Determinants of Central Bank Independence and Governance: Problems and Policy Implications

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Abstract

Central bank independence and governance (CBIG) is a term subject to conflicting definitions and so its related studies are difficult to compare. This paper therefore focuses on developing of a more useable definition, and an index model identifying the determinants of independence and governance and their possible policy implications. It also examines various independence measurement tools such as ranking and index. The index model resulting centres on key central bank independence and corporate governance issues, such as, legal aspects, political aspects, price stability objective aspects, exchange rate policy aspects, monetary policy and deficit financing aspects and finally, transparency and accountability aspects.

Key Words: Central bank independence, governance, legal independence, election and parliament scrutiny, price stability and inflation, exchange rate policy, economic independence and financial stability, transparency and accountability.

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Introduction

The issue of central bank independence and governance (CBIG) has generated considerable debate over recent years. As central banks are created by government legislation, there is always some kind of a relationship between the central bank and the government. Indeed, it may not be possible to completely separate them; the debate today is about the appropriate degree of separation.

The main researchers of CBIG have developed different indices and measurement tools of independence and governance. They focus primarily on legal and political aspects. Some also addressed the monetary policy, economic independence or accountability and transparency aspects. Just as the CBIG is subject to debate, the definition of legal, political, economic and other aspects of independence has generated a range of views. What one author calls as legal independence, others have identified as political or economic or policy independence. The same problem exists in determining which variables should be used to measure CBIG.

The purpose of this paper is to identify the key determinants of CBIG, to develop an index model and a workable definition of CBIG and to show the policy implication of each aspect of the index separately. The specific contribution of this paper is CBIG definition and six factor index model comprised of legal, political, price stability objective, exchange rate policy, monetary policy and deficit financing and finally, accountability and transparency.

The remainder of the paper is organised as follows, the next section, explains independence and governance for a central Bank. The third section categorises the existing literature into six different aspects of CBIG. The fourth section proposes an index model of determinants of CBIG to address the problems in the existing literature. The fifth section the index construction and finally, the conclusion of the study.

Independence and Governance for a Central Bank

Independence and governance are two key terms relates to central bank. Independence refers to the ability of the central bank to use the instruments of monetary control without instruction, guidance or interference from the government (Henning, 1994). On the other hand, according to Amtenbrink (2004), the three pillars of central bank governance are: i). central bank independence, ii). central bank accountability, and iii). central bank transparency. So, it means good governance in a central bank is a function of its independence and some other factors and iindependence and governance should go hand in hand.

Other authors have their view in explaining independence and governance as well. The word "governance" is synonymous with the exercise of authority, direction, and control (Zingales, 1997). A central bank can easily be considered with a corporate body, and all the corporate governance issues for a corporation are mostly applicable for a central bank. Similarly, the issues of authority (authority to execute its policies); direction (direct the economy towards its objectives) and finally, control (control its tools and techniques for achieving its goal) are also applicable for a central bank.

Previously, the central bank literature was mostly concentrated on the independence issue, but the current literature is very much directed towards governance of central bank, which includes, analytical framework of degree of autonomy, directors and their functions and the board of the bank and its management (Lybek and Morris, 2004). Moreover, it also means the credibility of the monetary policy and appropriate reform of central bank legislation (Lybek, 2004). The central bank independence (CBI) indices developed by different researchers are discussed in the determinants of CBIG section. A close look at the variables included in those indices would reveal that they covered most of the aspects of today's governance issues. Similarly, the index model developed for this study covers both independence and governance issues, such as, the office term, authority to appoint and dismiss the governor are in legal index, structure of the board, independence of the board members are in political index, whether the price stability objective is sacrificed to the political agenda of the government is covered in price stability objective index, share of controlling authority between the central bank and market is in the foreign exchange index, monetary policy independence and government borrowing in monetary policy and deficit financing index, and finally, reporting, meeting information, audit and accountability of the governor in the accountability and transparency index.

Our analysis of the existing literature identified a range of definitional and variable overlapping problems. In Table: 1 these key definitional and overlap problems are shown across different indices. The identification of correct definition and variables are also very important from policy implication point of view. Use of incorrect variable for certain policy independence and governance would indicate wrong policy implications.

Table 1. Overlap of Variables

Policy/Economic Independence	*Political Independence*	*Legal Independence*	*Accountability & Transparency*	*Central bank governance*
Bade and Parkin (1988) -Central bank laws (L) -Inflation (I) -Policy variability (P) -Appointment of governor (G)	Grilli, Masciandaro, and Tabellin (1991) - Legal capacity to choose the final goal of monetary policy (L) -Inflation (I) -Economic activity (P) -Appointment of central banker (G)	Cukierman, Webb and Neyapti (1992) - Inflation (I) -The policy formulation and objective of the central bank (P) -Governor turnover (G)	de Haan, Amtenbrink and Eijffinger(1999) -Does the central bank law stipulate the objectives of monetary policy? (L) -Policy formulation (P) -Dismissal and appointment of the governor (G)	Amtenbrink (2004) Three pillars of central bank governance -Central bank independence -Central bank accountability -Central bank transparency
Alesina and Sachs (1988) Alesina (1989) -Appointment and dismissal from office of the directors (G) -Inflation (I)	Cukierman and Webb (1995) -Timing and frequency of governor turnover (G)	Posen (1993) -Central bank regulation (L) -Inflation (I)		Lybek (2004) -Credibility of monetary policy (P) -Reform of central bank legislation (L)
Eijffinger and Schaling (1992, 1993a, 1993b) -A government representative appointed on the bank board (G)		de Haan, and Van 'T Hag (1994) -Central bank regulation (L) -Inflation (I)		Lybek and Morris (2004) Elements of good governance -Analytical framework of degree of autonomy -Directors and their functions -Important elements of boards and management

Source: Ahsan, Skully and Wickramanayake (2004) with slight modification

The overlapping variables across the columns are shown by alphabetic symbols such as (G)= Governor, (I)= Inflation, (L) = Law, (P)= Policy and Economy by Ahsan, Skully and Wickramanayake (2004). The difference is just not definitional but also relates to the determinants of each aspect of independence and their policy implication.

Determinants of Central Bank Independence and Governance

To identify the correct determinants of CBIG, the existing literatures have been classified into following sub-sections: legal aspects, political aspects, price stability objective aspects, exchange rate policy aspects, monetary policy and deficit financing aspects and finally, transparency and accountability aspects.

Legal Aspects

The independence and governance of legal aspect refers to the freedom or flexibility permitted to a central bank by legislation. This is an important aspect of the overall CBIG. "Legal independence is one, but certainly not the sole, determinants of central bank independence. It also suggests the degree of independence that legislators meant to confer to the central bank," however, as Cukierman (1993, pp. 274) defined, similarly other authors have their own definitions and method of independence measure. Table 2 provides summary of a selection of the key papers.

Table 2.Legal Aspects of CBIG

Author(s)	*Measure of CBIG*	*Sample and Period*	*Test*	*Result*
Bade and Parkin (1988)	The relationship between central bank legislation and the financial and budgetary relationship.	11 countries, all European countries except New Zealand 1963-1992	Ranking	No association discerned between policy independence and the two features of monetary policy, inflation level and variability.
Grilli, Masciandaro and Tabellini (1991)	The legislative capacity to choose the final goals of policy.	18 OECD countries 1950 to 1989	Regression	The central bank's constitutional position is clearly strengthened if its role in preserving monetary stability is explicitly stated in the constitutions.
Cukierman, Webb and Neyapti (1992)	The legal characteristics of the CB are grouped into four clusters of issues: turnover rate of governors, the policy formulation, the objective of the CB and limitations on the ability of the CB to lend to the public sector	72 countries both developing and industrial 1950 to 1989	Regression	Legal independence is significant determinant of price stability among industrial countries but not in developing countries. The turnover rate is not significant in explaining variations of inflation within the industrial countries.
de Haan and Van 'T Hag (1994)	Countries whose CBs do not regulate financial institutions are keener against inflation, and have therefore, more independent central banks.	OECD countries 1980-1989	Regression	Limited support found for CBI

In a cross country relationship between the monetary policy and the central bank legislation, Bade and Parkin (1988) found no association between independence (legal) and the two features of monetary policy, inflation level and variability. Where as Grilli, Masciandaro, Tabellini (1991), Cukierman, Webb, and Neyapti (1992) found legal independence as a significant determinant factor. In another study, de Haan and Van 'T Hag (1994) used a much shorter time period of ten years compared to forty years used by Grilli, Masciandaro, Tabellini (1991) and found limited support of CBIG.

So, the most of the studies found evidence of CBIG related to the legislative protection of its operational and policy formulation activities. Li et al., (2005) also considers law enforcement as one of the factor of corporate governance. In some of the studies, legal aspects of independence have been identified as political aspects. As politicians are dealing with the legal aspects of a country and central bank, it is sometimes difficult to separate them.

Political Aspects

The political independence and governance reflects the degree to which the central bank is allowed to pursue its main objective, presumably price stability, without interference from the political authorities. The influences of partisan electoral cycles on macroeconomic policy were first described and analysed expressively by Hibbs (1977). The central bank's political independence is determined by a number of factors, including the procedures for appointing the central bank's chairman and independence of board members, the term of office of central bank officials (Grilli, Masciandaro and Tabellini 1991). Investigating another aspect of political independence, a cross-country study reveals that the output costs of disinflations are higher, not lower, in countries with central banks that are politically independent (Fischer 1996, Jordan 1997 and Posen 1998). Table 3 summarises the finding of few studies in this regard.

Table 3.Political Aspects of CBIG

Author(s)	*Measure of Independence*	*Sample and Period*	*Test*	*Result*
Grilli, Masciandaro and Tabellini (1991)	The political independence is determined by (i.) the procedure for appointing the members of the CB bodies; (ii) the relationship between these bodies and the government; and (iii) the formal responsibilities of the CB.	18 OECD countries 1950 to 1989	Regression	If government appoint the governor, mandatory to have government representative in the board, no legal provision then political independence index will be very low.
de Haan and Van 'T Hag (1994)	The higher the level of political stability, the more independence that is granted to the central bank.	OECD countries 1980-1989	Regression	The CBI is negatively related with political instability.
Cukierman (1993) Cukierman and Webb (1995)	Measuring the degree of political influence on the central bank autonomy.	67 industrial and developing countries 1950-1989	Regression	Positive influence of the political instability on the central bank autonomy.
Grier and Grier (2004)	The study measures the effect of elections on the real exchange rate process and the effect of CBI.	9 Latin American countries 1980-2000	Regression	The politicians seek to delay potentially politically costly real exchange rate depreciation until an election.

Generally, political parties like to remain in power. So, they will use or misuse central bank policy to fulfil their own political agendas. Similarly, political instability also can affect CBIG.

Evidence of such a negative relationship was found in OECD countries during 1980 to 1989 (de Haan and Van 'T Hag, 1994). Cukierman (1993) and Cukierman and Webb (1995) found similar evidence. Both studies covered 67 industrial and developing countries and longer time period than de Haan and Van 'T Hag. This political influence can affect country's monetary policy, interest rate and even the exchange rate.

Price stability objective aspects

The delegation of monetary policy power to central banks is believed to lower inflation and ensure independence and governance. Bade and Parkin (1985) conducted one of the first empirical studies of this link. A number of studies have since found empirical support for this negative relationship between CBIG and inflation in industrial countries (Alesina and Summers, 1993). The empirical evidence from the developing countries, however, has been less clear-cut. Table 4 details a few key papers on this relationship.

Table 4.Price Stability Objective Aspects of CBIG

Author(s)	*Measure of Independence*	*Sample and Period*	*Test*	*Result*
Grilli, Masciandaro and Tabellini (1991)	Estimating the effect on inflation of the indicators of economic and political independence.	18 OECD countries 1950 to 1989	Regression	CBI always has a negative effect on inflation
Cukierman, Webb and Neyapti (1992)	Examine relationship between inflation; turn over rate of governor and level of independence.	72 countries developing and industrial 1950 to 1989	Regression	Less independence contributes to higher inflation. The turnover of the governors contributes significantly to explaining inflation.
de Haan and Van 'T Hag (1994)	Examine the relationship between CBI and inflation, employment, monetary policy, and inflation in a non-regulatory environment.	OECD countries 1980-1989	Regression	CBI is positively related to historical inflation experience.
Cukierman and Webb (1995)	Measure the relationship between inflation and CBI	67 industrial and developing countries 1950-1989	Regression	Developing countries have, on average, higher and more variable inflation than industrial countries do
Brumm and Krashevski (2003)	Examine the relationship between a countries sacrifice ratio and CBI.	Analyse problem of the previous studies	Regression	Strong negative relationship between the sacrifice ratio and CBI.
Ismihan and Ozkan (2004)	Relationship between CBI, public investment and inflation.	Theoretical two period model	Model of policy making	Argues that the effects on growth make CBI less likely to achieve lower inflation in the long term.

The study developing and industrial countries by Cukierman, Webb and Neyapti (1992) and Cukierman and Webb (1995) reveals that legal independence is inversely related to the inflation in industrial countries but not in developing ones. Similarly, other studies by Grilli, Masciandaro and Tabellini (1991), de Haan and Van 'T Hag (1994), and Brumm and Krashevski (2003) found negative relationship between the CBIG and the level of inflation in the country. The negative effect of the CBIG does not only affect the inflation in the short run but also has more severe long run effects on public investment and future growth of the country, Ismihan and Ozkan (2004). As a result it is very unlikely a country can achieve lower inflation rate in the long run as well.

Exchange Rate Policy Aspects

Traditionally finance ministries or treasuries have held ultimate responsibility for exchange rate policy of a country. At the very least, this responsibility is shared between governments and central banks. The degree of independence afforded to the central bank is critical in the ability of the government to pursue exchange rate targets (Baines, 2001). Table 5 presents different areas of foreign exchange policy related to CBIG.

Table 5.Exchange Rate Policy Aspects of CBIG

Author(s)	*Measure of Independence*	*Sample & Period*	*Test*	*Result*
Baines (2001)	CBI is examined as a proxy for foreign exchange market intervention.	12 industrialised countries 1973 to 1998	Regression	Negative relationship between foreign exchange intervention and CBI
Kuttner and Posen (2001)	Measures the impact of central bank autonomy on inflation and exchange rate.	41 countries OECD, Latin America, East Asia 1998 to 2000	Regression	Central bank autonomy is associated with a more stable exchange rate and lower inflation
de Souza (2002)	Estimates if the different monetary and exchange rate framework yield different outcomes in terms of level and variance of a set of nominal and real variables.	Accession countries of Central and Eastern Europe and Baltic 1989 to 2001	Regression	A flexible exchange rate regime, coupled with an independent monetary authority and inflation targeting, would be pareto-improving when compared to harder regime.
Grier and Grier (2004)	The study measures the effect of elections on the real exchange rate process and the effect of CBI on the effect.	9 Latin American countries 1980-2000	Regression	CBR has on average wiped out electorally motivated RER, depreciations, reduced the average rate of RER depreciation and lowered RER uncertainty.

The level of CBIG is also related to the exchange rate policy of a country. Baines (2001), using the same sample as Eijffinger-Schaling (1992) found a negative relationship between foreign exchange market intervention and CBIG. In a study of broad data set of nearly 200 monetary frameworks Kuttner and Posen (2001) found that central bank autonomy is associated with more stable exchange and lower inflation rate. Using the same methodology, de Souza (2002) concluded that a flexible exchange rate regime, coupled with an independent monetary authority and inflation targeting, would be pareto-improving when compared to harder regime.

Monetary Policy and Deficit Financing Aspects

Monetary policy is identified with the nature of the instruments under control of the central bank such as the interest rate and/or the ability to conduct open market operations. Consequently, the greater the government influence on the monetary financing of the budget deficit, the smaller degree of independence of the central bank (Grilli, Masciandaro and Tabellini 1991, Bade and Parkin 1988, Alesina and Sachs 1988, Alesina 1989). If monetary policy is mishandled, inflation may become rapid and volatile. But, timely, modest interest responses to inflation surprises can contribute powerfully to long-run financial stability (Sinclair, 2000). Table 6 presents the summary of the key papers with an objective to find out a uniform or common set of determinant factors of monetary policy and deficit financing.

Bade and Parkin (1988) investigate the cross-country relationship between the monetary policy and central bank found no association between them. Later their test was extended by Alesina and Sachs (1988) and Alesina (1989) by adding an extra criterion and found the same result like Bade and Parkin. The policy independence of central bank is also measured by Eijffinger and Schaling (1992, 1993b) by identifying the capacity of central banks to choose the final goals of monetary policy. They have concluded that incomplete policy authority and twin authority in central bank make the bank less independent.

The budget deficit may lead to inflation, particularly when the financial market is not developed and the central bank is not independent (Neyapti 2003). Similarly, interference in capital market by the government reduces the allocation efficiency of the capital market and may reduce growth. Similarly, countries with lower independence also have lower level of private investment. So, the level of financial development and CBIG determine a country's the level of growth in country (Cukierman, Kalaitzidakis, Summers, and Webb 1993).

Table 6. Monetary Policy Aspects and Deficit Financing of CBIG

Author(s)	*Measure of Independence*	*Sample & Period*	*Test*	*Result*
Bade and Parkin (1988)	The two types of independence are policy independence and financial independence	11 countries, all European countries except New Zealand 1963-1992	Ranking	No association can be discerned between policy independence and the two features of monetary policy, inflation level and variability.
Alesina and Sachs (1988) Alesina (1989)	Alesina includes one more variable to BP policy index, whether the CB is obligated to buy short-term Treasury paper?	11 countries, 10 European and NZ 1963-1992	Ranking	No association can be discerned between average inflation and the degree of CBI for the countries.
Grilli, Masciandaro and Tabellini (1991)	Economic independence means (i.) level of borrowing from CB and (ii) the nature of the monetary instruments under the control of the CB.	18 OECD countries 1950 to 1989	Regression and Ranking	The economic independence of CB is greater if direct credit to the government is: non-automatic and very restrictive.
Eijffinger and Schaling (1992, 1993b)	Policy independence is determined by 1). power to formulate monetary policy 2). government representatives in the bank board 3) are more than half the board members appointed independently of the government?	11 countries, all European countries except New Zealand 1963-1992	Ranking	Incomplete policy authority, and twin authority in central bank makes the bank less independent.
Cukierman, Kalaitzidakis, Summers and Webb (1993)	Examining the relationship between growth and CBI.	70 countries LDC and industrial 1960 to 1989	Regression	The main finding of the paper is that CBI has a positive effect on growth in LDCs and no effect within industrial countries.
Sinclair (2000)	The focus of this study is the powers and formal functions of the central banks to determine the nature of the financial stability policy	Total 37 (13 industrial, 16 developing & 8 transition) CBs. Survey in 2000	Survey	Where financial markets are usually less developed CB's regulatory and supervisory functions is negatively correlated with their degree of independence.
Sterne (1999)	To assess the targets of the monetary policy in a range of economies.	91 central banks Survey in 1998	Survey	Explicit monetary policy targets have become more widely used in the 1990s than Bretton Woods era.
Neyapti (2003)	The degree of both financial market development and CBI affect not only the degree of monetary accommodation of budget deficits in a given period but also the expectations about future monetary accommodations of budget deficit.	54 developed and less developed countries, time-series data of 10-20 years.	Hypothesis testing	The budget deficits lead to inflation particularly when the financial market is not developed and the central bank is not independent.

Accountability and Transparency:

Transparency of central banks has been defined as the degree of genuine understanding of the monetary policy process and policy decisions by the public (Winkler, 2000). Sometimes, transparency refers to the activities of the central bank in providing information (Geraats, 2000). For a long time, central banks have been associated with secrecy. Fraser (1994, p.6) argues, "as a central bank becomes more independent, it needs to be more accountable for its actions." In the context of a public corporation, a survey of corporate governance by Claessens and Fan (2002) reveals that low transparency results from lo level of corporate governance. Recently, various central banks embraced openness. A comprehensive survey of 94 central banks by Fry, Goodhart and Almeida (1996) reveals that 74% of the respondents consider transparency a vital or very important component of their monetary policy framework. Here, table 7 focuses on different measures and findings of transparency, accountability and CBIG covered in few key papers.

Table 7. Transparency, Accountability of CBIG

Author(s)	Measure of Independence	Sample and Period	Test	Result
de Haan, Amtenbrink and Eijffinger (1999)	Examine the relationship between CBI and accountability, indicator for democratic accountability	16 central banks Indicator constructed in 1998	Regression	Negative relationship between CBI and accountability.
Eijffinger and Hoebrichts (2002)	A theoretical model of transparency includes, the transparency and authority of final responsibility for monetary policy.	5 key central banks	Model developed	The author shows that more transparency leads, low rate of inflation, less stabilization of supply shock.
de Haan and Amtenbrink (2003)	An indicator of central bank to measure their disclosure by taking objectives, strategy, communication strategy.	ECB and 5 other countries. Indicator constructed in 2003	Construction of disclosure index	The ECB ranks high on the proposed central bank disclosure indicator. Nevertheless, evidence suggesting that financial markets do not consider the ECB to be transparent.

de Haan, Amtenbrink and Eijffinger, (1999) explain the central bank accountability with three different aspects, in a test of three aspects, the first aspect of the accountability shows a positive relationship (not significant) but the rest of the two aspects, transparency and responsibility appear to have a negative relationship (significant) with CBI. The overall conclusion is that there is a negative relationship between CBI and transparency, which contrary to the general notion of positive relationship between the CBI and the transparency.

In one of the later studies the concept of democratic accountability of central banks is outlined, and compared the legal accountability of European Central Bank (ECB) with some other central banks by A theoretical model of transparency for the central banks has been developed by taking two major issues into consideration; they are: the transparency of actual monetary policy and the question of who bears final responsibility for monetary policy. This model is built on the earlier work by Transparency reduces the uncertainty about the central bank's preferences and can be achieved by publication of relevant information.

The model of democratic accountability was developed by Eijffinger and Hoebrichts (2002), based on the earlier work done by Lohmann (1992), Schaling and Nolan (1998) and Eijffinger, Hoebrichts and Schaling (2000). They reached to a conclusion that the accountability through transparency leads to a lower expected rate of inflation.

The Model of CBIG

From the survey of the CBIG literature, six major determinants have been identified. The selections of variables for each aspect are designed in a way, so that overlapping problems can be solved and hence, an effective model of CBIG can be developed and the correct policy implications of each index can be identifies (see figure: 1).

Legal Aspects

The legal independence is measured by law and legislation passed by the government. It measures, the term of office of Governor/CEO mentioned in the law, who has the legal power to appoint and dismiss the Governor/CEO, and also whether the regulation and supervision responsibility of the central bank has been separated from it or not. If the term of the governor is longer than the term of the government then it is considered more independent. Similarly, if the regulation responsibility has been separated then it means the central bank has been allowed to devote more time in its own objectives than supervising the entire banking sector.

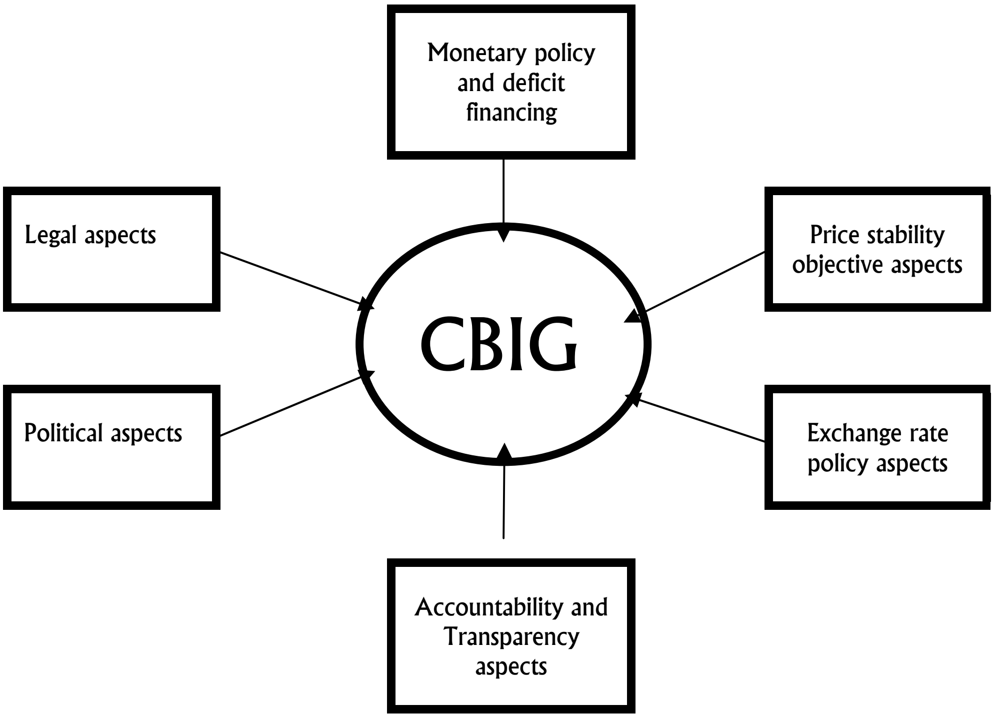
Political Aspects

The issues covered under this aspect are the political or non-political turnover of Governor/CEO, the proportion of government representatives in the management board of the bank and also whether the Governor/CEO hold other office in the government or not. If the governor is changed within the six months after a new national election, then it is considered as political turnover. If the change is due to any other reason, then it is considered as non-political turnover.

Price and Inflation Stability Aspects

The most important or the only desired objective of any central bank is the price stability. If the central bank has other objective with price stability then its ability to achieve the main objective will be hampered. Banks, which follow targeting method for maintaining inflation and interest rate, are in a better shape to maintain price stability.

Figure 1. Model of CBIG



Exchange Rate Policy Aspects

The role of central bank would vary depending upon the fixed, managed or floating system it is adopting. The other issues need to be examined are: who decides exchange rate regime, intervention on the foreign exchange, foreign exchange control and foreign exchange borrowings.

Monetary Policy and Deficit Financing Aspects

The monetary policy and deficit financing independence of a central bank can be determined by examining- authority responsible for monetary policy formulation, the final word in resolution of conflict, lending to the government, its terms and conditions. Flexible maturity and low interest rate on loan will always make a central bank financially inefficient.

Accountability and Transparency Aspects

The objectives of a transparent central bank should always be clear and easy to understand. It will set its priorities and would communicate with people. Reporting of economic and other related data increases the confidence of other participants in the economy about the activities of the central bank. A central bank can be accountable but preferably to the parliament instead of government, otherwise there is a possibility of being dictated by the government.

The six arrows from the six aspects indicate how they all together determine CBIG. This index model also paves the path for a workable definition of CBIG. The workable definition is--- CBIG means that a bank has the legal power to protect its self from external influence, has the freedom to set its monetary policy and can implement its objectives without any political interference, can select the appropriate instruments to control the price, inflation, exchange rate stability and limited accountability to the parliament of the country to keep its activities transparent.

Index construction:

Given the model of CBIG in figure 1, six sub indices are constructed with 27 variables. 1. Legal Aspects (CBIGLeg), 2. Political Aspects (CBIGPol), 3. Price Stability Objective Aspects (CBIGPStab), 4. Exchange Rate Policy Aspects (CBIGForx), 5. Monetary Policy and Deficit Financing Aspects (CBIGMonPol), 6. Accountability and Transparency Aspects (CBIGAccTrans). The methodology of Cukierman, Webb and Neyapti (1992) together with de Haan, and Amtenbrink (2003) and Neyapti (2003) is used to select the variables for most indices. For the index of foreign exchange policy aspect, a survey of developing country central banks by Fry, Goodhart and Almeida (1996) was followed. Other studies by different authors also helped identifying variables for the index. The detail of the index construction is presented in Appendix 1& 2.

The multiple answers under each variable are structured from most weighty to less weighty.

The most weighty (most independent) receives a hundred percent weight and then the weight gradually decreases according to the contribution to independence and governance.

Conclusion

This paper developed an index model covering all necessary aspects of CBIG. Within this model each aspect is defined carefully to avoid any overlapping problems and capable of showing the policy implication of each aspects separately. The policy implications of applying this model in practice are substantial. It will help to develop correct indices and ranking techniques to evaluate the independence and governance of central bank. This model is capable of assessing the CBIG in any economy. The model has its advantages over other previous indices. Central banks would be in a better position to manage its inflation, exchange rate, economic growth and monetary policy. These are the direct and positive implications of the index model. The other implications are that it will motivate the government to take correct and necessary actions such as, passing proper laws, making the activities of the central bank transparent by removing political or any other influences.

The study is expected to provide several contributions to the CBIG literature. Firstly, it is the first study to address the problem of inconsistent and overlapping definitions by developing a workable definition of CBIG. Secondly, it will also be the first model to combine the independence and governance issues of central bank. Thirdly, it develops an index of CBIG with six determinants (sub indices), so that the most important determinant can be identified. The overall index and six sub indices have great policy implications. The overall index shows the overall independence and governance of the central bank, whereas the six subindices indicate about the strength and weakness of specific aspects of independence and governance.

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Appendix: 1 Index construction

	Variables	Coding
1.	**LEGAL (CBIGLeg)**	
a.	Terms of office of Governor / CEO	
	6 years or more	1.00
	5 years	0.67
	4 years or less	0.33
	Not Mentioned	0.00
b.	Legal power to appoint Governor/ CEO	
	Board of the central bank	1.00
	Parliament/Legislature	0.50
	Government/ Executives	0.00
c.	Legal power to Dismiss Governor/ CEO	
	Board of the central bank	1.00
	Parliament/Legislature	0.50
	Government/ Executives	0.00
d.	Has the regulatory responsibility been separated from central bank?	
	Yes	1.00
	No	0.00
2.	**POLITICAL (CBIGPol)**	
a.	Turnover of Governor / CEO	
	Political (if, the Governor changed with in 6 months of political change)	0.00
	Non-political	1.00
b.	Members of the management board of Bank	
	Non government persons	1.00
	Not mentioned government or non-government	0.67
	Government Employees	0.33
	Government Ministers	0.00
c.	Does Governor/CEO hold other office in the government?	
	No, Governor/CEO does not	1.00
	Yes, he/ she does	0.00
3.	**PRICE STABILITY OBJECTIVES (CBIGPStab)**	
a.	Price stability	
	It is the major or only objective of the bank	1.00
	Price stability is one objective with other compatible objectives	0.67
	No objectives stated in the bank charter	0.33
	Stated objectives do not include price stability	0.00
b.	Inflation	
	Inflation targeting and forecasting by CB	1.00
	Not done by the CB	0.00
c.	Interest rate	
	Interest rate setting and managed by CB	1.00
	Not done by the CB	0.00

4.	**EXCHANGE RATE POLICY (CBIGForx)**	
a.	Intervention of the foreign exchange market is decided by whom	
	Central Bank	1.00
	Jointly	0.50
	Government	0.00
b.	Foreign exchange market regulations done by whom	
	Central Bank	1.00
	Jointly	0.50
	Government	0.00
c.	Foreign exchange borrowings are decided by whom	
	Central Bank	1.00
	Jointly	0.50
	Government	0.00
5.	**MONETARY POLICY AND DEFICIT FINANCING (CBIGMonPol)**	
a.	Who is responsible for monetary policy formulation	
	Bank alone	1.00
	Bank participates, but has little influence	0.67
	Bank only advise government	0.33
	Bank has no say	0.00
b.	Who has the final word in resolution of conflict?	
	The Bank, clearly defined in the law	1.00
	A council of the central bank, executive branch, and legislative branch	0.50
	Government and Executive branch	0.00
c.	Lending to the government	
I.	Lending	
	Not permitted	1.00
	Permitted, but with strict limits (e.g. up to 15% of government revenue)	0.67
	Permitted, and the limits are loose (e.g. over 15% of government revenue)	0.33
	No legal limits on lending	0.00
II.	Terms of lending	
	Controlled by the bank	1.00
	Specified by the bank charter	0.67
	Agreed between the central bank and executive	0.33
	Decided by the executive branch alone	0.00
III.	Maturity of loans	
	Within 6 months	1.00
	Within 1 year	0.67
	More than 1 year	0.33
	Not mentioned in the law	0.00
IV.	Interest rates on loan must be	
	At market rates or above minimum rate	1.00
	Below market rate	0.67
	Interest rate is not mentioned	0.33
	No interest on government borrowing	0.00

6.	ACCOUNTABILITY AND TRANSPARENCY (CBIGAccTrans)	
a.	Objectives of the bank has the following features	
	Written objectives	1.00
	Clear priorities	1.00
b.	Communication strategy	
	Policy Explanations provided for public	1.00
	Press conference/ media release	1.00
	Publication of minutes of Board meeting	1.00
c.	Reporting of banking activities publicly	
	Periodic report publication	
	Yes published	1.00
	No	0.00
d.	Accountability of the Governor/ CEO	
	Accountable to the Board	1.00
	Accountable to Parliament	0.50
	Accountable to Government	0.00
e.	Is the central bank activities are audited?	
	Yes	1.00
	No	0.00

Appendix: 2 Variables description

Variables of CBIG Index	Comment
1. Term of office of Governor/ CEO	Longer than the government's term
2. Legal power to appoint Governor/ CEO	Bank board or parliament not government
3. Legal power to dismissal of Governor/ CEO	No provision of dismissal, if not, then not by the government
4. Legal responsibility of regulating other banks	Separated
5. Turnover of Governor: Political or non political	Political, if changed within six months after change in government
6. Member of the management board of the bank	Members are independent not direct government ministers or officers
7. Does CEO/Governor hold other office in the government?	Should not hold
8. Objectives of the bank includes price stability	Priority on price stability should be highest
9. Inflation targeting	Should have targeting framework in place by central bank
10. Interest rate setting and management	Central Bank should intervene not government
11. Intervention on the foreign exchange market	Central bank should do independently not by government influence
12. Foreign exchange control	Central bank should do independently not by government influence
13. Foreign exchange borrowings	Central bank should do independently not by government influence
14. Responsible for monetary policy formulation	Central bank should formulate
15. Final word in resolution of conflict	Central bank not government
16. Lending to the government permitted or not?	Should not be permitted, if permitted, strict limit is better
17. Terms of lending	Terms should be specified by bank charter
18. Maturity of loans	Lower the maturity is better
19. Interest rate on loan	Market rate or higher
20. Written Objectives	All objectives of bank should be written
21. Priorities in objectives	Priorities in objective should be written
22. Policy explanation	Providing policy explanation is a legal requirement
23. Press or media release	Public should be notified about the development and changes
24. Publications of minutes	Board meeting minutes should be published
25. Publication of economic data and reports	Annual report and others
26. Accountability of the Governor/CEO	To the board or parliament but not to the government
27. Audit of activities	Regular audit should be done