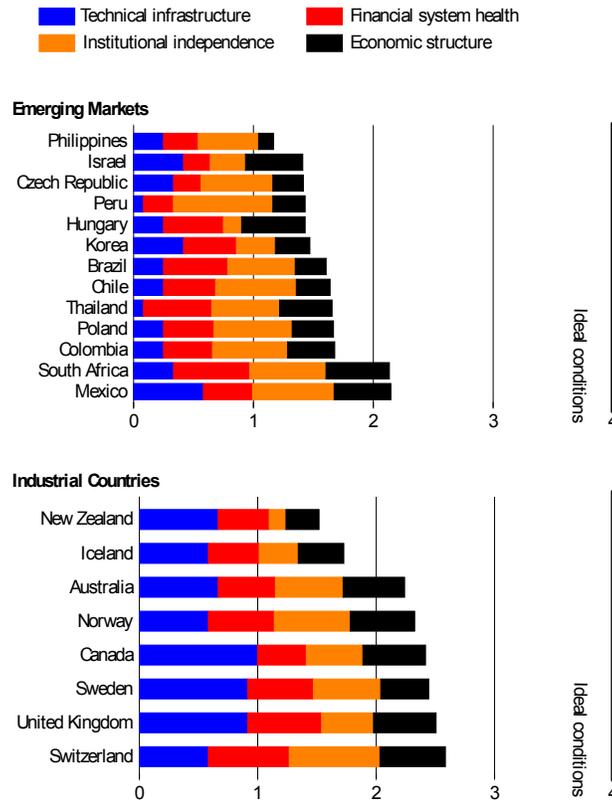
	Emerging markets		Industrial countries	
	Pre-adoption	Current	Pre-adoption	Current
<b>Technical Infrastructure</b>	<b>0.29</b>	<b>0.97</b>	<b>0.74</b>	<b>0.98</b>
Data availability	0.63	0.92	0.84	0.94
Systematic forecast process	0.10	1.00	1.00	1.00
Models capable of conditional forecast	0.13	1.00	0.38	1.00
<b>Financial system health</b>	<b>0.41</b>	<b>0.48</b>	<b>0.53</b>	<b>0.60</b>
Bank regulatory capital to risk-weighted assets	0.75	1.00	0.75	1.00
Stock market capitalization to GDP	0.16	0.21	0.28	0.44
Private bond market capitalization to GDP	0.10	0.07	0.40	0.31
Stock market turnover ratio	0.29	0.22	0.28	0.35
Currency mismatch	0.92	0.96	1.00	1.00
Maturity of bonds	0.23	0.43	0.46	0.52
<b>Institutional independence</b>	<b>0.59</b>	<b>0.72</b>	<b>0.56</b>	<b>0.78</b>
Fiscal obligation	0.77	1.00	0.75	1.00
Operational independence	0.81	0.96	0.63	1.00
Central bank legal mandate	0.50	0.62	0.16	0.44
Governor's job security	0.85	0.85	1.00	1.00
Fiscal balance in percent of GDP	0.48	0.47	0.45	0.78
Public debt in percent of GDP	0.47	0.47	0.53	0.54
Central bank independence	0.26	0.64	0.44	0.72
<b>Economic structure</b>	<b>0.36</b>	<b>0.46</b>	<b>0.47</b>	<b>0.55</b>
Exchange rate pass-through	0.23	0.44	0.31	0.50
Sensitivity to commodity prices	0.35	0.42	0.44	0.56
Extent of dollarization	0.69	0.75	1.00	1.00
Trade openness	0.18	0.21	0.13	0.16

Source: Batini, Kuttner and Laxton (2005).

### Figure 1. Initial Conditions When Countries Adopt Inflation Targeting

(For each of the four categories of initial condition 0=poor, 1=ideal)

Most of the inflation targeters had poor initial conditions prior to the adoption of inflation targeting.



Source: IMF staff calculations.

## IX. Summary

While there are some conditions that should be met before inflation targeting is adopted in emerging economies (priority of the inflation target as the objective of monetary policy, absence of fiscal dominance, instrument independence for the central bank), most of the other conditions and elements that have been proposed as essential to the IT framework can be introduced subsequent to the adoption of IT. The latter include construction of formal models for forecasting inflation, sophisticated empirical research on the transmission mechanism, issuing monetary policy reports or inflation reports, structural changes to reduce indexation, and strengthening the financial system by improving the regulation and supervision of financial institutions and encouraging the development of long-term domestic currency bond markets. Even if the economic and institutional environment in emerging economies is not absolutely ideal at the outset, the benefits from adopting IT and then improving the environment would be substantial. And this was certainly the experience in the industrialized economies and in the emerging economies that have adopted IT.

## **Appendix: Background and Brief Summary of the Book On Implementing Full-Fledged Inflation Targeting Regimes: Saying What You Do and Doing What You Say**

### **Background Information:**

The book grew out of a series of inflation-targeting (IT) and macro-modeling workshops that were designed to introduce central bankers and IMF staff members to the subject. The workshops covered many of the practical aspects of IT and were taught by several lecturers who had considerable central-banking experience either working under an IT regime or helping other central banks set up an IT regime. They also provided an opportunity for central banks at different stages of implementing IT regimes to share their experiences. The external workshops were organized on a regional basis and included Mexico (2001), Finland (2001), Turkey (2002), Finland (2003), Ukraine (2004), Turkey (2005), Thailand (2006) and Morocco (2007). The internal workshops were organized by the IMF Institute each year since 2006. The external workshops were all sponsored in part by the host central bank and organized by staff in the Fund's Research Department and Monetary and Capital Markets Department.

The editors and authors would like to thank a large number of people for contributing to the workshops and the material that is presented in the book. In particular, we owe a great debt to a few IT central banks that willingly gave us access to some of their most talented people. This list includes Tore Anders Husebø (formerly Norges Bank), Jaromir Benes (formerly Czech National Bank and Reserve Bank of New Zealand and currently IMF), Aaron Drew (Reserve Bank of New Zealand), David Hargreaves (Reserve Bank of New Zealand), Jaromir Hurnik (Czech National Bank), Ondra Kamenik (Czech National Bank and IMF), Tiff Macklem (formerly Bank of Canada), Øistein Røisland (Norges Bank), David Rose (formerly Bank of Canada), Alasdair Scott (formerly Reserve Bank of New Zealand and Bank of England, currently IMF), Kristen Solberg-Johansen (Norges Bank), David Vavra (formerly Czech National Bank, currently IMF) and Jan Vlcek (Czech National Bank). As well, we would like to thank Andy Berg, Philippe Karam, Michael Kumhof and Papa N'Diaye of the IMF for their contribution to the workshops.

### **Brief Summary of the Chapters:**

Chapter 2. Why Inflation Targeting? Freedman and Laxton (2009a) contains background considerations on why central banks have chosen low inflation as their policy goal and why so many countries have chosen inflation targeting as a framework for achieving that goal.

Chapter 3. Inflation Targeting Parameters: Freedman and Laxton (2009b) discusses design parameters—(i) the definition of target variable; (ii) the potential role of core inflation measures; (iii) the advantages and disadvantages of point targets, point targets with a band, and range targets; (iv) the choice of the long-run target inflation rate; (v) the target horizon; and (vi) the loss function and policy horizon.

Chapter 4. Inflation Targeting Pillars: Transparency and Accountability: Freedman and Laxton (2009c) discusses issues related to transparency, communications, and accountability.

Chapter 5. Important Elements of Inflation Targeting for Emerging Economies: Freedman and Ötoker-Robe (2010) discusses important elements in implementing an IT framework in emerging economies.

Chapter 6. Role of the Exchange Rate Under Inflation Targeting: Freedman, Laxton, Ötoker-Robe and Rose (2010) discusses the role of the exchange rate in an IT regime.

Chapter 7. Forecasting and Policy Analysis System: Laxton, Rose and Scott (2010) sets out the process for developing a structured forecasting and policy analysis system.

Chapter 8. Research and Advanced Macro Modeling: Laxton, Rose and Schmidt-Hebbel (2010) examine the role of research and DSGE modeling under IT.

Chapter 9. Modeling at the Central Bank of Chile: Schmidt-Hebbel (2010) discusses the experiences with modeling at the Central Bank of Chile.

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