Measuring Central Bank Independence in Twenty- Five countries: A New Index of Institutional Quality

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Abstract

Nowadays, it is widely believed that a high degree of Central Bank Independence (CBI) coupled with some explicit mandate for the Central Bank (CB) to restrain inflation is an important institutional device to assure price stability. This paper mainly tries to construct a new index for measuring CBI in twenty-five selected countries and examines the characteristics of the proposed linkage between CBI and inflation. Analysis shows the existence of a negative association between CBI and inflation, which is consistent with the theory. The new CBI index offers a strong model for optimal implementation and sequencing of CB reforms in emerging market economies, including India.

I

Introduction

Central Bank Independence (CBI) is an important institution that structure the relationship between the Central bank (CB) and the Government relating to such aspects like CB's appointment procedures, monetary policy and lending to the government. Theoretical and empirical literature shows a significant negative association between the CBI and inflation. It is assumed here that the formal delegation of monetary policy to an autonomous CB would insulate it from electoral and partisan political pressures so as to enable the CB to better achieve its objective of price stability. Hence it is very important to broadly define and quantify CBI to optimally sequence and implement central bank reforms in many emerging market economies. This would also facilitate a superior analysis of the characteristics of the proposed link between CBI and price stability in different countries.

Few Economists have tried to measure or quantify CBI. However, most of them have focused on legal or formal or *de-jure* independence as opposed to actual or informal independence since it is difficult to quantify such factors like informal arrangements and evolved norms of CB relationship with the government. These legal indices of CBI were not used to measure level of independence of CBs in the 1990s, despite major changes in the institutional rules and practices of CBs in many countries. Furthermore, these indices are very narrowly defined so that it fails to capture clearly all the determinants of CBI. Hence this

study attempts to fill these gaps by developing a broad and new actual or *de-facto* index for CBI, which takes into account the new data of 25 CBs on not only CB laws but also their actual practices and evolved norms of behaviour. The main data sources are statutes, annual reports, website information and other publications of CBs.

The main objective of this study is to construct a new index for Central Bank Independence and to use this index to measure CBI for twenty-five selected countries. The paper also tries to examine the linkage between CBI and inflation. The rest of the paper is organised as follows: section 2 provides the evolution of monetary policy regimes and defines Central Bank Independence and credibility; section 3 provides a comprehensive and critical review of theoretical literature on CBI and discuss various existing indices of CBI. The fourth section, which forms the core part of this paper, presents the new index of CBI after discussing the economic rationale behind using various criteria and weights to measure this index. This section also uses the new index to numerically measure CBI in twenty-five selected countries and examines the association between the calculated values of CBI and inflation for these countries. The final section gives summary, policy implications, and concluding remarks.

II

Evolution of Monetary Policy Regimes and Central Bank Independence

1. Institutions for Price Stability

Governments all over the world conduct monetary policy, typically via., specialized agencies called CBs or monetary authorities. The earliest monetary authorities were established to provide financing for the government and to help develop the financial system by ensuring order to the note issue. As the practice of central banking evolved over the 19th century, the CB took the ultimate responsibility of protecting the stability of the financial system and the external value of the currency. The new central banking legislation enacted in the aftermath of the great depression in the 1930s incorporated both monetary stability and the promotion of full employment. Later, as the inflationary pressures gathered momentum in the 1960s and with the inevitable collapse of the Bretton Woods system in 1972, the focus of monetary policy shifted to the maintenance of domestic value of currency - price stability. This found expression in a new rule called monetary targeting, which came into prominence in the late

1970s and early 80s under the influence of the theoretical and empirical work done by Friedman and Schwartz (1963).

However, by the late 80s, this new intermediate targeting faded into oblivion when many countries (except Germany and Switzerland) started exhibiting substantial instability in the demand for money under the influence of financial liberalization and innovation on conceptual money-income relationship. The breaking down of Money multiplier approach and the effect of volatile cross-border capital flows worsened the situation. Since then, there emerged a renewed interest in increased flexibility in the conduct of monetary management, a framework based on broader set of information variables to guide the actions of monetary authorities. Countries that were successful in maintaining low inflation have typically enjoyed better economic performance than countries that were unable to control inflation. This prompted the many CBs to consider price stability as the principal and over-riding objective of monetary policy. Furthermore, the new view about the role of government and the desire to promote sustainable growth within a market economy brought about renewed interest in the institutional conditions necessary for price stability.

Therefore the question before policy-makers is, what alternative institutions – legislations, norms and practices - need to be designed and adapted in order to bring about the objective of lower inflation. By this time, academic economists and practical central bankers alike got inspired by the success of autonomous Bundesbank, the German CB, and this was taken as the main evidence that greater CBI could function as an effective institutional device for assuring price stability.

Theoretical work on monetary policy has started focusing on deriving the characteristics of the negative link between CBI and inflation (Rogoff, 1985; Lohmann, 1992; Walsh, 1993; Debelle and Fischer, 1994; Svensson, 1997; Bernanke et. al, 1999; Mishkin et. al, 2001). The notion of transparency and accountability was also a part of this new institutional scheme to fill the democratic deficit of an independent CB and to ensure better co-ordination of monetary policy and fiscal policy. Empirical work by Bade and Parkin (1988) and Alesina (1988), have found a negative relationship between the average rate of inflation and the CBI, especially for developed countries.

This interesting finding was integrated into the practice of central banking by the Reserve Bank of New Zealand in 1989.The central banking law in New Zealand was

reformed and the bank adopted a new institutional framework for monetary policy in 1989 called inflation targeting, which integrated CBI, transparency and accountability in an ideal form. Later, the new European Central Bank (ECB) and the CBs of European Union countries embraced full independence with price stability as its main objective to keep distance from the governments and political pressures. This process heightened the official interest in CBI besides the awareness and familiarity of the public with the topic.

From 1989 to the present, around 35 CB laws were revised or rewritten, and all in one direction, namely strengthening the independence of the CB. It is true about the industrial countries, Latin American countries, East European countries and finally the East Asian countries.

India is no exception to these developments. The historic agreement in 1994 between the Government of India and the Reserve Bank of India (RBI) on the termination of the system of automatic monetisation of the fiscal deficit (adhoc treasury bills) from 1997 and the introduction of a system of *Ways and Means Advances* constitutes an important milestone in the history of Indian public policy.

Secondly, the tabling and passing of the *Fiscal Responsibility and Budget Management Legislation (FRBM Act 2003)*, which aims at the medium-term management of the fiscal deficit, revenue deficit and prohibition of CB lending to the government, greatly adds to RBI's independence from the fiscal authority. FRBM Act also seeks to prohibit RBI support of Government securities in the primary market from April 1st 2006, which signals initiatives for separation of government debt management function from monetary policy The objective of the legislation is to impose fiscal discipline on government spending and ensure a transparent and accountable fiscal system, which is crucial for CBI.

Another important development was the co-ordinated endeavour of the Government of India and the RBI to consider the implementation of International Financial Standards and Codes on fiscal, monetary and financial policies[1]. The issues of transparency and accountability governing their operations with each other have been addressed by Advisory Groups on *Transparency in Monetary and Financial Policies*[2] in the year 2000 and on *Fiscal Transparency* in the year 2001. They have suggested some important institutional changes in the operational conduct of monetary and fiscal policies and highlighted the need for better coordination between them, which are in different stages of implementation. There are also

some important initiatives proposed in the Union Budget for 2005-06 for scrapping the minimum limit set for SLR and CRR by amending the RBI Act and the Banking Regulation Act. All these important initiatives are going to take RBI to greater Independence.

2. Definition of CBI

CBI relates to three areas in which the influence of the government must be either excluded or drastically curtailed: independence in personnel, financial and policy matters. A CB is said to have Personnel Independence or Political Independence (PI), if the influence of the government is partially or fully excluded from CB's appointment procedures. The degree of such independence may be determined by factors like government influence in appointment procedures, terms of office, and dismissal of the governing board of the CB.

The degree of Financial Independence or Fiscal Independence (FI) is determined by the extent to which the CB can exclude government from direct and indirect access to CB credits. Here the direct credit arises when CB allows monetization of the fiscal deficit and indirect credit when the CB participates in the management of government debt in the primary market. Direct credit also takes the form of securitized lending, when backed by negotiable securities; and non-securitized, when not backed by negotiable securities.

Monetary Policy Independence (MPI) refers to the flexibility given to the CB in the formulation and execution of monetary policy. Debelle and Fisher (1994) distinguished between independence with respect to both goals and instruments. A CB is said to have goal independence, if it has complete discretion in setting the ultimate goals of monetary policy, like inflation, unemployment, or economic growth. European CB exhibits this kind of independence. A few CBs have their goals jointly set by the government and the CB (Australia, Canada, Mexico, New Zealand etc.). Majority of the CBs in the world have no goal independence, since the government sets the goals. A CB has instrument independence if it is free to choose the means (instruments) to achieve its goals; it is not independent in this regard if it requires government approval to use policy instruments.

3. Credibility, Reputation and Central Bank Independence

One of the important assets of a CB is its credibility. Credibility can be defined as the ability to consistently match deeds to words. It is the institution arising from the reputation[3] generated by the history of honesty in matching achievements with announced objectives or targets. Reputation is an important precondition for the adoption of medium or long-term

approach to economic policy. This can be provided only if the CB is granted strong independence, otherwise the policy becomes too narrowly focussed on the short-term results in inflationary bias.

The new style of economic policy has shifted away from the way of surprising markets to that of incessant and effective communication with the markets, With credibility, announcements on policy intentions reinforce actual policy measures and impact on market expectations and, thereby, speed up the transmission mechanism of monetary policy. Thus, credibility is a costless institution (a first best solution) that enhances the effectiveness of monetary policy and CBI enhances credibility.

III. Survey of literature

1. Origins of Inflationary Bias and Arguments for Central Bank Independence

Nowadays, it is widely believed that a high degree of CBI coupled with some explicit mandate for the CB to restrain inflation is an important institutional device to assure price stability. The theoretical literature provides three different explanations for the negative association between CBI and inflation: public-choice arguments; the analysis of Sargent and Wallace (1981); and the time-inconsistency problem of monetary policy.

Public choice theorists like Buchanan and Wagner (1977) view that CBs are subjected to strong political pressures to fall in line with government preferences and objectives. A contractionary monetary policy response worsens the government's fiscal position, since the consequent economic slow down reduces revenue from taxes and seigniorage, and increases interest burden on public debt. The government may therefore naturally prefer monetary expansion over contraction, which results in high inflationary outcomes or inflationary bias.

The more influential the government is in appointment procedures of a CB Board and the Governor, the more likely that the CB acts in accordance with government preferences. Hence lower CBI could end in inflationary bias. Some evidence to supports these arguments based on tests to determine whether monetary policy turns expansive before elections – as predicted by the theory of political business cycle[4] (Nordhaus 1975; Alesina, 1988) – or diverges under administrations with different political ideology as predicted by partisan theory[5] (Hibbs, 1977; Alesina, 1988).

A second argument that independent CBs could deliver lower inflation had been first put forward by Sargent and Wallace (1981), They discuss about two coordination schemes, one in which fiscal authorities dominate over monetary authorities and the other in which the latter dominate the former. If fiscal authorities dominate over monetary authorities, the latter will be forced to finance fiscal deficit by printing money, provided the market is reluctant to absorb additional government bonds. If however, monetary authorities are dominant, fiscal authorities will be forced to reduce the deficit or repudiate part of debt, leading to lower inflation tax. Therefore highly independent CBs are insulated against the uncontrolled monetisation of fiscal deficit. This argument relates to financial independence or fiscal independence.

A third, and the most prominent, argument for CBI is based on the time- inconsistency problem (Kydland and Prescott, 1977; Barro and Gordon, 1983). Time-inconsistency or dynamic-inconsistency arises when the best plan currently made for some future period is no longer optimal when that period actually starts, and so that the policy maker re-adjusts and deviates from the pre-announced path.

In the context of monetary policy, the time inconsistency problem arises because there are incentives for a politically motivated policymaker to try to exploit the short-run trade-off between unemployment and inflation. But under rational expectations, such a game between economic agents and the policy maker would make the outcome of time consistent policy sub-optimal, since it includes an inflationary bias - a higher inflation with the unemployment remaining the same, even in the short-run. Hence, it is argued that CB should be made independent of the government, so as to ensure credible pre-commitment to policy targets. In this way, the inflationary bias of monetary policy is removed.

The episodes of high inflation during the 1960's and 1970's in most industrial countries are regarded as the prime evidence for the existence of inflationary bias in the conduct of monetary policy. More CBI has the potential to reduce the incentives for inflationary bias. The tendency of CBs to show inflationary bias arises from four broad motives: (a) fiscal motive – monetary financing of fiscal deficit (seigniorage or inflation tax) and reducing the real value of government debt (b) output or employment motive – increasing output at the expense of surprise inflation by exploiting the short-term Phillips curve (c) balance of payments motive – effecting Surprise devaluation to promote exports in the short-

run, though not effective in the long-run and (d) financial Stability motive – tendency to avert financial instability by expansionary interest rate policy, at the cost of higher inflation.

2. Institutional Solutions for Inflationary Bias

Recent theoretical literature deals with four approaches on cures or solutions for the inflationary bias of discretionary monetary policy: (a) Rules (b) conservative central banker (c) principal-agent contracts and (d) inflation targeting.

(a) Rule- based regime

Kydland and Prescott (1977) and Barro and Gordon (1983) argued strongly for enforceable or credible monetary rules to eliminate the problems of dynamic inconsistency and the consequent inflationary bias of discretionary monetary policy. The idea here is to set target for a intermediate variable (money, exchange rate) or ultimate variable (inflation), in such a way that the marginal benefits of achieving the target is equal marginal benefits of reneging on the target. A number of countries have successfully achieved price stability by adopting rule-based frameworks like monetary targeting, fixed exchange rates system or currency board system.

(b) Conservative Central Banker Approach

Rogoff (1985) proposes the appointment of a conservative central banker[6], whose preference for price stability relative to economic growth is stronger than that of society. The implication is that when confronted with a difficult choice between inflation and economic growth, the government prefers the latter and the conservative central banker opts for the former, the socially optimal inflation. Here CB's preferences prevail over, since Rogoff's central banker has both goal and instrument independence. The German CB, the Bundesbank, was a conservative CB with both goal and instrument independence.

Despite its advantages, the Rogoff conceptual model exhibits higher variability in real economic growth (due to supply shocks) and employment than in the rule-based framework with time inconsistency. Nevertheless, Rogoff model makes society better off, since it is expected that gains from lower inflation exceeds losses from decreased output stability. Lohmann (1992) introduces the possibility of overriding the conservative central banker at a strictly positive but finite cost, but in equilibrium the central bankers will not be overridden since society will be indifferent between overriding or not, even in the case of an extreme

productivity shock. The resulting equilibrium is better than that of Rogoff, since it ensures optimal output stabilization as well in the event of supply shocks.

(c) Principal-Agent Contract[7]

Walsh (1993,) suggests an alternative monetary policy strategy in which, both price stability and output stabilization can be achieved optimaly . This approach deals with the institutional re-design of monetary authorities in the form of a well-structured, optimal contract between the CB and the government with former as the agent and the latter as the principal. Here, the CB is assumed to have greater information and expertise than the government in the conduct of monetary policy, but both have the same preferences (objective function). The CB faces an incentive compatibility constraint in the form of an ex-post penalty schedule that is linear in inflation. The adoption of such practices, which improve transparency, and accountability of the terms of contract would make the performance of the system under constant scrutiny and evaluation of the market forces, which in-turn enhances anti-inflation credibility.

(d) Inflation Targeting as an Institutional Framework for Monetary Policy

Inflation Targeting is a modified version of Optimal contract strategy, a form of constrained discretion, which contains a range of optimal combinations of central bank accountability and Independence. Within this broad framework, adoption of appropriate trade off between independence and accountability has to be arrived at after considering the special features of different economies. It is Persson and Tabellini (1993) who first discusses this targeting strategy, albeit in a crude form, in which the government imposes on the CB an explicit inflation target and make the Bank explicitly accountable for meeting their target. Svensson (1997) suggests a variant of this in which the government sets a goal for socially optimal rate of inflation and delegates the authority to achieve this goal to an instrument independent CB.

Later this monetary policy framework got popularized through the writings of Mishkin (1999) and Bernanke et. al. 1999). Inflation Targeting regime [8] is comprised of five main elements: public announcement of medium term numerical target, point or range, for inflation; an institutional commitment to price stability as the primary and overriding, long term goal of monetary policy; an information inclusive strategy in which many variables are used for deciding the setting of policy instruments; increased transparency through communication with the public and markets about the plans and objectives of monetary authorities; and increased accountability of the CB for attaining its inflation objectives (Mishkin, 2000a).

A strong institutional commitment to price stability as the predominant objective of monetary policy and giving the CB the mandate to do so, is a prerequisite for the success of inflation targeting. This device of institutional commitment entails legislative support for an independent CB whose charter ought to contain provisions for high levels of personnel independence, fiscal independence and instrument independence.

3. Existing indices of CBI

There are four widely used indices or measures of legal independence as developed by Alesina (1988, 1989); Grilli, Masciandaro and Tabellini (1991); Eijffinger and Schaling (1993); and Cukierman (1992) respectively. Alesina modifies the legal independence index made by Bade and Parkin (1988). All these indices of legal CBI exhibit inverse and significant relation with inflation in industrial countries but not in developing countries. In developing counties, the actual practices or norms in central banking may not replicate the central banking law, contrary to the case of developed countries.

IV. A New Index For Central Bank Independence

1. Economic rationale for an Independent Central Bank

An analytical discussion of the economic rationale for an independent CB helps us to broadly redefine the determinants of CBI and provide the logic behind using various criteria and weights to measure the new index of CBI. This is implicit in the following guidelines on key institutional features of CBs.

(a) Objectives

Theoretical and empirical studies on the optimal objective function of monetary authorities reveal that monetary policy is more effective when price stability is adopted in practice as the main and dominant, long-run objective of monetary policy. Both the theoretical economists and the practical central bankers strongly believe that price stability is the best contribution monetary policy can make to balanced, sustainable growth[9]. Furthermore, overemphasis of monetary policy on growth and employment objectives leads to sub-optimal economic outcomes, since monetary expansions are neutral in its real effects and only breed inflation in the long run[10]. The implication of this discussion is that CB should be highly conservative, so that it gains more policy independence in setting the objectives.

(b) Targets

Once the objective is determined, a specific or range target has to be set directly for inflation or indirectly for intermediate or related variables like exchange rate, interest rate or monetary aggregates. These targets may be set by the CB (goal independence); or jointly set by the Government and the CB through a policy targets agreement. When CB sets the targets, it gains more independence, since it avoids the possibility of the government setting a high and sub optimal inflation target to serve political ends.

(c) Instruments

A CB should have authority to determine and operate its instruments like open market operations, bank rate or discount window operations, CRR, short term interest rates etc to achieve its target, without interference from the Government. This instrument independence[11] will insulate the monetary policy from the influence of political motives.

(d) Conflict Resolution

A clear and transparent process should be established to resolve any policy conflict between the CB and the Government. Some of the aspects like Government representation in the bank board, its power to nominate, appoint, confirm or dismiss the bank Governor and the Board members, its capacity to direct or overrule the CB, non-compliance with standards of fiscal responsibility etc. represent potential channels for conflicts and its resolution. It is desirable to constrain the opportunistic and partisan use of such power[12], (unless the economic situation warrants doing so) to strike an optimal trade-off between CBI and democratic accountability.

(e) Exchange Rate Policy

CBs should have freedom to ensure consistency between the exchange rate and monetary policy. If exchange rate policy is not solely the responsibility of the CB, the bank should nevertheless have sufficient authority to implement monetary policy within the constraint of exchange rate policy, and should be the main advisor on exchange rate policy issues. **(f) Institutional Separation of Monetary Policy and Banking Supervision**

The institutional undertaking of the banking supervisory function has an important bearing on the level of CBI, according to the literature on central banking. Institutional separation of monetary policy and banking supervision in two different institutions is pointed out as a pre-condition for enhancing CBI. Few Studies (Goodhart and Schoenmaker, 1995) on this issue

show that, those countries with this institutional separation exhibit lower levels of inflation as compared to countries that have function of monetary policy and banking supervision combined in a single institution like CB.

The first argument in favour of separating financial supervision and conduct of monetary policy is the possibility of a conflict of interest in having a single institution manage both activities. A CB that is vested with both responsibilities might be tempted to rectify financial sector failures by allowing lower interest rates or higher money growth than would be desirable from the perspective of price stability. A second rationale for institutional separation arises from the bad publicity and the confidence crisis attached to financial failures or rescue operations by the CB, with the resulting loss of reputation and credibility of monetary policy. Hence separation of these responsibilities gives CBs more independence and the actual practice in many countries is towards institutional separation.

(g) Political Independence - Appointment, Terms of Office, and Dismissal of the Governor and The Board

Nomination, appointment, confirmation and dismissal of the Governor and the Board should be by separate bodies to provide some measure of balance and freedom. The term should be longer than the election cycle (normally five years) of the Government. Dismissal should be only for breaches of qualification requirements, or misconduct; lack of performance in terms of stated objectives and targets. The board should include a majority of non-executive, non-Government directors.

(h) Fiscal independence or Financial Independence

Independence of CB in fiscal or financial matters relates to formal or informal freedom to restrict CB credit to the Government. Direct credit to the Government should be carefully restricted, if not completely prohibited, to what is consistent with monetary policy objectives and targets. CB loans, if allowed, should be temporary; should be explicitly limited to a small percentage of government revenue; should carry market-related interest rates; should be securitized by negotiable securities. Furthermore, CB should not underwrite and participate as a buyer in primary market for Government securities (indirect credit). As a debt manager the CB wishes to minimize the cost of raising debt and is therefore often tempted to pick up substantial amounts of government securities to avoid increase in interest rates. CB should be

able to independently determine the trade-off between risking monetary expansion and tolerating high interest rates.

Evidence suggests that the more a government exploit the country's financial system to finance its deficit, the less independent will be the CB. The fiscal dominance hypothesis holds that both the magnitude of the Government deficit and the methods by which it is financed determine CBI[13]

2. Methodology for the Construction of New Index for Central Bank Independence

The new index[14] of CBI is constructed as a sum of the numerical values assigned to eighteen institutional attributes (both in law and practice) of CBs: six attributes each for Monetary Policy Independence (MPI); Personnel or Political Independence (PI); and Fiscal or Financial Independence (FI). These three groups, MPI, PI, and FI, take a maximum value of 12 each and gives a maximum aggregated value of 36 for the new index of CBI. This index can also be called a weighted index of CBI with a scale[15] of 0-36, since attributes are weighted unequally.

This index is better called as an actual or *de-facto* index rather than a legal or *de-jure* index, because the aggregated value is based on the actual institutional practices (norms) of the CBs and not necessarily what is written in CB law. Hence my index is an interpretation of CBI based on those laws, which are put to actual practice and those practices that are not in law.

Eighteen attributes or criteria used for constructing the new index for CBI and the possible scores attached to sub groups of each criterion are defined. CBs under study belong to either one of the subgroups of each criterion. The score assigned to each criterion is aggregated to obtain the value of CBI. Higher the value assigned to each criterion, higher will be the CBI. They are as follows:

A. Monetary Policy Independence (MPI)

A1. The degree of conservativeness of the CB or Independence in setting effective objectives

(a) The objective of monetary policy is only price stability or price stability is the principal and overriding, long run goal of monetary policy (*3 points*).

(b) The objective of monetary policy includes price stability and other aspects like financial stability-both exchange rate stability and banking sector stability (*2 points*).

(c) The objective of monetary policy includes price stability, financial stability and other conflicting concerns like stimulating economic growth and employment output stability (*1 point*).

(d) The objective of monetary policy is directed to stimulate economic growth and employment with little or no concern for price stability (*0 point*).

A2.The degree of Goal or Target Independence

(a) The CB alone sets the numerical goals or targets for its objectives, for instance, exchange rates, monetary aggregates, interest rates or inflation (*3 points*).

(b) The CB and the Government jointly set the goals or targets for its objectives, for instance, through a policy targets agreement (*1.5 points*).

(c) The Government alone sets the targets for the objectives (*0 point*).

A3.The degree of Instrument Independence

(a) The CB alone sets the instruments of monetary policy to achieve its objectives (*3 points*).

(b) The CB and the Government jointly set the instruments of monetary policy (*1 point*).

(c) The Government alone decides on setting instruments (*0 point*).

A4. General policy conflicts

(a) The CB absolutely prevails over the Government in case of policy conflicts (*1 point*).

(b) The Government prevails over the CB, subject to due process and possible protest from the latter (*½ point*).

(c) The Government absolutely prevails over the CB (*0 point*).

A5. Exchange Rate Policy Co-ordination

(a) CB formulates and implements exchange rate and foreign exchange policy consistent with objectives of monetary policy, and bank's view prevails over the Government in case of policy inconsistency (*1 point*).

(b) CB formulates, and implements exchange rate and foreign exchange policy on basis of instructions given by the Government, or Government's view prevail over (*0 point*).

A6. Financial Supervision

(a) The banking supervisory function is separated from the CB and entrusted to an autonomous Government agency so that it will not impinge on monetary policy. (*1 point)*

(b) The banking supervision is jointly undertaken by the CB and a separate Government agency (*½ point*).

(c) The function of monetary policy and banking supervision is combined in a single institution, the CB (*0 point*).

Maximum Score for MPI = 12

B. Political Independence or Personnel Independence (PI)

B1. Appointment of the Governor

(a) The Governor is appointed by the CB Board or two different bodies, which really balance one another, respectively nominate and appoint the Governor, for instance, the board or ministry of finance nominates and the legislature appoints (*2 point*).

(b) The Government both nominates and appoints the Governor, for instance, ministry of finance nominates and the cabinet appoints the Governor (*0 point*).

B2. Terms of the Governor

(a) The term is longer than 5 years (*2 points*).

(b) The term is 5 years (*1 point*).

(c) The term is 4 years (*½ point*).

(d) The term is less than 4 years (*0 point*).

B3. Dismissal of the Governor.

(a) The dismissal of the Governor is possible only in the case of breach of qualification, misconduct, or poor performance; the procedures are very transparent, and with the approval of the legislature (*1 point*).

(b) The dismissal of the Governor is possible only in the case of breach of qualification, misconduct, or poor performance; but the procedures are not transparent, and not with the approval of the legislature (*½ point*).

(c) Unconditional dismissal of the Governor by the Government (*0 point*).

B4. Appointment of Board Members

(a) Government appoints not more than half the members of the board; or two different bodies, which really balance one another, respectively nominate and appoint the board members, for instance, the ministry of finance nominates and the legislature appoints (*3 points*).

(b) Government appoints more than half or all the members of the board (*0 point*).

B5. Term of the Board Members

(a) The term is longer than five years and staggered (*2 points*).

(b) The term is 5 years and staggered (*1point*).

(c) The term is 4 years and staggered (*½ point*).

(d) The term is less than 4 years and staggered (*0 point*).

B6. The Presence of Government Nominees in the Bank Board

(a) There is no mandatory participation of Government representative in the bank board (*2 points*).

(b) There is mandatory participation of Government representative in the bank board (*0 point*).

Maximum score for PI = 12

C. Fiscal Independence or Financial Independence (FI)

Limitations on CB lending to the Government

C1. Limitations on advances (non-securitized lending)

(a) CB advances to the Government prohibited (*3 points*).

(b) CB advances permitted, but with strict limits in terms of absolute cash amounts (*2 points*).

(c) CB advances permitted with loose and accommodative limits (*1 point*).

(d) No legal limits on CB advances to the Government (*0 point*).

C2. Limitations on securitized lending

(a) CB advances to the Government prohibited (*1½ points*).

(b) CB advances permitted, but with strict limits in terms of absolute cash amounts (*1 point*).

(c) CB advances permitted with loose and accommodative limits (*½ point*).

(d) No legal limits on CB advances to the Government (*0 point*).

C3. Specification of the limits of CB lending

(a) CB lending defined in absolute currency amounts (*1½ points*).

*(b) C*B lending defined in shares of Government revenue (*1 point*).

(c) CB lending defined in shares of Government expenditure (*0 point*).

C4. Maturity of loans

(a) The maturity of CB loans cannot exceed 6 months (2 *points*).

(b) The maturity of CB loans above 6 months but cannot exceed 1 year (*1point*).

(c) No legal limit on the maturity of CB loans (*0 point*).

C.5 Restrictions on Interest rates

(a) CB lends to the Government at market interest rate (*2 points*).

(b) CB lends to the Government at below market interest rates, but positive rates (½ *point*).

(c) CB lends to the Government at zero interest rates (*0 point*).

C.6 CB's participation in the primary market for Government securities

(a) The CB is prohibited from buying Government securities from the primary market or if not prohibited, CB's activity in the primary market is discretionary or voluntary (*2 points*).

(b) The CB is an active and involuntary buyer in the primary market for Government securities (*0 point*).

Maximum score for FI = 12; and Maximum score of CBI = MPI+PI+FI = 36

3. Measuring CBI in 25 Countries Using the New Index

The method of measuring CBI in different countries using the new index. is as follows. Data for the CalanderYear 2001 is chosen for measuring CBI to capture the differences in CBI across some European Union and Emerging market economies, since they were in various stages of CB reforms during this time. The MPI is measured by aggregating the values assigned to A1, A2, A3, A4, A5, and A6. PI is measured by aggregating the values assigned to B1, B2, B3, B4, B5, and B6. Similarly, FI is measured by aggregating the values assigned to C1, C2, C3, C4, C5 and C6.

Table 1 shows values of CBI in twenty five countries, which is calculated by aggregating the numerical values assigned to eighteen institutional attributes of each CB.

From table 1 (also table 2) it is clear that the Germany (33.5 points) has got the most independent CB in the world followed by United States (32 points); Chile (31 points); and Peru, Switzerland (29 points). On the other hand India (17.5 points) has got the least independent CB next to the Indonesia (20 points); Mexico (21.5 points); and the United Kingdom, South Korea (22.5 points).

Table 1
Measuring CBI and its Various Aspects in Different Countries

Aspects/	A Monetary Policy Independence							B Personnel Independence							C Fiscal Independence								
Country	A1	A2	A3	A4	A5	A6	MPI	B1	B2	B3	B4	B5	B6	PI	C1	C2	C3	C4	C5	C6	FI	CBI	INF
UK	3	0	3	0.5	1	1	8.5	0	1	1	0	0	0	2	3	1.5	1.5	2	2	2	12	22.5	1.8
New Zealand	3	1.5	3	0.5	1	0	9	0	1	1	0	1	2	5	3	1.5	1.5	2	2	2	12	26	2.7
Canada	3	1.5	3	0.5	1	1	10	2	2	1	0	0	0	5	3	1	1	1	2	0	8	23	2.6
Sweden	3	3	3	0	1	1	11	2	1	0.5	0	1	2	6.5	3	1	1.5	1	2	0	8.5	26	2.4
South Korea	3	1.5	3	1	1	1	10.5	0	0.5	1	3	0	0	4.5	2	0.5	1	2	2	0	7.5	22.5	4
US	2	3	3	1	1	0.5	10.5	2	0.5	1	3	2	2	10.5	3	0.5	1.5	2	2	2	11	32	2.8
Australia	1	1.5	3	1	1	0	7.5	0	2	1	0	1	0	4	3	1.5	1.5	2	2	2	12	23.5	4.4
Italy	2	1.5	3	0	1	0	7.5	2	2	1	0	0.5	2	7.5	3	0	1.5	2	2	2	10.5	25.5	2.7
Spain	3	1.5	3	1	1	1	10.5	0	2	1	0	2	0	5	3	1.5	1.5	2	2	2	12	27.5	3.6
Finland	3	1.5	3	0.5	1	0.5	9.5	0	2	0.5	0	1	2	5.5	3	1	1.5	2	2	2	11.5	26.5	2.5
Switzerland	1	3	3	1	1	1	10	0	2	0	3	0.5	2	7.5	3	1	1.5	2	2	2	11.5	29	0.96
France	3	1.5	3	0	1	1	9.5	0	2	1	3	2	0	8	3	0.5	1.5	2	2	2	11	28.5	1.6
Germany	3	3	3	1	1	1	12	0	2	1	3	2	2	10	3	1	1.5	2	2	2	11.5	33.5	2.3
Brazil	3	1.5	3	1	0	0	8.5	2	0	0	3	0	2	7	3	1	1.5	2	2	2	11.5	27	6.8
Thailand	3	3	3	1	1	0	11	0	0	0	3	0	0	3	3	1	1.5	2	2	2	11.5	25.5	1.7
Czech Rep	3	3	3	0	1	0	10	0	2	0	0	2	0	4	3	1	1.5	1	2	2	10.5	24.5	4.7
Chile	3	3	3	1	1	1	12	2	1	1	3	2	2	11	3	1	1	1	2	0	8	31	3.6
Poland	3	3	3	1	1	0	11	0	2	0	0	1	2	5	3	1	1	1	2	0	8	24	5.5
Indonesia	1	3	1	0	0	0	5	2	1	1	3	1	0	8	3	0	0	2	2	0	7	20	11.5
Israel	3	1.5	3	1	1	0	9.5	0	1	1	0	1	2	5	3	1	1.5	2	2	2	11.5	26	1.2
South Africa	2	3	3	0.5	1	0	9.5	0	1	0.5	3	0	2	6.5	2	1	1	1	2	0	7	23	5.6
Malaysia	2	1.5	3	1	1	0	8.5	0	1	1	0	0	2	4	3	1	1	2	2	2	11	23.5	1.4
Mexico	3	3	3	0	0.5	1	10.5	0	2	1	0	2	0	5	2	0	0	2	2	0	6	21.5	6.3
India	1	3	1	0.5	1	0	6.5	0	1	1	0	0.5	0	2.5	2	1	1.5	2	2	0	8.5	17.5	3.6
Peru	3	1.5	3	0.5	1	1	10	2	1	1	3	1	2	10	3	1	1	2	2	0	9	29	2

Note: The new index of CBI is constructed as a sum of the numerical values assigned to eighteen institutional attributes (both in law and practice) of CBs: six attributes each for Monetary Policy independence (MPI); Personnel or Political independence (PI); and Fiscal or Financial independence (FI).The score assigned to each criterion is aggregated to obtain the value of CBI that takes a scale of 0-36. Higher the value assigned to each criterion, higher will be the CBI. INF is annual rate of inflation.

5. Central Bank Independence and Inflation Performance

Based on the new index for the CBI, the summary of the values calculated for 25 countries are shown in the table 2. Higher value of the index means higher independence and vice versa. The values are also calculated for MPI, PI and FI. Data sources for measuring different aspects of CBI are mainly from Annual Reports, Inflation Reports, Statutes and web pages of different Central Banks; and speeches of Central Bank Governors. Since the data for the index of CBI refer to the year 2001 (normal year devoid of any supply shocks), annual inflation data also correspond to the same year, measured as the change in consumer prices, which is obtained from the IMF's International Financial Statistics.

Table 2
CBI and Inflation Rates in Developed and Developing Countries

Country/Aspects	MPI	PI	FI	CBI	Ranking of CBI	Annual Rate of Inflation *
United Kingdom	8.5	2	12	22.5	15	1.8
New Zealand	9	5	12	26	9	2.7
Canada	10	5	8	23	14	2.6
Sweden	11	6.5	8.5	26	9	2.4
South Korea	10.5	4.5	7.5	22.5	15	4
United States	10	11	11	32	2	2.8
Australia	7.5	4	12	23.5	13	4.4
Italy	7.5	7.5	10.5	25.5	10	2.7
Spain	10.5	5	12	27.5	6	3.6
Finland	9.5	5.5	11.5	26.5	8	2.5
Switzerland	10	7.5	11.5	29	4	0.96
France	9.5	8	11	28.5	5	1.6
Germany	12	10	11.5	33.5	1	2.3
Brazil	8.5	7	11.5	27	7	6.8
Thailand	11	3	11.5	25.5	10	1.7
Czech Rep	10	4	10.5	24.5	11	4.7
Chile	12	11	8	31	3	3.6
Poland	11	5	8	24	12	5.5
Indonesia	5	8	7	20	17	11.5
Israel	9.5	5	11.5	26	9	1.2
South Africa	9.5	6.5	7	23	14	5.6
Malaysia	8.5	4	11	23.5	13	1.4
Mexico	10.5	5	6	21.5	16	6.3
India	6.5	2.5	8.5	17.5	18	3.6
Peru	10	10	9	29	4	2

Note: MPI is the index of Monetary Policy Independence; PI is Personal or Political Independence; FI is the Fiscal or Financial independence; and CBI = MPI + PI + FI. Higher the value, greater will be the CBI.

* Inflation rate is taken as the percentage change in CPI for the year 2001 from International Financial Statistics published by IMF.

Simple cross-country regression analysis[16] of inflation on CBI values shows the existence of a significant[17] negative relationship between CBI and inflation, which is consistent with the theory. The components of CBI- FI and MPI also exhibit significant[18] negative association with inflation, albeit that relationship between PI and inflation is surprisingly positive and not significant.

V

Summary and concluding remarks.

In this Paper I have made a wide survey of the theoretical literature on CBI, highlighting the features of the negative association between CBI and Inflation. I have presented the methodology used for the construction of the new index of CBI and used this index to measure the actual CBI in 25 countries, while examining its relationship with inflation. The study shows that Germany[19] has got the most independent CB (now the European Central Bank) in the world followed by the United States, while India has got the least independent CB next to that of Indonesia. Simple cross-country regression analysis of inflation on CBI values shows the existence of a significant negative relationship between CBI and inflation, which is consistent with the theory.

The new CBI index offers a strong model for optimal implementation and sequencing of CB reforms in emerging market economies, including India. It is desirable and feasible for India to first adopt a Bank of England type of Monetary Policy Independence and later go in for a Federal Reserve Bank model of Political Independence. In this context CBI has to be viewed as an incentive mechanism to insulate the CB from political motives so as to provide it enough freedom to maximize

the objectives of monetary policy. One the other hand, introduction of sophisticated accountability mechanisms for the CB would help to solve the policy co-ordination problems and democratic deficit of an independent CB, while ensuring the political popularity and irreversibility of institutional reforms of CBs.

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Notes

1 Also see Reddy (2001a, b).

2 The Advisory Group on Transparency in Monetary and Financial Policies indicated an overall concept and context of transparency, evaluated India's compliance with international codes and made several recommendations. The Advisory Group (AG) explained that transparency refers to an environment in which the objective of policy, its legal, institutional and economic framework, policy decisions and their rationale, data and information relating to monetary and financial policies and the specifics of accountability of different agencies are provided to the public in an unequivocal and understandable manner and accessible on a timely basis. First, the AG recommended institutionalization of the process of communicating the formulation of monetary policy, *albeit* on a *post facto* basis, to ensure transparency so that accountability of the RBI can be properly assessed. Second, the AG made several other recommendations relating to desirability of single objective for monetary policy with inflation as the objective, setting up of a Monetary Policy Committee, disclosure requirements in respect of banks, financial institutions, supervisory authorities, regulators, etc., but these have indirect linkage with fiscal transparency. Third, the AG recommended that the determination of interest rates should be exclusively a monetary policy function and that there should be well-calibrated legislative measures to separate debt management and monetary policy functions. Over a phased period, as debt management is gradually distanced from monetary policy, the Government and RBI should progressively work towards greater clarity in publicly setting out the objectives of monetary policy.

3 See Barro and Gordon (1983b); Backus and Driffill (1985); and Cottarelli and Giannini (1998)

4. The theory of political business cycle states that business cycles are created by electoral and partisan motives of elected government. Political incumbents follow expansionary policies towards the end of their term to increase the chances of re-election, while follow contractionary policies in the beginning of their new term. This results in election cycles in the form of low unemployment and low inflation during the pre-election period followed by high inflation and high unemployment in the post election period.

5 Political cycles of similar kind are also created when political parties with different ideologies or preferences alternatively form the government. This happens when right wing parties prefer low inflation/high unemployment, while left wing parties prefer high inflation/low unemployment

6 CBs may have lower time preference rate and higher weight to inflation relative to employment than the political authorities. If monetary policy is left to the discretion of a conservative central banker, with policy independence, the result will be a lower average, time-consistent inflation rate

7 The principal agent approach has been explicitly implemented in New Zealand, where the CB has the mandate and responsibility to pursue price stability as primary and overriding objective of monetary policy, through the framework of inflation targeting. The governor of the CB agrees on a target inflation path with the government, subject to condition that the tenure in the position may depend on whether or not the target is achieved. In this contract approach, CB has instrument independence but no goal independence.

8 New Zealand was the first country to formally adopt inflation targeting in 1990, followed by Canada in1991, the UK in1992, Sweden and Finland in 1993, and Australia and Spain in 1994. Further, the increasing disillusionment with the fixed exchange rates in many Latin American countries after the destructive financial crisis in 1990s has instigated many emerging economies like Chile, Brazil, the Czech Republic, Poland and South Africa to go in for Inflation targeting. Brazil adopted inflation targeting in the wake of its currency crisis in early 1999. Later on Korea, Thailand, and Indonesia went for inflation targeting gain anti-inflation credibility.

9 See Barro (1995) for empirical analysis of the link between inflation and growth.

10 See Briault (1995) and Svensson (1999) for a survey of the theoretical justifications for low inflation

11 See Debelle and Fischer (1994)

12 See Alesina (1989

13 See Canzoneri and Diba (1996), Sargent and Wallace (1981), and Woodford (1996) for a theoretical treatment of the size and sustainability of the government deficit; and also Fry (1998) for an empirical analysis of CBI and government borrowing.

14 There is no non-arbitrary way of aggregating the various criteria or attributes of CBI to a composite index. The value of the index is subject to interpretation bias, weighting bias and criteria bias, since, here some kind of subjectivity is unavoidable

15 Maximum Score for CBI = 36.
Monetary Policy independence (12) + Personnel independence (12) +Fiscal independence (12) = CBI = 36

16 Due to lack of reliable data for different time periods and consistency problems, I could not measure the CBI index over time and could not perform panel data analysis. The degree of robustness of conclusions of analysis is conditional on: extending the number of countries under study; using alternative measures of the characteristics of monetary policy; or more importantly, by systematically controlling for other informal rules and procedures as well as the broader constitutional and intellectual environment in which monetary policy is made. The inclusion of other control variables like trade openness, debt-GDP ratio, financial openness, the degree of exchange rate flexibility, GDP per-capita, index of political instability and the tax-GDP in the regression may influence the results. The value of the index is subject to interpretation bias, weighting bias and criteria bias, since, here some kind of subjectivity and arbitrariness is unavoidable

17 At 5 percent level

18 At 1 percent level.

19 European Central Bank (ECB) is modeled on the lines of the German CB, which is now a part of the European System of Central Banks

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