Monetary Policy
Effect on Inflation and Growth

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Abstract: This paper examines the evolution of the objectives of monetary policy and how after a detour it has returned to the control of inflation as it was under the Gold Standard (GS). But whereas it was geared to external conditions during the GS, it has moved full circle and should now be geared towards maintaining internal balance. India started experimenting with different frameworks for monetary policy once it became clear that monetisation of the budget deficit had a significant influence on the rate of inflation. It has finally settled on inflation targeting. Our preliminary findings from a panel of developing countries that have adopted inflation targeting shows that adoption of inflation targeting reduces inflation, raises growth rates and reduces external debt. However, IT has not always been successful in reducing inflation to the target range. Furthermore, before the oil price rise of 1973 these economies grew at considerably higher rates though this was accompanied by faster inflation. The lower inflation may be at the cost of slower growth.

Keywords:

I: Introduction

In this commentary we deal with the objectives of monetary policy and not its operating rules. The usual set of objectives from which a central bank chooses are inflation, the state of the balance of payments or the behaviour of the exchange rate, output or output growth, and unemployment. However, in an increasing number of countries the sole objective for monetary policy is to control inflation. Central banks announce a target inflation rate that they seek to achieve. Recently, the Reserve Bank of India (RBI) also adopted inflation targeting as the framework for the conduct of its monetary policy. This has been a

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controversial step as many analysts argue that inflation targeting is not appropriate for India. In this commentary we study how the objectives of monetary policy have changed over the years and why countries are adopting the framework of inflation targeting. We finally examine whether inflation targeting is appropriate for India.

In Section II we study the objective of monetary policy in different periods. We distinguish the following periods, the gold standard (GS), immediate aftermath of the Second World War (SWW) and later in the 1950s and 1960s when central banks used monetary policy to control inflation. The objective of monetary policy for many years during the operation of the gold standard (GS), especially before the First World War, was to maintain a stable exchange rate which entailed controlling the rate of inflation which in turn required control of the government's budget deficit. In the immediate aftermath of the Second World War to lower the cost of servicing the large government debt inherited from the SWW, central banks kept interest rates low. It was only gradually as the rate of inflation picked up that monetary policy was geared to reduce the rate of inflation. The stagflation of the 1970s proved to be a challenge to central banks. We next examine how central banks reacted to this challenge. In Section III we note that monetary theory came to increasingly see the role of central banks in anchoring expectations as that would provide a stable environment for investors. It was in this context that central banks came to adopt inflation targeting. In Section IV we study the evolution of policy by the RBI and why finally it adopted inflation targeting. In section V we study what has been the outcome of the RBI adoption of inflation targeting. In Section VI we analyse more generally from a sample of developing countries whether adoption of IT has resulted in lower inflation, and higher growth. We end with some broad conclusions in Section VII.

II: Evolution of Monetary Policy

Monetary Policy during the Gold Standard

During the period of the gold standard (GS) the use and effectiveness of monetary policy differed between the core countries whose currencies were used as reserve money and the periphery countries. In both sets of countries monetary policy was used to manage the balance of payments (BOP) so that the exchange rate could be kept stable, though the channel of action differed. In the core countries, particularly England, which exported capital, the rate of interest was raised when the BOP was in deficit. This reduced outflow of capital and induced inflow so that the capital account improved. The higher interest rate also reduced the current account deficit because of a lower level of economic activity. Movements in both the current and capital accounts helped maintain BOP equilibrium. In the periphery countries the higher rate of interest reduced the level of economic activity and so imports and this reduced the BOP deficit. The rate of interest changes acted mainly through the current account in the periphery countries and through the capital account in the core countries. In modern language, monetary policy was used to maintain external balance and governments did not bother about internal balance.

Monetary Policy after the Second World War till the increase in oil prices in 1973

Rediscovery of the role of monetary policy

A major preoccupation of central banks after the Second World War was to keep interest rates low so that servicing the large government debt inherited from the war would be easier. Also governments were more concerned with maintaining the level of economic activity to avoid the high levels of unemployment that had prevailed in Europe after the First World War. But cheap money together with government expenditures to repair the war damage in many European countries raised the rate of inflation and central banks were finally forced to raise interest rates to check the inflation.

The assignment problem: the role of monetary policy

Policy makers after the war were concerned to maintain full employment and the question was whether both internal balance (full employment) and external balance (namely a balanced BOP) could be achieved even if the exchange rate was fixed as it had to be under the Bretton Woods System. Mundell and Fleming found that monetary and fiscal policy were the two instruments required to meet the two goals when the exchange rate was kept fixed. Both objectives could be achieved if monetary policy was assigned for external balance and fiscal policy for internal balance. This meant that the rate of interest was to be raised when there was a BOP deficit and reduced when there was a surplus. Similarly, the fiscal deficit would be increased when there was unemployment and reduced if there was inflation.[1]

Phillips curve and policy

A major innovation during the 1960s was the discovery of the Phillips curve which suggested that there was a trade-off between unemployment and the rate of inflation. The existence of such a trade-off had important implications for monetary policy and the exchange rate regime. Two countries might have different preferences between unemployment and inflation. One country might prefer a lower level of unemployment and so would have a more expansionary monetary policy and a higher rate of inflation. This higher rate of inflation would imply that over time its goods would become non-competitive in international markets and it would run a current account deficit, which would ultimately make the fixed exchange rate non-viable. This was an argument in favour of flexible exchange rates.

Stagflation in the 1970s

The world of policy making was thrown into disarray in the 1970s. Expenditures on the Vietnam War and the social programmes created by then president Johnson resulted in large fiscal deficits,which raised the

rate of inflation in the US and this was transmitted to other countries by the fixed exchange rate regime. It also resulted in very large unsustainable deficits in the US BOP.

The very rapid growth in the world economy till 1973 resulted in much higher demand for primary commodities whose prices particularly that of oil, increased sharply in 1973 and 1974. The increased inflation was not tackled by contractionary monetary policy as it was considered to be a supply side problem and contractionary monetary policy would act on the demand side. Central banks followed a policy of cheap money to maintain the level of economic activity. But the rate of inflation kept on increasing.

Meanwhile research by Phelps and Friedman showed that the trade-off between unemployment and inflation as shown by the Phillips curve was because of money illusion. In the long run there was no trade off between the level of employment and output and the rate of inflation.[2] The situation in the 1970s resulted in higher unemployment and higher inflation, what came to be called stagflation.

The new classical macro based on rational expectations and market clearing[3] led to the denial of even a short run Phillips curve. The new open macro economics showed that expansionary fiscal policy would lead to an increase in interest rates and inflow of foreign capital which would lead to an appreciation of the exchange rate that would reduce net exports. So expansionary fiscal policy would drive down exports and there would be no permanent effect on GDP. Monetary policy, however, would be effective. Expansionary monetary policy would lead to a capital outflow and devaluation which would encourage exports. So, monetary policy was to be used for short term economic management.

However, rational economic agents know the effects of monetary policy so any announced monetary policy would have no effect. If the central bank followed a policy rule, namely a systematic monetary policy tied to the state of the economy, it would be anticipated by economic

agents and already incorporated into their decision making and so would have no effect on the economy. A higher money supply will result in an increase in prices without affecting output and employment. It is only unexpected changes by policy makers that surprise economic agents that would affect output in the economy.

Furthermore, according to the real business cycle school each stage of the business cycle, whether boom, recession, recovery or trough is an equilibrium phenomenon, an optimal reaction from economic agents. Aggregate fluctuations in the economy are efficient and require no policy intervention (Snowdon and Vane 2005, pp 295). Money is neutral in affecting the real economy and stabilization efforts are counter-productive (Prescott 1986).

However, there were further developments in Keynesian thought that incorporated wage and price rigidities along with market imperfections and refuted the idea of policy ineffectiveness. The new Keynesian school argued that business cycles based on market failures are more realistic compared to new classicals or the real business cycle school even while maintaining the micro economic foundations and the general equilibrium framework of the new classical framework. The effectiveness of monetary policy now depended on the credibility of the policy and thus lends support to the inflation targeting framework.

III: A new role for monetary policy

The developments in monetary theory resulted in the conclusion that only unanticipated monetary shocks had effects on the economy. But unanticipated monetary shocks had ill effects on investment as investment depended on expectations. So the role of monetary policy became to provide a stable basis for expectations that would then encourage investment. It has been argued by many that policy-makers need to follow rules in order to provide predictability which would encourage optimising decisions (Kydland and Prescott,1972) Traditionally, central banks took account of many factors, inflation, rate of unemployment, the state of the

BOP etc., in determining its monetary policy. However,a monetary policy dependent on so many variables would create considerable uncertainty as to what the monetary policy was actually trying to do. Given the importance of expectations in modern macro economies,it was considered essential that market participants should know what monetary policy to expect. It was concluded that monetary policy should be targeted to achieve a certain rate of inflation and then market participants would form proper expectations regarding whether monetary policy would be loosened or tightened.

More and more countries are adopting a policy of inflation targeting. It is contended that such a policy has resulted in lower rates of inflation-the so-called great moderation.[4] But there are two words of caution. The US also had low rates of inflation during this period though it did not adopt inflation targeting. Secondly, despite no uncertainty about the stance of monetary policy since the crisis of 2008 this has not resulted in higher rates of investment and output, and economies have been operating well below capacity.

It is argued that specification of a Neo-Keynesian DSGE model shows that targeting a zero inflation rate stabilises the output at the natural rate and if there is no gap between the natural and efficient levels of output then this is the optimal monetary policy that leads to zero welfare loss (Blanchard and Gali 2007).[5] But if there is a gap one has to choose an optimal policy either to reduce the gap or to reduce the loss from non-zero inflation. The optimal policy depends then on how far the central bank can pre-commit itself, namely we need a state contingent plan (Clarida, Gali and Gertler 1999).

IV: Monetary Policy in India

Monetary policy geared towards development

Initially, the primary role of the Reserve Bank of India (RBI), established in 1935,was to facilitate the transfer of funds, including the home charges, between England and India so as to maintain a stable exchange rate and

to manage the seasonal flow of funds between the main city banks and the hinterland agricultural centres.

After independence, RBI had two main objectives. On the one hand, RBI was to provide adequate credit to meet the developmental needs of the government and the country. On other hand, it was to ensure price stability. However, the debate on price stability occurred during the budget discussions in the context of the size of the budget deficit that could be financed without generating too great an inflationary pressure. To achieve these goals, the RBI introduced a number of quantitative measures such as Selective Credit Control (SCC), Quota-cum-slab system, Credit Authorization Scheme (CAS) and other social controls. These measures were used to achieve a balance between the needs of developmental expenditure and the inflation level.

Under the SCC introduced in 1956 credit was provided at a preferential rate to certain sectors and was more expensive for other sectors. This assisted the development process without generating undue inflationary pressure and so solved the dilemma whether to control inflation or to finance developmental expenditure. The Quota-cum-slab system introduced by the RBI in the early 1960s was actually a credit pricing process. It laid down minimum lending rates for bank credit. In CAS introduced in 1965, prior permission of the RBI was required for sanctioning of large credit facilities or augmenting large credit facilities already sanctioned. Thus, RBI acted as a credit regulating authority from 1950 to 1970.

The RBI successfully controlled inflation in the first half of the period, 1951-52 to 1963-64,when the average annual inflation was merely 2.1 per cent. However, during 1965-66 to 1974-75 the average rate rose to 10.2 per cent, mainly because of supply side problems. There were two severe droughts in 1965-66 and 1966-67. Then aid was cut-off by the US and the World Bank. Finally, there was a huge increase in the prices of oil and commodities including wheat which had to be imported

in 1973-74. In between, the economy had to cope with the influx of refugees from erstwhile East Pakistan and then the war leading to an independent Bangladesh.

The main assumption that inflation is a domestic phenomenon and not caused by external factors was belied by the spike in inflation since the mid-1960s. The rate of inflation touched 25 per cent in 1973-74. The Chakravarty Committee Report (RBI 1985) concluded that the monetisation of the budget deficit was a significant contributor to the increase in inflation and controlling the increase in money supply was difficult without a proper monetary policy framework.

Shift Towards Monetary Targeting Approach

The monetary targeting approach (MTA) adopted in the 1970s focussed on establishing a nominal anchor to maintain price stability. But this required a stable money demand function. Lack of such stability led a number of countries, Australia, Canada, UK, US, Japan and Switzerland that had adopted MTA during the 1970s, to give it up in the 1980s. India, however, then was a relatively closed economy with an administered price regime under the control of government. The closed economy was supposed to have a stable money demand function and thus it was considered feasible and relatively easy for the monetary authority in India to adopt MTA. However, the shift to monetary targeting required a formal target which RBI should use to target inflation. It was only after the recommendation of the Chakravarty Committee Report (CCR) (RBI 1985) that the RBI decided to adopt M_3 as an intermediate target with reserve money as an operating target.

Adoption of such an approach not only provided monetary policy a proper framework but also enabled better coordination between the government of India and the RBI. The fiscal deficit and its monetisation were to be managed. Other instruments such as inter-bank participation certificates (IBPC), Certificates of Deposits (CD), Commercial Papers (CP) and 182-day treasury bills were introduced to expand the range of

instruments and create market determined interest rates. Further, Discount and Finance House in India (DFHI) was established in 1988 to impart liquidity to the money market.

However, it seems that MTA was actively pursued only from 1990 to 1998 (Mohanty and Mitra 1999), and, further, Callen and Chang (1999) and Mohanty and Mitra (1999) found that monetary targets were achieved in only four years (1985-86, 1987-88, 1990-91 and 1995-96). Introduction of economic reforms in 1991 with increased financial deregulation, changes in the institutional structure, financial innovations and increased capital inflow resulted in an unstable money demand making operating the MTA difficult. Consequently, there was a shift in the monetary policy framework in April 1998 to a Multiple Indicator Approach (MIA)

In MIA, as the name suggests, there was a focus on multiple indicators including both financial and economic variables in determining a policy perspective. Indicators besides monetary aggregates included interest rates in financial markets, movements in currency, bank credit, fiscal position, trade, capital flows, inflation rate, output, exchange rate, refinancing and transaction in financial market were used for drawing policies (Bhattacharya 2006; Inoue 2010). Further, there were changes in the operating procedure from direct instruments (interest rate regulations, selective credit controls, cash reserve ratio) to indirect instruments (open market operations, repo operations and liquidity adjustment facility (LAF)). Adopting LAF along with Market Stabilization Scheme (MSS) and Marginal Standing Facility (MSF) helped in managing liquidity on a daily as well as on an enduring basis. However, MIA came under sharp criticism due to the multiplicity of objectives. Market participants were not sure about which variable the RBI was trying to influence so the RBI could not provide stable expectations about the path for monetary policy. Therefore, there was felt a need for a monetary policy framework that is transparent, credible and accountable with a forward-looking approach. Inflation targeting fulfils this requirement.

V: Shift to Inflation Targeting

Inflation targeting is a monetary policy approach characterized by explicit public announcements of inflation targets and acknowledging low and stable inflation as primary long-run targets (Bernanke et al. 1999). The monetary authority adjusts the money supply if and when the inflation rate deviates from the target/range. This approach arose from policy makers' belief that monetary policy can affect only inflation in the long-run and that inflation is generally harmful for economy. Maintaining low inflation would help achieve other macroeconomic goals (Bernanke, Laubach, Mishkin and Posen 1999). Further, the objective of achieving long-run price stability makes policy makers disciplined, accountable and transparent. On practical grounds, it has been observed that countries adopting inflation targeting, witnessed low inflation rates along with lower inflation expectations and the benefits attached with it (Bernanke, Laubach, Mishkin and Posen 1999).

Developed countries such as New Zealand, Canada, Israel, UK, Sweden, Finland, Australia and Spain adopted ITA in the 1990s itself. Many other countries followed suit with developing countries lagging because they lacked the necessary preconditions, such as a proper inflation index that a central bank can monitor,and well developed forecasting models and adequate knowledge of the transmission mechanism. Also, it was increasingly realized that food and fuel inflation (which is very volatile and where monetary authority has limited control) played a much greater role in developing countries restricting adoption of IT.

In India adoption of ITA was severely criticized as not only unsuitable but also undesirable. A lack of a proper inflation index, choice of inflation target, prevalence of agricultural shocks, inefficient transmission mechanism, lack of a well-developed capital market as well as accurate forecasting techniques make the Indian economy unsuitable for ITA (Mahajan, Saha and Singh 2014; Gupta and Sengupta 2016). It was further argued that ITA may not be efficient in the Indian context because of the dominant role of food and fuel prices. Despite all the criticisms, India formally shifted in January 2015 its monetary policy

approach from MIA to ITA, as recommended by the Urjit Patel committee report (RBI 2014).

India adopted IT with an aim of achieving an inflation target of below 8 per cent by January 2015, 6 per cent by January 2016 and finally adopting an inflation target of 4 per cent with a band of (+/-) 2 percent. The wide inflation target range allows accommodation of external shocks. Besides this, the committee decided to change the inflation index from WPI to CPI (combined)[6] and a five member monetary policy committee headed by the governor of the RBI that would be responsible as well as accountable for all the monetary policy decisions. Thus, the main reason for adopting ITA was not only to bring about price stability in the economy but also to develop transparency, credibility and accountability in monetary policy making.

However, given the structure of the Indian economy, objectives such as anchoring inflationary expectations, reducing uncertainty and achieving price stability will be a great challenge for the RBI. The inflation and growth rates between 2012-13 and 2017-18 are given in Table 1. The annual inflation measured in terms of CPI (C) has decreased from 10.1 per cent in 2012-13 to 5.8 per cent in 2014-15 and further to 3.6 per cent in 2017-18. Meanwhile, output growth increased from 2012-13 to in 2014-15 but declined subsequently (Table 1).

Table 1: GDP growth and Inflation

Year	GDP Growth	CPI (C)
2012-13	5.4	10.1
2013-14	6.0	9.4
2014-15	7.2	5.8
2015-16	8.2	4.9
2016-17	7.1	4.5
2017-18	6.5	3.6

Source: R BI Handbook of Statistics of the Indian Economy

It seems inflation has come down sharply without adverse effects

on growth after the adoption of ITA. However, it would be premature to judge the performance of the approach based on such a short-time period. Mohan (2008)argues that the credibility of a central bank is achieved slowly by achieving the target and not by announcements. Mishkin (2001) stressed that credibility is not a free lunch of inflation targeting but is achieved though short-run losses in output and employment.

It is, however, not clear whether any accountability measure for failure to achieve the target has been established. However it should be clear that India did not adopt strict inflation targeting in which price stability is the only objective. Rather it shifted to flexible inflation targeting where both price stability as well as the stability of the economy are objectives. Price stability is an explicit target with employment as an implicit target.

VI: Is There A Credibility Bonus of Adopting ITA in India?

The sacrifice ratio for India

Since India adopted ITA in only January 2015, analysing its performance would be premature and naïve. However, to give a sense of how IT has worked in India, we first try to understand whether adopting inflation targeting has been more or less costly compared to MIA. To analyse this problem we estimate time varying sacrifice ratio (SR) from the early 1990s. The idea is to compare the SR across different time periods, i.e. pre-ITA and the post-ITA. The essence of estimating SR is that it gives a sense of cumulative loss in the output due to a permanent reduction in inflation by policy makers. So, the magnitude of the SR determines how costly disinflation is. The link between adopting ITA and SR has long been debated but, as yet, is inconclusive.

The question whether there is a SR bonus to adopting IT is controversial. A number of studies including Fischer (1996), Debelle and Fischer (1995), Posen (1998) and Walsh (1995) argue that there

is no credibility bonus in adopting IT. They argue that central bank independence, which is a prerequisite for IT, does not reduce SR rather it may increase it. However, others, Cukierman (2002) and Ball (1991), argue that enhanced credibility arising from IT, helps in controlling inflation persistence that results in low SR. Although there are numerous studies analysing the effect of IT on the SR, the findings are still not conclusive.

We estimated time varying SR for India from the basic aggregate supply curve (Phillips Curve) wherein inflation is a lagged function of inflation and output gap. We also used deficit rainfall to capture supply shocks. Inflation rate is calculated from the wholesale price index (WPI) while output gap is the difference between actual output and potential output measured through HP-filter. For the rainfall data, we estimated the percentage change in the actual rainfall during South-West monsoon (June to September) from that of the normal rainfall during these months.[7] Inflation and output data is collected from *Handbook of Statistics*, RBI while rainfall data is from *Indian Metrological Department* (IMD) different reports. The data is collected on an annual basis from 1963 to 2018 and a rolling regression with a window size of 30 years is performed. To estimate the sacrifice ratio, we use the baseline formula as discussed in Mitra et al. (2015): {(1-coefficient of Inflation)/coefficient of output gap)}. The results obtained from the rolling window regression are given below in Figure 1:

Clearly SR has been varying over time (Fig. 1). While till 2002, SR was between 2 to 4, since 2004 it has been below 2 except for 2003. Low SR suggests that policy makers may further reduce inflation without sacrificing output. There may be a credibility bonus for policy makers in India.

Evaluation of IT a Cross Country Approach

To analyse the efficacy of IT, we carried out a cross country analysis for some developing countries who adopted IT. Table 2 below gives the names of the countries, the average inflation rate, growth rate and

external debt as a percentage of gross national income in the pre and post IT period.[8] Table 2 also contains the time period over which IT was adopted, the date of adoption as well as the inflation target/range. The main objective here is to analyse the effect of IT on the economy. Along with India, we included 10 more developing countries: Brazil, Colombia, Ghana, Indonesia, Mexico, Philippines, Peru, SA, Turkey and Thailand

Figure 1: Time Varying Sacrifice Ratio
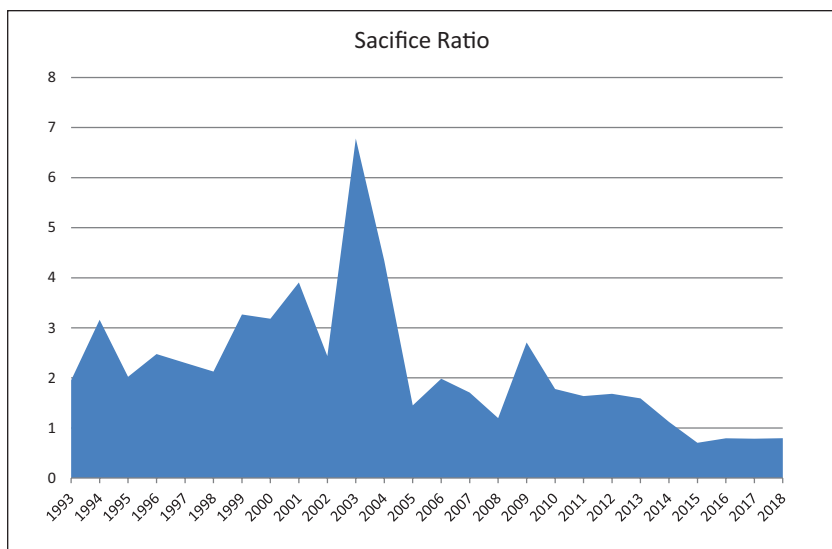
Source: Author's calculations

We estimated decadal average value of inflation, growth rate and external debt prior to the adoption of IT and compared these values with their average values in the post-ITA regime. The general argument derived from the Phillips curve is that IT lowers the level of inflation. However, such reduction comes at a cost of increasing loss in the level of employment/output, an increase in the SR. On the other hand, proponents of IT argue that to achieve growth for any country, it is important to maintain stable prices. Adopting IT not only brings credibility in the system but also reduces inflation, which gives an impetus to growth. To examine the effect of IT, we analysed cross country data and all the results are given in Table 2.

Table 2: Developing Countries with ITA

Country	Inflation Rate	GDP Growth	External Debt	Time Period	Adoption Date	Inflation Target
Brazil	851.57	1.88	28.16	1990-99	1999	4.5 +/- 2
	7.89	2.48	26.78	2000-17		
Colombia	22.89	2.86	35.57	1990-99	1999	2 to 4
	6.61	3.93	30.43	2000-17		
Ghana	26.61	4.81	89.39	1997-2007	2007	8.5 +/- 2
	19.51	6.92	37.86	2008-17		
India	6.53	7.71	19.10	2004-14	2015	4 +/- 2
	2.87	7.32	21.02	2015-17		
Indonesia	17.23	3.36	80.68	1995-2005	2005	5 +/- 1
	8.28	5.54	32.85	2006-17		
Mexico	20.33	3.13	32.28	1990-2001	2001	3 +/- 1
	5.02	2.09	29.18	2002-17		
Philippines	8.23	3.27	60.43	1992-2002	2002	4 +/- 1
	3.45	5.63	31.74	2003-17		
Peru	16.72	3.96	57.95	1992-2002	2002	2 +/- 1
	3.38	5.36	36.61	2003-17		
South Africa	10.72	1.64	18.07	1990-2000	2000	3 to 6
	6.84	2.81	31.35	2001-17		
Turkey	49.89	4.76	43.97	1996-2006	2006	5.5 +/- 2
	7.88	5.08	42.80	2007-17		
Thailand	4.39	5.13	57.84	1990-2000	2000	0.5 to 3
	2.70	4.01	34.37	2001-17		

Source: World Bank Data Bank

In Table 2, the first three columns represent the average inflation rate, GDP growth rate and external debt as a percentage of GNI in the pre and post-IT period. We also give the inflation target/range of each country at the time of adopting IT. From Table 2, it is quite clear that the average inflation rate in all the countries has sharply declined in the post-IT regime compared to the pre-IT regime. The fall in inflation, however, was not immediate. Most of the countries could not achieve their target as mandated during the adoption time. It was only in the recent past that most of the countries could keep their level of inflation well within the targeted level. Though Indonesia, Philippines, Peru, SA, Turkey and Thailand adopted IT in the early 2000s, they achieved their target level of inflation only after 2012.

Considering the growth rate and external debt in the pre and post-IT regime, we observed that GDP growth rate on an average has increased while external debt has declined in the post-IT regime. Mexico and Thailand were the only two countries that showed a marginal decline in the average growth rate from 3.13 and 5.13 per cent in the pre-IT period to 2.09 and 4.01 per cent in the post-IT period respectively. Considering the external debt, SA showed an increase from 18 per cent in the pre-IT regime to 31 per cent in the post-IT regime. All other countries showed a sharp fall in the external debt after adopting IT. We also performed paired two sample test for means to confirm if the difference between the two average values in the pre and post-IT regime is statistically significant. From this test, even at 5 per cent level of significance we could reject the null of no difference between the means for all the three variables.

So, from a cross country level of analysis of these developing countries, it is evident that countries after adopting IT have shown a significant reduction in their level of inflation as well as the external debt. The GDP, however, showed a positive decent growth. The question that still remains unanswered is whether the changes in inflation, growth and external debt in the post-IT regime is an outcome of IT per se or guided by some other factors. However, the correlation coefficient of the GDP

growth rate of these countries with the world GDP growth rate is low (Table 3) suggesting that these economies, except for South Africa and Turkey, were not growing fast because the world economy was growing fast. It may have been because of adoption of IT.

Table 3: Correlation Coefficients

Correlation Coefficient	
Country	World
Brazil	0.45
Colombia	0.31
Ghana	0.04
India	0.32
Indonesia	0.12
Mexico	0.55
Philippines	0.56
Peru	0.35
South Africa	0.71
Turkey	0.66
Thailand	0.14

Source: Author's calculations

Some of the countries have adopted IT for a long enough period that we can try to assess whether the option of IT has ameliorated the effect of the 2008 crisis. For a number of them, Brazil, Peru, South Africa and Thailand there has been a sharp fall in the rate of growth (Table 4). This happened despite the IT seemingly providing stable expectations and no significant effect of world growth rates on these economies. For a number of them such as Brazil and Mexico, the poor growth performance was accompanied by substantial overshooting of the inflation target. South Africa made significant progress towards meeting the inflation target but at the expense of a considerable slowdown in growth.

Table 4: Growth and Inflation pre and post 2008 crisis

Brazil	Inflation	GDP Growth	External Debt
1999-2008	8.321	3.423	32.534
2009-2017	7.423	1.201	22.209
Colombia			
1999-2008	9.611	3.375	31.805
2009-2017	3.945	3.647	30.114
Mexico			
2001-2008	5.971	1.895	20.517
2009-2017	4.295	2.169	31.600
Philippines			
2002-2008	4.900	5.158	47.539
2009-2017	2.402	5.773	22.842
Peru			
2002-2008	3.135	6.577	42.679
2009-2017	3.199	4.428	33.719
SA			
2000-2008	7.817	4.171	22.337
2009-2017	6.090	1.610	39.005
Thailand			
2000-2008	3.162	4.872	39.548
2009-2017	2.077	3.199	32.533

Source: World Bank Data Bank

One has to be cautious about drawing conclusions. These countries grew considerably faster in earlier periods, particularly the period 1965-73 though this growth was accompanied by a higher rate of inflation (Table 5).

Table 5 Inflation and GDP Growth, 1965-73 and 1974-82

Brazil	Inflation	GDP Growth
1965-73	27.42	8.82
1974-82	62.15	4.88
Colombia		
1965-73	11.91	5.73

1974-82	24.34	4.24
Mexico		
1965-73	5.18	6.47
1974-82	28.13	6.14
Philippines		
1965-73	8.50	5.35
1974-82	13.04	5.17
Peru		
1965-73	10.72	4.34
1974-82	45.88	3.13
SA		
1965-73	6.94	4.71
1974-82	13.78	3.15
Thailand		
1965-73	3.66	8.16
1974-82	8.76	6.75

Source: World Bank Data Bank

VII: Conclusions

The objective of monetary policy after a detour has returned to control of inflation as it was under the GS. But whereas it was geared to external conditions during the GS, it has moved full circle and should now be geared towards maintaining internal balance.

India started experimenting with different frameworks for monetary policy once it became clear that monetisation of the budget deficit had a significant influence on the rate of inflation. It has finally settled on inflation targeting.

Our preliminary findings from a panel of developing countries that have adopted inflation targeting shows that adoption of inflation targeting reduces inflation, raises growth rates and reduces external debt. However, this needs to be qualified. The stable expectations provided by IT have

not always been successful in reducing inflation to the target range. Furthermore, even though the inflation rate has not be achieved, growth fell after the crisis. In South Africa inflation fell towards the target but at the cost of substantial output loss. Furthermore, before the oil price rises in 1973-74, these economies grew at considerably higher rates though this was accompanied by faster inflation. The lower inflation seems to be at the cost of slower growth.

Endnotes

[1] The appropriate assignment of instruments would lead the economy to achieve both its objectives. Inappropriate assignment,for instance monetary policy to internal balance and fiscal policy to external balance would drive the economy away from its equilibrium position.

[2] For the rate of inflation to come back to the previous level the economy would have to go through a period of disinflation.

[3] New classical school analyse equilibrium models using continuous market clearing assumption within the framework of competitive markets and thus sought to restore classical models.

[4] Using monetary policy to target inflation is not a new idea. Keynes (1924) said that the objective of monetary policy is to maintain stable prices.

[5] For a more detailed discussion see Gali (2018) *Journal of Economic Perspectives*.

[6] CPI(C) comprises of Consumer Price Index- Rural Labourers (CPI-RL) and Consumer Price Index- Urban Non-manual Labourers (CPI-UE) including the cost of living of rural as well as urban population.

[7] The rainfall from June to September is considered as the most crucial rainfall for Kharif as well as Rabi production

[8] All the data used here has been obtained from the world bank data set

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