SBP Research Bulletin
Volume 5, No. 1, May, 2009

Choice of Monetary Policy Regime: Should the SBP Adopt Inflation Targeting?

Moinuddin[*]

Monetary aggregate targeting is based on a stable and predictable relationship between inflation and monetary aggregate(s). However, structural changes both in the economy as well as in the financial sector, financial innovation and increasing application of technology have significantly weakened the relationship between inflation and money. The major finding of this paper is that money demand function is unstable in Pakistan, therefore monetary aggregate targeting is not suitable. Consequently, inflation targeting (IT) may be an option for the SBP; it has superior qualities of easy to understand target, flexibility, transparency and being more amenable to accountability. However, some pre-requisites such as fiscal prudence, independence of central bank, legislative support, availability of an appropriate measure of inflation and improvement in technical skills of the staff are required before the adoption of IT. It is argued that since the SBP lacks many of these pre-requisites, it may adopt IT Lite as a viable option in the mean time.

JEL Codes: E3, E31, E52
Key Words: inflation targeting, money demand function, monetary policy regime

1. Introduction

At present, the SBP is pursuing monetary aggregate targeting. This approach implicitly assumes that money demand function is stable and a predictable relationship exists between monetary aggregates and inflation. In most economies, however, it is observed that this relationship has weakened and resulted in instability in the money demand function during the past couple of decades. The weak relationship between monetary aggregates and inflation therefore made it impossible to target monetary aggregates (Maravic and Palic, 2005). The probability of missing the final target (inflation) by achieving a specific

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[*] The author is senior joint director in Economic Analysis Department of the State Bank of Pakistan. He is grateful to Riaz Riazuddin for useful suggestions and improvements in the earlier drafts of this paper. He is also indebted to Omar Farooq Saqib, Amin Lodhi and Farooq Arby for their valuable suggestions, editorial assistance by Ms. Uzma Shakir is also appreciated. However, the responsibility of any remaining errors is with him. Comments and suggestions are welcome.

intermediate target (monetary aggregate) has significantly increased. In such a scenario, central bank has no other option but to abandon monetary aggregate targeting. Bouey (1983), former Governor, Bank of Canada described this well, "*we did not abandon M1, M1 abandoned us*."

Massive structural changes in Pakistan's financial sector raised the concern whether stable relationship between monetary aggregates and inflation exists or not. Sassanpour and Moinuddin (1993) reject any structural shift in money demand function as a result of introducing Islamic banking during the mid-1980s. Likewise, Khan et al. (2000) also conclude that money demand function is stable. However, their sample sizes (1974-1992 and 1972-1999) are unable to fully capture the impact of the financial reforms of the 1990s. In particular, the impact of liberalization of interest rates implemented in 1996 was difficult to be captured by the customary inference methods (usually Chow break-point test).

In fact, financial reforms of the 1990s brought significant changes in the Pakistan's financial sector, and raised question on the existence of a stable money demand function and continuation of monetary aggregate targeting regime. In case of departure from the existing monetary policy regime, the State Bank of Pakistan (SBP) would have possibilities of using exchange rate, inflation or nominal income as the choice of nominal anchor.

In this background, this paper is an attempt to answer two questions: (a) having a number of observations on post reform data, does money demand function still exhibit a stable relationship between monetary aggregate and inflation? (b) If the answer is negative, then is inflation targeting (IT) suitable given the specific circumstances in Pakistan?

The following section provides review of literature. Section 3 reports estimation results of money demand function. Section 4 reports the possible policy options. A brief introduction of IT is covered in section 5. An evaluation of pre-conditions for IT in the background of Pakistan is presented in section 6. The final section contains conclusion and policy recommendations.

2. Review of Literature

The importance of a stable money demand function in formulation of macroeconomic policies (especially monetary policy) cannot be undermined.

However, significant structural changes in the economy, financial innovation[1] and continued improvement in technology could disturb a stable and predictable relationship between money and prices. A considerable work has been done in search for a stable money demand function for different countries. For example, Judd and Scadding (1982) argue that financial innovation which allows public to economize on its holdings of transaction balances is the most likely cause of instability in money demand function since 1973. In fact, a rapid advancement in technology reduced the transaction cost as well as facilitated high degree of financial innovation. Both these factors made it difficult to capture the representative demand for money in money demand function. However, it can be argued that a stable money demand function could be estimated, if the financial industry and transaction costs settle down or if someone devises a way to adequately model the transaction costs (Duprey, 1980).

Nevertheless, it is difficult to estimate a stable money demand function due to introduction of innovative financial products, changing preferences for holding financial instruments by households and businesses and rapid advancement in technology available to financial sector. Therefore, while many countries abandoned monetary aggregate targeting in absence of a stable money demand function; exchange rate targeting also failed in various countries due to speculative attacks and subsequent financial crises particularly during 1990s. In search of a nominal anchor for the monetary policy, New Zealand adopted full fledged inflation targeting (IT) in 1990.

Contrary to general belief, an idea similar to IT (price stability) was successfully adopted in Sweden during the 1930s. Berg and Jonung (1998) explain the mechanism of Swedish experience as well as highlight the similarities and differences of price level targeting in 1930s in Sweden and inflation stabilization under IT during the1990s.

The implementation of IT and experiences of New Zealand and other countries lead to extensive literature on IT in the second half of the 1990s to date. The greater contribution on the subject, during this period came from Bernanke et al. (1999). Their book not only examines background, economic environment at the time of IT adoption and experiences of each country, it also explains IT framework.

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[1] Judd and Scadding (1982) explain various channels of financial innovation, which bring instability in money demand function.

The volume of more interesting work on IT significantly increased after adoption of IT by some emerging economies, particularly in East Asia. Importantly, many authors argue that those pre-conditions that were initially considered a must for a country to embark upon IT, are not required (Masson, et al., 1997and Brash, 2002). However, it is concluded that the adoption of IT is linked with the legal and administrative arrangements. These changes often result in the more independence of central banks, particularly in terms of instrument setting (Bernanke and Mishkin, 1997). In sharp contrast, some authors conclude that due to absence of a number of pre-conditions for IT (central bank independence, fiscal dominance, technical skills, etc.), most of the developing countries are not in a position to adopt IT regime (Masson, et al., 1997).

Literature on IT since 2000 is more focused on the evaluation of the performance of IT regimes. Most of the studies conclude that limited experience of IT and the fact that IT regimes did not face any severe shock so far to test their resilience, do not permit to establish concrete conclusion (Zaidi, 2005, Ball and Sheridan, 2003 and Bernanke and Mishkin, 1997). It is interesting to note that all ITers are significantly different in terms of operational characteristics, level of transparency and impact of monetary policy (Hebbel and Tapia, 2002). However, most of the studies found that inflation targeting has a significant impact on economic performance (Gürkaynak et al., 2006, IMF, 2005, and Nicholas et al., 2005). Even researchers who disagree with the superior performance of ITers, almost all of them accept that IT is a better regime. For example, Roger and Stone (2005) mentioned that inflation targets were missed about 40 percent of the time, but no country has dropped IT due to: (a) flexibility of the framework; (b) high standard of transparency and accountability; and (c) lack of realistic alternatives. Similarly, Willard (2006) conclude that though the effect of IT on inflation is small and insignificant, existence of IT during the 1990s created global awareness towards the cost of inflation and thus played a role in reducing inflation during the past decade. In the same line, Ball and Sheridan (2003) also prove that IT does not improve the economic performance of ITers compared with the non-ITers, but they are of the view that their results do not provide any argument against IT. They also recommend IT on the basis of: (a) political reasons that policymaking under IT is more open and the role of central bank becomes more consistent with the principles of democratic society; and (b) IT may improve performance in the future because ITers may handle big supply shocks and political pressures for inflation better than the "just do it"[2] approach of monetary policy.

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[2] This is well described in one of his speeches by King, Mervyn (2004), "*The Institutions of Monetary Policy*", available at: http://www.bankofengland.co.uk/publications/speeches/2004/speech208.pdf.

A considerable literature on the prospects of Pakistan to adopt IT is also available; findings of the studies were mixed. For example, while weak exchange rate pass-through favors Pakistan for adoption of IT, significance of imported inflation, relatively low impact of monetary policy on inflation, strong likelihood of considerable loss of output and negative growth at the initial phase of IT made a strong case against adoption of IT (Akbari and Rankaduwa, 2005). Similarly, Chaudhry and Choudhary (2005) argue that the SBP should not adopt inflation targeting because major cause of inflation in Pakistan is the rise in import prices while effect of monetary policy on inflation is negligible and statistically insignificant.

In sharp contrast to these, some researchers found that this is probably the best time for Pakistan to adopt IT, given the improved macroeconomic fundamentals and recent trend of low inflation (Khalid, 2005). Moreover, Zaidi (2005) and Khalid (2005) both propose that a flexible or inflation targeting lite (ITL) is a better option for Pakistan.

3. Money Demand Function

A number of studies have been conducted on demand for money function regarding Pakistan, from simple regression (Mangla, 1979), to complex divisia monetary aggregates (Tariq and Mathew, 1997) and error correction models at disaggregated levels (Khan et al., 2000). Despite different techniques and a variety of hypotheses seeking diverse objectives, all these studies are based on the conventional proposition that demand for real balances is a function of a scale variable and an opportunity cost variable. While scale variable is used to proxy the transaction demand for money, opportunity cost variable captures the speculative and precautionary demand motives for holding money. To maintain the true spirit and to avoid overshadowing this basic proposition, a simple money demand function has been estimated with cointegration technique to avoid spurious regression as well as to estimate an error correction model to explore short-run dynamics of this relationship.

Table 1. Augmented Dicky Fuller Test*

Variable	Level	1st difference
Real M2	0.53	-4.84
Real GDP	-0.47	-3.36
Real interest rate	-2.18	-3.71

* Critical value at 5% level of significance is -2.95.

To confirm a long-run co-integrated relationship between real money balances, we chose broad money (M2), real GDP for scale variable and call money rate for opportunity cost variable.[3] Nominal money balances were deflated by using CPI to obtain the time series of real money balances. Moreover, log of real GDP as well as real money balances were used while real interest rates were used in level form. It may be noted that real call money rate was used which is short run borrowing rate in inter-bank market and equivalent to Federal Funds Rate in USA. Data was obtained from various issues of Economic Survey of Pakistan and the SBP annual reports. All estimations were done by using EViews version 3.1. All of these variables were found to be I(1) (Table 1).

The following equation was estimated.

$$m_t = a_0 + a_1 y_t + a_2 y_t + \varepsilon_t \tag{1}$$

Where m = *real money balances;* y = real GDP and r = real interest rates (inflation adjusted call money rate), ε = error term, and subscript t refers to time.

Estimated results are reported in Table 2.
The error term of estimated equation is found to be stationary, which implies that these variables are co-integrated. In other words, a significant long-run relationship exists between these variables during 1974-2006. While, equation (1) for the full sample could pass only cumulative sum (CUSUM) test for stability (Figure 1), it failed to clear cumulative sum square (CUSUM Square) and Chow break-point tests, the latter test suggests structural break in 1991 (Table 3). This is an important finding in contrast to the earlier studies on the subject and suggests that financial reforms significantly contributed to structural changes in money demand function. When government started borrowing on market-based interest rate through auction of government securities, residents were allowed to open foreign currency deposits. Moreover, at least one state owned bank was privatized and new private banks were issued licenses for business. Increasing use of technology (ATM, debit cards, credit cards, etc.) further augmented these structural changes through altering the cash preferences of the firms and households.

[3] M2 is the key monetary policy variable for formulation, conduct and monitoring purposes. Call money rate has an advantage of being a good proxy for the cost of funds in money market. Finally, real GDP is the broadest (and most acceptable) representation of the scale variable.

Table 2. Results of Simple Money Demand Function

	Eq-1		Eq-1(a)		Eq-1(b)	
	Coefficient	***t-stat***	**Coefficient**	***t-stat***	**Coefficient**	***t-stat***
Constant	-4.59	-11.6	-3.48	-3.7	-7.9	-9.1
Real GDP	1.25	46.4	1.17	17.9	1.5	25.5
Call money rate	0.0008	0.3	0.005	1.7	-0.01	-3.7
Adj.R^2		0.99		0.97		0.98
Durbin Watson		0.82		1.46		1.34
F-Statistics		1253.8		232.9		328.6
Stability Test:						
CUSUM	Stable		Stable		Stable	
CUSUM Square	Unstable		Unstable		Stable	
Chow Break-point test	Unstable (1991)		Unstable (1981)		Unstable (2002)	

In this background, the same equation for the sub-sample periods (i.e.1974-1990 and 1991-2006) was estimated again. Interestingly, equation for the 1974-1990 period passed the CUSUM test, but exhibited structural break with CUSUM squares and Chow break-point test at 1981. Similarly, equation for the sub-sample 1991-2006 passed both CUSUM and CUSUM Square tests, but failed to pass Chow break-point test (Figure 3). It reveals that estimated money demand function is unstable throughout the sample period due to fundamental and rapid structural changes in the financial system.

Table 3. Results of Chow Break-point Test

Cointegration equation

Sample Period	Break	F-Statistics	Probability	Log Likelihood Ratio	Probability
1974 - 2006	1991	5.8	0.00	16.3	0.00
1974 - 1990	1981	2.2	0.14	8.1	0.04
1993 - 2005	2002	2.5	0.12	8.8	0.03

Chow break-point test has been criticized due to its sensitivity to the presence of even moderate hetroscedasticity (Darrat, 1986) as well as this test does not identify the sources of instability (or structural change). Therefore, some alternative test is necessary to confirm the above findings and to identify the sources of instability in demand for money function for Pakistan in the sample period. Gujrati (1970) suggests the use of dummy variables to find out whether the source of structural break(s) is due to intercept or due to slope variables. For this, equation (1) was re-estimated with the introduction of an intercept dummy (D91) for 1991, and two multiplicative slope dummy variables for real GDP and real interest rate. The dummy variable for 1991 was introduced because of most of the fundamental changes in the financial architecture of Pakistan and financial reforms introduced during this period. The following equation was estimated.

$$\begin{aligned} Real\log(M2) = &\underset{(-4.4)}{-3.48} + \underset{(-3.2)}{-4.43(D91)} + \underset{(21.0)}{1.17(logrealGDP)} \\ &\underset{(3.2)}{+0.030(logrealGDP*D91)} + \underset{(2.0)}{0.005(real\ interest\ rate)} \\ &\underset{(3.4)}{-0.02(real\ interest\ rate*D91)} \end{aligned} \tag{2}$$

Adj.R^2 = 0.99 Durbin-Watson = 1.44 F-Statistics = 744.1

Figures in parentheses are *t* statistic.

The estimated equation reveals that both intercept and slope dummy variables are significant and suggests that instability in the money demand function is caused by the changing relationship with both scale variable as well as opportunity cost variables.

While structural shift in intercept appears to be a function of gradual and steady monetization in the economy,[4] the instability in slope dummies is attributed to a number of factors. In particular, monetary policy and structure of the financial sector in Pakistan witnessed fundamental changes during the last 32 years. The first significant policy change was the nationalization of private commercial banks with the creation of National Credit Consultative Council (NCCC) and Pakistan Banking Council (PBC) in 1974. NCCC was granted the authority to set credit ceilings and mandatory credit targets at sectoral level for each bank. Moreover,

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[4] It is also evident from M2 to GDP ratio, which rose from an average 31.1 percent during FY74-FY90 to 38.4 percent during FY91-FY06.

Stability Tests: CUSUM and CUSUM Square

Figure 1: Sample: 1974-2006

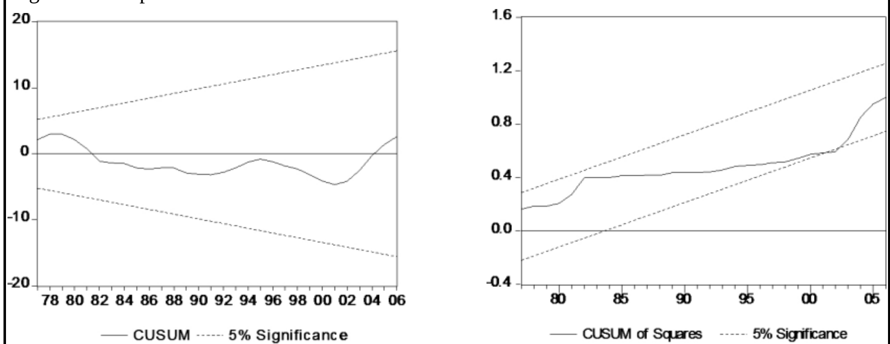


Figure 2: Sample: 1974-1990

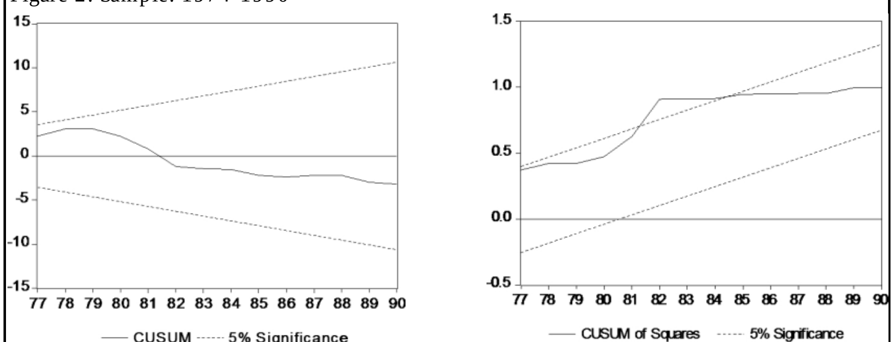
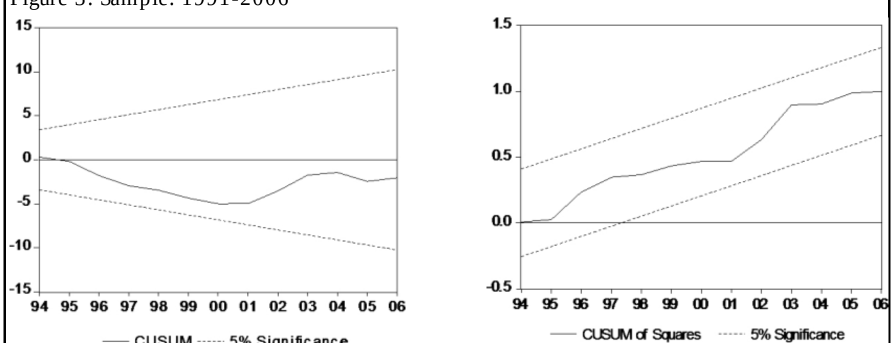


Figure 3: Sample: 1991-2006



under directed credit controls, interest rates were also determined by the central bank. In early 1980s, Pak rupee was de-linked with the US dollar and came under managed float. Subsequently a continued devaluation in the value of Pak rupee increased the attractiveness of foreign currency holdings for the residents. The financial sector saw another major structural change in the mid 1980s with the introduction of Islamic banking, which resulted in introduction of profit & loss sharing saving accounts and mushroom growth of leasing and modaraba companies under non-bank financial institutions. These NBFIs introduced different (new) saving instruments of different maturities. However, directed credit and regulated interest rates resulted in financial repression. The banking system accumulated huge non-performing loans, reflecting both moral hazard as well as political influence over commercial banks. Since the controlled interest rates were not reflecting the true cost of the funds, misallocation of the scarce financial resources was an obvious outcome, which was further augmented due to inherited inefficiency in state owned commercial businesses.

In order to revamp and revitalize the financial sector, the first phase of comprehensive financial reforms was implemented in the early 1990s. As a result, the State Bank of Pakistan abandoned the use of direct instruments of monetary policy. Public sector commercial banks were privatized, and interest rate ceilings were removed. In the second phase of the reforms since 1999, greater focus is on the regulatory strengthening, implementation of Basel II, improved governance, and institution building. Moreover, ample liquidity and stiff competition in the banking sector during post 9/11 period resulted in a rapid growth in consumer financing, which offers both new opportunities for the banks as well as risks, as this new market segment is yet to be tested for an adverse shock. The enabling environment for the financial sector provided support to the financial innovation. Not only growth in the credit to private sector was unprecedented, a visible change in the credit cycle was also evident. All these indicators also point out that further structural change is underway in the financial sector.

The following error correction equation was also estimated to investigate further.

$$\Delta m_t = \underset{(6.6)}{1.25\Delta y_{t-1}} + \underset{(0.6)}{0.002\Delta r_{t-1}} - \underset{(-1.6)}{0.27\varepsilon_{t-1}} \qquad (3)$$

Adj.R^2 = -0.23 Durbin-Watson = 1.66

Figures in parentheses are *t* statistic

Importantly, short-term relationship between real money balances, real GDP and real interest rates is insignificant. Estimated error correction equation (3) reveals that only scale variable has a significant impact on real money balances, while the impact of real interest rate and error correction term both are no different from zero. This implies that an insignificant relationship should not be used for planning and targeting purposes. This is important because monetary targeting is generally done for short term, usually for one-year. Not surprisingly, the monetary targets in recent past (estimated on the basis of unstable money demand function) were missed with big margins (Table 4).

Moreover, actual inflation also significantly exceeded with the targeted inflation, which seems to suggest that monetary aggregate targeting is largely unable to produce desired results. It is pertinent to mention here that following the successful completion of Poverty Reduction and Growth Facility (PRGF) program with IMF, the SBP adopted an easy monetary policy and broadened the scope of monetary policy by incorporating important indicator variables other than broad money (Husain, 2005). In view of the above, it clearly appears that the SBP has to abandon its present monetary regime and adopt some other suitable monetary policy framework.

Table 4. Monetary Expansion and Inflation

percent

	M2 growth		**CPI**	
	Target	**Actual**	**Target**	**Actual**
FY00	9.4	10.6	6.0	3.6
FY01	10.3	9.0	4.5	4.4
FY02	9.5	15.4	5.0	3.5
FY03*	16.0	18.0	4.0	3.1
FY04	11.0	17.6	3.9	4.6
FY05*	14.5	19.0	5.0	9.3
FY06	12.8	15.2	8.0	7.9

Source: Various Annual Reports, SBP.

* Targets were revised upward during the mid-year review by NCCC.

Table 5. Trade Openness in Exchange Rate Targeting Countries

2003	**Export/GDP ratio**	**Import/GDP Ratio**
Botswana	41.77	32.86
Costa Rica	46.78	48.56
Denmark	42.74	36.55
Honduras	36.72	54.11
Malaysia	113.37	92.5
Uruguay	25.57	23.19
Pakistan*	13.37	14.65

Sources: 1. Stone and Bhundia (2004) for the classification of the countries.
2. World Bank Database: www.devdata.worldbank.org
* SBP: the corresponding figures for FY06 are 12.8% and 19.2%.

4. Available Options for SBP

In case, SBP abandons monetary aggregate targeting, the alternative monetary policy regimes available to SBP are: (a) exchange rate targeting; (b) nominal income targeting; (c) interest rate targeting; and (d) inflation targeting.

Exchange rate targeting is a popular choice of a number of open emerging economies. However, the possibility of favoring exchange rate targeting for Pakistan is thin because; (a) trade-to-GDP ratio is low (about 32% in FY06) (Table 5); and (b) the exchange rate pass-through effect on domestic inflation in Pakistan is quite weak (Hyder and Shah, 2004). In fact this regime is advantageous for the countries with a higher trade-to-GDP ratio (Stone and Bhundia, 2004).[5] Moreover, the weak exchange rate pass-through itself provides support to an inflation targeting regime (Akbari and Rankaduwa, 2005) instead of opting exchange rate as a nominal anchor.

In case of nominal income targeting, most of the scholars argue that this is not a viable solution since the target has both the components output and inflation, which makes inflation target flexible (Debelle, 2000). Moreover, since monetary policy actions are transmitted to output and inflation with different lag structures, achieving nominal income target becomes complex as well as the credibility of monetary actions remains vulnerable. Not only communicating the nominal income target to the public is less transparent and difficult, accountability is also vague because of the possibility that if inflation exceeds sharply, the impact of this would be partially offset by a lower output growth.

As far as interest rate targeting is concerned it assumes output and price stability in the economy. However, attempts to stabilize the interest rates may result in larger volatility in output and inflation, since any shift in the goods market equilibrium (IS curve) would bring larger changes in the equilibrium level of output because of horizontal LM curve at a given interest rate (Meenai, 2001). Indeed, a greater volatility in key macroeconomic variables is not desirable. In addition, as a result of demand shock under constant interest rate targeting, demand for money will increase and the central bank's efforts to avoid revision in interest rate target would further stimulate the economy (Meyer, 1998). Moreover, Leitemo (2000) suggests that the performance of interest rate targeting is generally

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[5] According to Economic Freedom Index 2006, Pakistan's score for trade openness is 4.5, which puts Pakistan at 126th number out of total of 162 countries. This report is available at http://www.heritage.org/research/features/index/ .

weaker when compared with macroeconomic outcome under a constructed optimal discretionary policy regime.

Leitemo (2000) also refers interest rate targeting as an intuitive way to inflation targeting. Therefore, a direct approach towards inflation targeting seems more appropriate. In this backdrop, IT regime appears to be the best choice for the SBP at the moment. A brief introduction and evaluation of inflation targeting is presented in the following section.

5. Inflation Targeting: An Introduction

Inflation targeting (IT) is a monetary policy framework that suggests a narrower focus of the central bank on price stability with enhanced transparency and accountability. Bernanke and Mishkin (1997) define IT as "*approach which is characterized by the announcement of official target ranges for the inflation rate at one or more horizons, and by explicit acknowledgment that low and stable inflation is the overriding goal of monetary policy*." Thus under IT, the official commitment to achieve a low inflation solves the problem of dynamic inconsistency that produces higher average inflation (Ball and Sheridan, 2003). This policy framework is in sharp contrast to environment in developing countries like Pakistan, where monetary policy is muddling among conflicting objectives with relatively weaker commitment to low inflation. In this background, an overview of evolution of IT would be instructive.

Initially, New Zealand adopted formal inflation targeting (IT) in 1990 following the failure of monetary policy to contain inflation which was higher than the average inflation of the major developed economies with higher variance (Figure 4). Particularly, the failure of monetary aggregate targeting in New Zealand and many other countries emerged due to unstable relationship between the intermediate target (monetary aggregate) and the final target (inflation) (Dodge, 2005). The relationship between monetary aggregates and inflation started weakening mainly due to financial innovation in the mid-1980s (Gregorio, 2004).

The success of New Zealand's experience and major characteristics of IT (flexibility, transparency and accountability) encouraged other countries also to adopt this policy framework. During 1991-95 period, nine other countries adopted IT regime.[6] Interestingly, most of the founder members of IT club were high-income developed countries with historically low inflation rates.

[6] These include Chile, Canada, Israel, UK, Sweden, Finland, Peru, Australia, and Spain.

Figure 5. Chile: CPI Inflation (y/y)

In particular, the achievement of containing inflation in Chile (Figure 5) under flexible IT regime encouraged some other middle-income countries to adopt inflation targeting in the subsequent years. In turn, Korea, Poland, Mexico, Brazil, Columbia, Thailand, Hungary and recently the Philippines adopted inflation targeting.

The important point to note here is that the increasing popularity of IT is not necessarily due to the success stories of IT countries in achieving inflation targets, as some studies conclude that inflation targets are missed about 40 percent of time with significant margins (Roger and Stone, 2005). Instead it is gaining popularity on the basis of its positive attributes (e.g., openness, transparency, accountability, increased credibility, etc.), and importantly non-availability of better alternatives. Inflation targeting is an equally attractive policy option for both developed and developing countries. However, IT is more complicated to operate in emerging markets (particularly more open emerging markets) due to relatively high pass through effect, difficulties in forecasting inflation, liability dollarization and credibility problem (Eichengreen, 2002).

6. Pre-requisites for IT

Explicit inflation targeting requires some pre-conditions. In the following section, a brief evaluation of some of these pre-requisites in the case of Pakistan is presented.

First, the central bank should have at least instrument independence that it can choose the appropriate operational instrument as per the situation. In the case of fiscal dominance, central bank's credibility would be at high risk. Indeed, central bank's independence would also entail corresponding accountability. Second, availability of an appropriate measure of inflation is needed that can be used as a policy variable. The practice of different central banks varies; some central banks target headline inflation, while others prefer to target core inflation.[7] Third, monetary policy transmission mechanism should be well understood. Fourth, central bank should convey its target publicly with increased transparency regarding its policy actions as well as reasonable explanations if target missed or revised. Finally, financial stability, market based exchange rate system and sound macroeconomic fundamentals are some other important elements which help in successful implementation of IT. This section aims to evaluate in terms of these pre-requisites whether the SBP is in a position to adopt IT or not. Following is a brief evaluation of these pre-requisites for IT in the case of Pakistan.

Institutional Set-up

Since the central bank is responsible to achieve inflation target, a considerable degree of independence is required in formulation and conduct of monetary policy. This degree of independence is nonetheless associated with the accountability of the institution. In practice, degree of independence of the central bank varies from country to country. In Pakistan, the State Bank of Pakistan is an autonomous institution and enjoying a comfortable independent status.[8] There could be arguments on the degree of independence, however, as far as the selection of operational instruments, setting monetary targets and related monetary policy issues are concerned, the SBP is largely free from the political influence. However, allocation of the annual target for the government's budgetary borrowing from the

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[7] Core or underlying inflation measure is computed by exclusion method, trimming method or by using some other statistical method(s). The primary reason to compute core inflation is to identify the permanent component and exclusion of the transitory shocks from headline inflation.

[8] This is also acknowledged in IMF's Report on the Observance of Standards and Codes (ROSC), November 2000, available at http://www.imf.org/external/np/rosc/pak/fiscal.htm.

banking system is being done in the Fiscal and Monetary Policies Coordination Board prior to the announcement of the federal budget, generally the government does not breach these targets. Moreover, government's borrowing from the SBP directly contributes to reserve money growth thus making it highly inflationary in nature. The government's access to financing from the central bank makes conduct of monetary policy challenging in two ways: (a) it reduces the central bank's ability to control liquidity; and (b) it also hurts the credibility of the central bank's commitment to contain inflation within a desired range. These are the reasons that government borrowings from the central bank is not in practice in ITers, rather it is restricted through legislative amendment as it has been done in Turkey (TCMB, 2001).

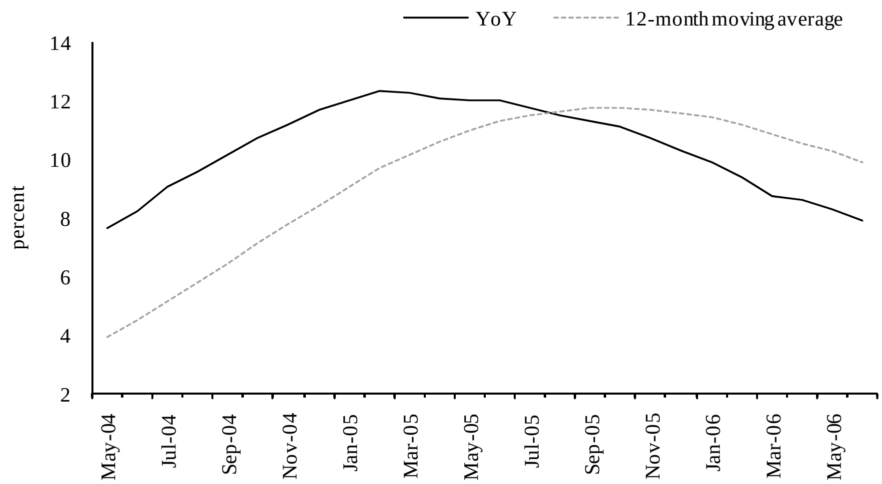
On the other hand, inflation target is initially set by the Planning Commission,[9] which is also discussed in the Fiscal and Monetary Policies Coordination Board for consultation with both the Ministry of Finance and the SBP. Thereafter, National Economic Council, the supreme policy-making body in economic sphere, approves this inflation target with overall Annual Development Plan (Ahmed and Amjad, 1984). In practice, inflation targets in countries with IT are generally set by either ministry of finance or [arliament. However, central bank's consensus is usually obtained in most of these countries as well. In fact, a greater role of the SBP in setting up inflation target would be desirable under IT regime.[10]

At present, the main responsibility of the SBP is described at the preamble of SBP Act 1956 as "*to regulate the monetary and credit system of Pakistan and to foster its growth in the best national interest with a view to securing monetary stability and fuller utilization of the country's productive resources*." This implies that the SBP is responsible to achieve the dual objectives of: (a) fostering economic growth; and (b) maintaining monetary stability (or price stability) in the economy. The objectives of growth and monetary stability could often be conflicting. Therefore, central bank is required to strike a balance between these objectives. However, the multiplicity of objectives may also create a difference of opinion between the government and the central bank about which objective should dominate the monetary policy actions. In this backdrop, an amendment in the SBP Act to have an overriding monetary policy objective of low inflation would enhance its credibility of central bank as inflation fighter.

[9] Vide Govt. of Pakistan Notification No. Cord (I)-8/84/58-I, dated October 22, 1958, the president was pleased to re-designate the National Planning Board as the Planning Commission. Cabinet Division's Resolution No. Cord(I)-8/29/59-III dt. June 3, 1959 defined its objectives including preparation of Annual Plan, which including others, reports targets for inflation and growth.

[10] This assertion is based on the central bank's capability to produce a reliable model-based inflation forecast.

Figure 6. Changes in House Rent Index



An Appropriate Measure of Inflation

Consumer Price Index (CPI) probably fulfills all the requirements to qualify as a benchmark to measure inflation in Pakistan. It has a comprehensive coverage of 374 items under 10 commodity groups, reported for 5 different income groups, based on monthly survey of 71 markets in 35 major urban centers, Sensitive Price Index (SPI) is another price index which is reported on weekly basis and is limited to 53 items only. GDP deflator is the most comprehensive measure of inflation which is available on annual basis.

However, as in the case of other low-income countries, weight of food component in Pakistan's CPI basket is about 40 percent, which is generally less responsive to monetary policy and largely subject to exogenous supply shocks. More importantly, computation methodology of house rent index (HRI) is not survey based. HRI, with dominating weight of 23.43 percent in CPI basket, is computed on the basis of a 24 month moving geometric average of the building material sub-index of Wholesale Price Index (WPI) and construction related wages (SBP, 2004). Since HRI is a 24-month geometric mean, the changes in HRI on year-on-year or 12-month moving average basis generate a smooth upward or downward trend (Figure 6). Therefore, the impact of policy shocks gets muted in HRI.

Importantly, compilation of non-food non-energy based core inflation excludes about 49 percent of the CPI. Further, prices of various other items are largely influenced due to changes in international prices (such as construction material – part of HRI). In addition, the role of administered prices (particularly in determination of transport fares) cannot be ruled out. A comparison of CPI basket of selected countries reveals (Table 6**)** that food group's weight in Pakistan is though higher than the UK and New Zealand, it is significantly lower than other developing countries. However, weight of housing is the highest in Pakistan. This coupled with methodological issues mentioned above suggests that the computation methodology of house rent index is probably the most important element for improving the price statistics in Pakistan.

CPI could potentially serve as a representative indicator for inflation. However, a survey-based HRI, rationalization of its weight according to the latest income-expenditure survey and enhanced coverage of both manufactured items and cities are some necessary requirements to make CPI a truly representative indicator of inflation in Pakistan.

Resources Required

Although a sophisticated macro-econometric model is not a necessary condition for IT, it is nonetheless important from operational and communication point of view. A monthly or quarterly model-based forecast can provide sound arguments regarding pro-active monetary policy. Moreover, publication of model-based forecasts establishes credibility about the working and policy formulation process in the central bank.

The SBP has invested heavily to develop its human resources during the last few years. As a result, the SBP staff is capable to develop econometric models. It is also evident from regular publication of SBP forecast of major macroeconomic variables in annual and quarterly reports. Similarly, publication of Monetary Policy Statement (MPS) is an attempt to announce its policy stance which also improves the SBP communication with the general public, financial markets and media. The SBP also initiated the publication of "Inflation Monitor" on monthly basis, since 2005, describing price statistics in detail.

In case of adoption of IT, the SBP has to further improve communication to create more transparency through; (a) publication of minutes of the Monetary Policy Committee (MPC); and (b) improve the status of present publication "Inflation Monitor" into an "Inflation Report", at least on quarterly basis.

Table 6. Consumer Price Index Basket: Weights of Different Groups

Percent

Country	Pakistan	New Zealand	UK	Philippines	India[1]	Bangladesh
Base year	2000-01	June 2006 quarter	2006	2000	2001	1995-96
Food, beverages & tobacco	40.34	24.58	14.60	50.03	60.15	58.84
Non-food	59.66	75.42	85.40	49.97	39.85	41.16
Clothing & footwear	6.10	4.75	6.50	3.00	8.54	6.85[2]
Housing (rent, repair, utilities etc.)	23.43	20.02	10.80	16.80	8.67	16.87
Household contents & services	3.29	5.49	7.30			2.67
Transport & communication	7.32	20.50	18.00			4.17
Fuel & light	7.29			6.95	6.28	
Recreation, education, culture	4.28	12.29	16.40			4.13
Health	2.07	5.23	2.40			2.84
Restaurant & hotel			13.40			
Services	5.88			15.89		
Miscellaneous		7.13	10.60	7.33	16.36	3.63

[1] CPI for industrial workers, the WPI serves as headline inflation in India.

[2] Including fuel & light.

Some Constraints

Non-availability of national income data on quarterly basis is probably the major constraint in doing a meaningful analysis and effective monitoring of key macroeconomic variables. Also, delay in availability of statistics on *large-scale manufacturing*, *trade* and *agriculture,* frequent revisions in data released by the Statistics Division, Government of Pakistan reduces the usefulness of the available information. It is quite difficult to improve the policy making process without any improvement in the quality and timeliness of the statistics. It should also be kept in mind that key policy decisions on the basis of poor quality of available information may easily go in wrong direction. Indeed, this situation poses threat for SBP’s credibility that inflation target could be missed due to inadequate or incorrect information. The fact that the impact of monetary policy action appears with time lags through different transmission channels, the issue of timeliness and accuracy of information becomes more important.

Understanding Monetary Policy Transmission Mechanism

Understanding transmission mechanism is important for the conduct and implementation of monetary policy to achieve specific inflation target (range) as a primary responsibility. There are several issues on the right channel and magnitude of monetary policy transmission mechanism in many developing and developed countries. Little empirical research has been done on this subject in Pakistan. Ahmed et al. (2005) did some pioneering work on monetary policy transmission mechanism. However, their estimates are based on historical time series and probably do not represent the present scenario due to a rapid structural transformation in the economy during the last 15 years, particularly in the financial sector. However, adoption of IT even without comprehensive knowledge of transmission mechanism is not too dangerous, for example, when Reserve Bank of New Zealand adopted IT, it had no clear understanding about the transmission mechanism and their macro-econometric model was inadequate (Brash, 2002). This suggests that IT could be adopted even without a complete and clear understanding of transmission mechanism.

7. Conclusion

The above discussion reveals some interesting conclusions:

1) The most important finding of this paper is that monetary aggregate targeting is no more appropriate for Pakistan because of an unstable money demand function. This is also reflected from the performance in recent years when actual monetary expansion surpassed the targets (or revised targets) with wide margins.

2) Though CPI basket in Pakistan seems adequate to depict trends in headline inflation, it could be improved further by; (a) incorporating survey-based HRI; and (b) revisiting the weights as per contemporaneous income-expenditure trend. An improvement in price statistics would facilitate the SBP to get better forecast and assess policy impact on inflation, which is necessary to ensure the credibility of the monetary policy.

3) Availability of quarterly national income accounts data in addition to quality and timeliness of data on key macroeconomic variables appear to be major constraints in effective policy making process in Pakistan.

4) A change in legal/legislative framework is required to enable SBP to focus on a single objective of price stability rather than dual mandate of supporting growth and price stability.

Before opting for IT, the SBP could adopt "Inflation Targeting Lite" as this practice remains popular among emerging market economies after success in Chile, Peru and Turkey. The IT Lite is also recommended for Pakistan by Zaidi (2005), and Khalid (2005). In addition, as with many other ITers, SBP may also keep a relatively wide range of inflation target (e.g., 1 percent above and 1 percent below the mid-point target) for a medium term horizon during its initial period of practicing IT.

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Comments

The study proposes the State Bank of Pakistan (SBP) the central bank switching from existing regime (i.e., monetary aggregates targeting) to an alternative strategy of monetary policy. It assesses two relevant issues having significant posture for the conduct of monetary policy in Pakistan. First, the stability of money demand function is checked, which is considered an important pre-condition for the success of monetary aggregates targeting regime. Significant structural changes in Pak economy & its financial sector, the resultant financial innovations, and increased usage of information technology appears to have caused weakening of relationship between inflation and monetary aggregate (M2). Upon finding the element of instability in the said function, it casts doubt on the suitability of the current strategy, considering it inappropriate for Pakistan. Second, it explores the possibility of the SBP's switching towards alternative strategies of monetary policy including inflation targeting (IT). While considering IT regime relatively a better option, it discusses briefly the status of pre-requisites in the context of Pakistan. Since certain important pre-requisites of IT are still lacking here (e.g., availability of an appropriate measure of inflation, lacking in terms of high frequency data on key macroeconomic variables, non-existence of required legal/legislative framework mainly to target an overriding objective of price stability), it suggests for adoption of "IT Lite" as a transitory regime under the prevailing circumstances.

In recent times, a considerable research work has been done on exploring the different aspects of monetary policy strategies of central banks around the globe. The current study is also a noteworthy addition to existing knowledge base in the context of Pakistan by assessing the suitability, or otherwise, of its prevailing monetary policy framework. In fact, the subject matter is of topical importance which calls for attention of experts for detailed analysis. It is important because the pursuance of an inappropriate monetary policy regime, if any, can bring about serious implications for Pak economy, in general, and financial sector, in particular. When seen against the above backdrop, the research initiative by the author on the subject issue deserves appreciation. However, there is room for improvement which can be filled somewhat by incorporating the following comments/suggestions:

1) The study informs at the outset that "presently, the SBP is pursuing monetary aggregate targeting." It would have been more appropriate to briefly dwell upon some historical perspective as Pakistan has a valuable experience of remaining under different monetary policy arrangements during recent past.

2) The central banks desirous of pursuing monetary aggregates targeting regime need to fulfill three important conditions for success in their policies which include: a) the stability of money demand function; b) having adequate control over its liabilities (i.e., reserve money); and c) stability of money multiplier. The study under review discards the suitability of monetary targeting regime (which has been presumed to be followed by SBP) exclusively on account of instability of money demand function whereas other two pre-conditions have been left untouched; leaving sufficient room for further analysis of the issue. Moreover, the estimation of money supply function would be helpful in strengthening the arguments concerning the need for an alternate monetary policy regime for Pakistan, if any.

3) The existing literature provides mixed evidence concerning the stability of money demand function in the context of Pakistan. While studies such as Hossain (1994) could not provide evidence on stability of the said function even before financial liberalization in Pakistan, there are studies[11] including Khan et al. (2000) which find a stable money demand function, capturing the period when most of the financial sector reforms were undertaken in Pakistan. This indicates desirability of further debate on the issue of stability of money demand function for Pakistan.

4) The study explains on page 5 that "a simple money demand function has been estimated with cointegration technique to avoid spurious regression." This explanation about cointegration technique is not enough. Rather, it should explain the cointegration procedure being followed by the study with appropriate references. This is essential to avoid any confusion as various cointegration techniques are available in the literature including cointegration procedure suggested by Johansen (1988, 1991).

5) The recent literature pays more attention to the robustness of regression estimates, which affect severely due to presence of structural break(s) in time series data. Especially, the literature reports that ignoring structural break(s) in data series may lead to model misspecification problem, spurious statistical inference, and consequently to wrong conclusions. However, the study under review ignores the complications while analyzing stochastic behavior of data set, which may arise due to presence of structural break(s) in data. Particularly, if the data series is stationary around a deterministic trend with structural break(s), there is likelihood to accept the null of a unit root even if a trend is included in the Augmented Dickey Fuller (ADF) regression. Also there is a similar loss of power in the unit root tests if the said data series exhibit a shift in intercept. However, if structural breaks in data are known, the ADF test can

[11] For details, see Qayyum (2005).

be adjusted by including dummy variables in the ADF regression[12]. As regards information on structural break(s) in data series, it is rarely directly observable. To identify timings of potential break(s) and their role in creating instability, various techniques are suggested in the literature[13]. Instead of relying on data trends only, the study may use appropriate procedure for identifying structural break(s) and their positioning.

6) The study mentions that since “the error term of estimated equation is found to be stationary, which implies that these variables are co-integrated.” (page-5) This suggests that the study uses standard procedure of co-integration put forth by Engle and Granger (1987). However, it has not given any reference of the cointegration method before explaining the above result.

7) With regard to employing cointegration techniques in the presence of structural breaks, there is substantial literature on the subject issue which reveals adverse implications of structural breaks on robustness of cointegration estimates[14]. This is important as the study mentions at page 6 that “the latter test suggest structural break in 1991”, which makes the results skeptical.

8) The study indicates that financial innovations are one of the key factors behind instability of money demand function in Pakistan. However, neither it gives detail of any financial innovations in Pakistan which emerged as result of financial liberalization nor explains channels through which the innovations caused weakening of relationship between inflation and money supply.

9) Sometimes, the impact of financial innovations is not captured by M1 or M2 aggregates. For this purpose, economic literature suggests for developing a divisa of monetary aggregates which is considered a best solution when financial innovations are taking place in an economy. This monetary variable can also be developed for Pakistan. Most probably, the issue of weakening of money-price relationship would be resolved by replacing M2 with divisa of monetary aggregates.

10) As regards discussions relating to regime switching options available with the SBP, the study discards those for exchange rate targeting, nominal income targeting, and interest rate targeting without estimating regime specific reaction functions for it. Particularly, it should estimate such a function for

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[12] For details, see the studies by Perron (1989) and Zivot and Andrews (1992).

[13] Bai and Perron (1998) method is used to identify the break points and their position. Hamilton’s (1994) Markov Switching Model can also be helpful in identifying the structural breaks.

[14] For details, see Noriega and Daniel (2006).

interest rate targeting regime, as the SBP appears to have been responding to market developments using its key policy rate since January 2003.

11) At page 16, the study mentions that "the SBP has to further improve communication to create more transparency through publication of minutes of the Monetary Policy Committee (MPC)" without explaining its role and legal status in decision making process of the SBP.

12) In equation No. 3.2 on page 7, the + sign before the coefficient of dummy variable 91 (i.e. -4.43 (D91) should be removed.

13) The study should indicate somewhere in the text (preferably in abstract/data description in methodology) both the period of analysis as well as frequency of data used for empirical research work. The study should also give data sources of figure 4, 5, and 6. The data source of Table 6 is not given. In fact, it has been observed that the study describes various important developments without giving proper references of studies/papers/reports, etc. Similarly, it uses Augmented Dickey Fuller (ADF), CUSUM, CUSUM squares, and Chow break-point tests without citing reference(s) of the original studies. Giving adequate references of the developments in the study is supposed to improve its quality.

Manzoor Hussain Malik
Joint Director, RD
State Bank of Pakistan

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Comments

On the basis of its empirical findings that money demand function for Pakistan has been unstable, this paper argues that the existing regime of monetary aggregate targeting is inappropriate. While exploring alternative monetary policy regimes, the paper suggests inflation targeting as a possible choice. However due to some practical constraints, such as non-availability of national income data on quarterly basis, need for improvement in price statistics, the paper suggests IT-Lite as a potential arrangement for pursuing monetary policy objectives. The author deserves appreciation for raising an important debate on the choice of monetary policy framework in Pakistan. I have the following comments:

1) The paper claims that the money demand function is unstable, yet it establishes the presence of cointegrating relationship between real money balances, income and opportunity cost variable for the period 1974-2006. The two findings are contradictory.

2) The conclusion that money demand function is unstable is based on the existence of structural breaks during 1974-1990 and 1991-2006. It may be noted here that a relationship can be stable even in the presence of structural breaks.

3) The paper attributes the structural shift in intercept to a gradual and steady monetization in the economy. First, this view does not follow the result. Second, one should note that the degree of monetization may itself be a function of financial innovation.

4) The choice of monetary policy regime must be based on some objective criterion. This criterion should allow us to determine a regime that provides superior conditions for achieving monetary policy objectives. The appropriateness of a particular monetary policy regime can also be analyzed in terms of its performance under different macroeconomic shocks (e.g., shock to aggregate demand, productivity). The author has evaluated various options for monetary policy framework (such as exchange rate, nominal income, and interest rate targeting) without comparing their relative performance or subjecting them to any objective criterion. Similarly, the suggestion by the author that the SBP should adopt 'IT-Lite' as monetary arrangement has been made without formally establishing that 'IT-Lite' would provide superior conditions for achieving monetary policy objectives.

Syed Sajid Ali
Joint Director, EAD
State Bank of Pakistan