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Central Bank Independence and Democracy: Does Transparency Matter?

Asmaa Mohamed Ezzat and Mona Esam Fayed

ABSTRACT

Securing central bank independence (CBI) is considered a vital and common practice in a large number of countries, since this independence is often associated with favorable economic performance, and it isolates monetary policy from the distortions of political business cycles, associated with electoral business or partisan cycles. However, one criticism against CBI is the seemed contradiction between independence and democracy, known as the problem of accountability of the monetary authority. Thus, this study empirically examines the potential effects of central bank transparency and independence on democracy. This would, in turn, attribute to reconciling the presumed contradiction between CBI and democracy, besides disentangling the impact of independence and transparency on democracy. To this end, we regress democracy on both CBI and CB transparency, besides some control variables, for a sample of 100 central banks in year 2010. The preliminary results indicate that CBI is conducive to democracy. However, this relationship is dependent on the level of CB transparency, where high levels of transparency could reverse this positive relation and make CBI an obstacle in face of democracy. Furthermore, CB's transparency is always associated with more democracy, but increasing the level of CBI reduces this positive impact.

KEY WORDS:

Central Bank Independence, Transparency, Democracy.

JEL Classification: E58, K00, P48.

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1. Introduction

Securing Central Bank Independence (CBI) has become a common practice in a large number of countries since mid-1980s. At the same time, the number of countries operating on democratic principles has increased. The defense of CBI is based on both theoretical and empirical foundations. On the empirical side, studies have revealed that this independence would be associated with favorable evolution of certain economic variables, without any loss in the real product; including inflation, output growth, disinflation effort costs (sacrifice ratio), inflation benefits, productivity

growth, private investment, unemployment, real interest rates, product and inflation trade-off, fiscal deficit, and high-powered money growth (Berger et al., 2000; Eijffinger and De Haan, 1996). From the theoretical standpoint, CBI emerges as a solution to three related problems. Firstly, limiting the dominance of the fiscal authority over the monetary one (Sargent and Wallace, 1981). Secondly, CBI isolates monetary policy from the distortions of political business cycles, associated with electoral business or partisan cycles (Hibbs, 1977; Lindbeck, 1976; Nordhaus, 1975). Finally, delegation of the monetary policy to an independent institution reduces or even eliminates the dynamic inconsistency of the monetary policy (Barro and Gordon, 1983; Kydland and Prescott, 1977).

On the other hand, one criticism against CBI is the

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seemed contradiction between independence and democracy, known as the problem of accountability of the monetary authorities (Greenspan, 1996; McCallum, 1996; Tobin, 1994). Some economists argued that government policies should be controlled by elected officials, rather than by an elite group that is insulated from the political process (Mishkin, 1999). Besides, several empirical studies found a clear negative correlation between CBI and its accountability (Briault et al., 1996; De Haan et al., 1998; Nolan and Schaling, 1996).

From a political science and democratization perspective, most of democracy and democratization literature argue that free and fair elections are considered only the minimal requirements of democracy. For liberal democracies where individual freedoms are guaranteed by the state, horizontal accountability is required. Elected authorities must be checked and balanced by independent state institutions to prevent transgressions and right violations. The judiciary and legislature are among the most important ones of these independent institutions, but central banks are considered as one of them too by some studies. Independence of state institutions, including central banks, limits elected authorities' capacity to pursue policies that seek short term popularity among their key constituencies and thus allow reelection, sacrificing long term interest of the broader society or short term interests of minorities (Isbester, 2011; Plattner et al., 1999).

However, other interdisciplinary works, combining the work of economists and political scientists, have denied the existence of such contradiction in the actual organization of democratic societies (Cama and Pittaluga, 1999). They argued that democracy does not simply require that decision-making reflect the preferences of the majority (Rousseauian tradition). It further requires the protection of the citizen against the abuses made by those in power, including the democratically elected representatives (Madisonian tradition). Accordingly, CBI is expected to foster democracy.

In order to resolve this conflict, it is often suggested to increase *de jure* and *de facto* accountability in order to improve CBI. In this case, "Accountability can thus be seen as a complement, if not a necessary requirement, for independence" (Bini Smaghi, 1998). *De jure*

accountability relates to imposing legal requirements for the central banks which enable better monitoring of policy decisions and establishing objectives prioritization. An easier task, than changing the law, would be to increase *de facto* accountability through *de facto* transparency. As a result, with central banks becoming more independent, both the supply of and demand for their transparency seem to have increased (Blinder et al., 2001; Faust and Svensson, 2001; Geraats, 2002). On the central banks' side, they attempted to increase monetary policy effectiveness by using communication and transparency practices to shape expectations of future policy decisions and hence influence rates across the term structure (Crowe and Meade, 2008). The demand for transparency also increased, both for reasons of accountability and legitimacy. Furthermore, with the evolution of the recent inflation targeting approach, the role of transparency in monetary policy was underlined. According to this approach, the monetary authorities can enjoy full discretion in the choice of the analytical model to be used to define monetary interventions. Yet this discretion must be constrained by transparency, not only in the openness, but also in the ease of understanding available information. This kind of transparency allows the elected bodies to exert a democratic control on the conduct of monetary policy.

Transparency, as one aspect of accountability, and independence are likely to be related attributes of central banks (Dincer and Eichengreen, 2014). However, disentangling their impact remains a difficult task. Furthermore, both concepts are closely related to the concept of democracy. Accordingly, the main objective of the present study is to empirically examine the potential effects of central bank transparency and independence (CBI) on democracy and thus attributes to reconciling the presumed contradiction between CBI and democracy. This is done by regressing democracy on both CBI, as well as transparency, besides some control variables, to assess whether CBI and transparency significantly correlate to democracy. Moreover, we include an interaction term between CBI and CB transparency to test whether the relation between democracy and CBI depends on the level of CB transparency. CBI and transparency are measured using the indices constructed and used by Dincer and Eichengreen (2014) that cover more than 100 central banks during

the period (1998 – 2010). We measure democracy by an index which is the average of the Polity IV democracy index and the Freedom House democracy index. To the best of our knowledge, there have been no empirical studies that tackled the role of transparency as a factor that affects the relation between democracy and CBI. Most of previous empirical literature focused only on the economic impacts of CBI and transparency. Thus, it is believed that this study will contribute, with a preliminary value added, to the empirical literature on the political and institutional effects of CBI and transparency.

The rest of the study will be divided as follows: Section 2 highlights the various measures of CBI and transparency used in previous literature. Section 3 reviews the empirical literature tackling the relation between these two concepts of interest, namely CBI and transparency, on one hand, and democracy on the other. Section 4 investigates the association between these two variables with democracy across the sample under study, as well as countries categorized by level of income and institutional quality. Section 5 is concerned with the regression model. Finally, Section 6 concludes.

2. CBI and Transparency: Determinants and Measures

This section highlights the various determinants and measures of CBI and transparency used in previous literature.

2.1. Determinants and Measures of CBI

CBI relates to four areas, in which the influence of government should be minimized, namely; personnel, policy objectives, policy instruments and financial independence (Eijffinger and De Haan, 1996). It is worth noting that the effective degree of independence depends on the relative strength of the central bank, as well as the political and social environment, besides the legal framework.

Personnel Independence is concerned with limiting the role of government in appointing or dismissing the central bank's governor and board, presetting and legally defining the term of the governor and board, as well as restricting the representation of the government on the board of governors.

Policy Objectives (or Goal) Independence is

the power of central banks to define the level of the objective-variables of economic policy. This kind of independence is seldom given to central banks. Policy objectives are usually set by elected bodies. However, the primary monetary objective is either constitutionally entrenched or cannot be frequently reassessed by an incumbent government, in order to guarantee CBI in this respect.

Policy Instruments Independence refers to the central bank's ability to use the tools and methodology that it perceives appropriate to pursue its targets and objectives.

Financial Independence curtails the interdependence of the government and central bank in budgetary matters. It limits the central bank lending to the government or interference in setting the fiscal policy. It also accounts for whether the central bank's budget is subject to executive or legislative decisions. In practice, it requires that these CBI features be constitutionally established or codified by central bank statutes.

2.1.1. Different measures of CBI

Several measures of central bank independence (CBI) have been proposed in the literature (Alesina, 1988 and 1989; Alesina and Summers, 1993; Bade and Parkin, 1982 and 1988; Crowe and Meade, 2008; Cukierman, 1992; Cukierman, Webb and Neyapti, 1992; Eijffinger and Schaling, 1992 and 1993; Fry et al., 2000; Grilli, Masciandaro, and Tabellini, 1991; Jacome, 2001; Jacome and Vazquez, 2008). Although most of these measures are based on a similar approach, they may differ in some aspects which may result in different outcomes. In general, higher values in all of these measures indicate higher degree of central bank independence.

Bade and Parkin (BP) (1982; 1988) underwent a pioneering attempt to classify central banks of 12 advanced economies, by investigating the laws that establish and govern the central bank to determine: 1) whether the government or the central bank is the final monetary policy authority, 2) whether any government officials are members of the central bank board, 3) and whether the government appointed all or only some of the board members. Based on these criteria, central banks were classified into four types (least independent, second least independent, second most independent, and most independent).

Alesina (1988; 1989) extended the work of BP, and added a fourth criterion to the three mentioned

above. This fourth indicator was the extent to which the CB is compelled to buy the Treasury bill surplus - a means by which the CB offers credit to the government. Also, Alesina extended the sample and used the BP classification, but as a cardinal index, by assigning a value to each type: 1 for the least independent to 4 for the most independent.

Grilli, Masciandaro and Tabellini (GMT) (1991) provided the first comprehensive coding of central bank laws for a group of 18 advanced economies for the period (1950-1989) and constructed the first CBI Index. Their index, which ranges from zero (least independent) to 16 (most independent), is divided into two sub-measures for CBI (Parkin, 2012). The first measures political independence and it focuses on appointment procedures for board members, the length of members' terms to office, and the existence of the statutory requirement to pursue monetary stability. The second measures economic independence and it focuses on the extent to which the central bank is free from government influence in implementing monetary policy. The total score of these two sub-measures is employed as an indicator for legal independence (Eijffinger and De Haan, 1996).

Eijffinger and Schaling (ES) (1992; 1993) constructed a CBI index based on the same criteria used by BP. Their contribution was that their index takes into consideration the "Twin-Authority" case where the authority of formulating the monetary policy is distributed between the CB and the government. On the other hand, Alesina and Summers (AS) (1993) combined Alesina's BP index with the GMT political independence index to create their own CBI index.

Cukierman's (1992) and Cukierman, Webb, and Neyapti (CWN) (1992) constructed another index that is aggregated from 16 legal characteristics of central bank charters, and were similar in scope to those of GMT. These 16 characteristics are grouped into 4 components, relating to, appointment procedures for the head of the central bank, the resolution of conflict between the central bank and the executive branch of government, the use of an explicit policy target, and rules limiting lending to government. CWN gave weights to each variable in each component to combine them in a single CBI "legal variables index" that ranges from 0 (not independent) to 1 (most independent). Its principal advantage is that it is computed for a large and

comprehensive set of countries, including developing economies, allowing for comparison over time.

Fry et al. (2000) built on and extended further the ideas of GMT and Cukierman. They provided an overall measure of independence relying on central banks' characteristics covering legal objectives, goals, instruments, finance of the government deficit, and term of office of the CBI Governor (Parkin, 2012).

Jacome (2001) and Jacome and Vazquez (2008) extended the Cukierman index to a (regional) sample of developing countries during the 1990s, keeping track of CBI during the pre- and post-reform periods. Also, it took into account the effects of broader structural reform policies that usually go along with changes in central bank legislation. This Jacome's CBI index not only integrates the economic and political criteria used in other legal indices, but also includes other criteria such as financial autonomy, transparency, accountability and lender of last resort mechanism, which makes it one of the most comprehensive legal indices (Farrag and Kamaly, 2007).

Moreover, Crowe and Meade (2008) applied the criteria developed by CWN. They used information on central bank laws from a database held by the International Monetary Fund (IMF) to update the CWN's index. Their measure covered 99 countries in 2003.

Furthermore, Dincer and Eichengreen (2014) augmented CWN's criteria, by adding other aspects of CBI. These include, measures of limits on the reappointment of Chief Executive Officer (CEO), measures of provisions affecting (re)appointment of other board members similar to those affecting the CEO, restrictions on government representation on the board, and intervention of the government in exchange rate policy formulation. This is the measure that we will use in our qualitative and empirical analysis.

It is worth noting that all of the above-mentioned indices are considered measures for the *de jure* CBI, as they are based on the interpretation of the legal charter of central banks. However, actual or *de facto* CBI depends not only on the law, but also on many other less structured factors, such as informal arrangements between the CB and other parts of the government, the quality of the CB's research department, and the personal characteristics of key individuals in the CB. To this end, Cukierman (1992) and Cukierman, Webb, and Neyapti (1992) tried to differentiate

between legal independence and what they call “actual independence”. They conducted a survey of “qualified individuals in various central banks” inquiring about information on nine variables analogous in scope to those for legal independence. The responses were used to construct a CBI “questionnaire variables index” (QVA) that ranges from zero to one. Besides, CWN (1992) measured actual independence by the turnover rate of central bank governors (TOR), where more rapid turnover of CB governors indicates a lower level of independence. But there was often difficulty in quantifying such features in an unbiased manner, which led most studies to depend only on legal CBI measures (Eijffinger and De Haan, 1996).

2.2. Determinants and Measures of Transparency

Enhancing transparency of monetary policymaking is considered an important factor in promoting central bank accountability. It is worth noting, however, that there is no consensus view regarding the precise definition of transparency (Crowe and Meade, 2008). Issing (1999) defines transparency as the explanation of monetary policy decisions to the public. Buitier (1999) refers to the necessity of explaining both the process of decision making, as well as its outcomes, to enhance transparency. In general, however, central banks need to clearly convey to the public objectives and instruments of their monetary policy strategy. This could be pursued through various outreach vehicles to communicate with the public, including providing speeches to all elements of society, more openness with the press and media, and the development of brochures and reports that are accessible to the public (Mishkin, 1999).

Transparency of the monetary process is often analyzed through five main aspects related to the different parts of the policy making process (Eijffinger and Geraats, 2006; Geraats, 2002). Political Transparency is concerned with whether the specification of roles and responsibilities, between the government and the central bank, is transparently codified and embodied in measurable objectives of the central bank. Economic Transparency requires the release of economic information by the central bank, including data, models and forecasts, to facilitate decision making of the private sector. Procedural Transparency is concerned with the

internal decision-making of the central bank. Central banks are required to publish information about the way decisions are made. This is done through providing transcripts, minutes or voting decisions of the relevant policy committees. Policy Transparency is the openness about the policy implications, through prompt announcements and explanations of decisions. Finally, Operational Transparency is concerned with assessing the transmission of the policy decision in practice. This is especially revealed through the central bank publishing information on the monetary transmission mechanism, assessing the accuracy of its past forecasts and accounting for past errors in policy or unanticipated economic shocks.

2.2.1. Different measures of CB Transparency

In addition to qualitative descriptions of CB transparency offered by different studies (e.g. Bernanke et al., 1999; Blinder et al., 2001; Leiderman and Svensson, 1995), there were some attempts to provide quantitative measures to be used for formal econometric analysis. The indices for measuring CB transparency have been considered several years after those of CBI. They reflect the amount of information released by the central banks, the quality and clarity of this information, the complexity of the central banks' websites, as well as the degree of openness regarding the financial markets, media and the wide public (Dumiter, 2014).

The first attempt in measuring central bank transparency was done by Fry et al. (2000). They conducted a comprehensive survey of 94 central banks that covered a wide variety of aspects ranging from institutional characteristics to policy focus and monetary analysis. They measured CB transparency as an equally weighted average of three sub-indicators: 1) whether the central bank provides quick public explanations of its policy decisions; 2) the frequency and form of forward-looking analysis provided to the public; 3) and the frequency of bulletins, speeches, and research papers. One limitation for this index is its relatively coarse definition of transparency. Then, Siklos (2002) provided similar measures of CB transparency for 20 OECD countries but only at one point in time, the late 1990s. He offered 11 variables regarding the supply of information, the understanding of the monetary policy process, procedural transparency

and central bank autonomy and responsibility.

Moreover, Stasavage (2003) constructed an index for CB transparency based on a questionnaire related to four aspects. They included: the publications form of forecast, the publication of the forward-looking analyzes, publishing the forecast risks, and the discussion about the past forecast errors. Furthermore, De Haan and Amtenbrink (2003) created an index based on three main pillars: objectives (clear objectives, clear definition, clear priorities, clear time horizon, quantification), strategy (publication of strategy, immediate announcement and explanation of interest rate decision, inflation forecast), and communication strategy (parliamentary hearings, frequency of reports, meeting schedule, press conferences/press releases, publication of minutes, publication of individual votes).

Eijffinger and Geraats (2006) distinguished more aspects of transparency. They constructed an index for CB transparency that covered the five aspects of transparency previously mentioned, (1) political, (2) economic, (3) procedural, (4) policy, and (5) operational transparency. Each dimension is divided into three sub-categories. Their overall index sums values across these five dimensions, each of which is in turn an equally weighted average of its sub-dimensions. They considered more than one point in time and used a normalization technique, thus, making the index range from 0 (the minimum) to 1 (the maximum). Strength of this index lies in using a comprehensive, multi-dimensional definition of transparency. However, it is constructed for just 9 central banks, which represents its main drawback.

Crowe and Meade (2008) also constructed indices of CB transparency that broadly followed the methodology of Eijffinger and Geraats (2006). They reported and compared transparency of 37 central banks in 1998 and 2006.

Dincer and Eichengreen (2008, 2010) replicated and extended the work of Eijffinger and Geraats (2006). They provided an overall transparency index, which is calculated as the sum of the scores for 15 sub-indices (min = 0, max = 15). It covered 100 central banks from 1998 to 2005 and 2006, respectively. Then, Siklos (2011) updated the same transparency indices through 2009. Finally, Dincer and Eichengreen (2014) updated this transparency index, to cover 120 central banks for every year from 1998 through 2010.

3. CBI, Transparency and Democracy: Empirical Evidence

The prominent problem in most empirical studies tackling CBI and/or transparency was the choice of the appropriate index which accurately measures the concept of interest. However, our main focus in this section is to review the empirical studies that reported the direction of the relationship between the variables of interest, namely CBI and transparency, on one hand, and democracy on the other, regardless of the indices used.

3.1. CBI and Transparency

CBI and transparency are considered two dimensions of monetary policy arrangements, which are usually difficult to distinguish between. Increased transparency of monetary policymaking is considered one important way of increasing central bank accountability (Mishkin, 1999). Transparency and accountability, in turn, increase support for independence of the central bank.

Empirically, Briault et al. (1996) found an inverse statistically significant relationship between central bank accountability and goal independence in 14 central banks. Using the Briault et al.'s accountability index, Nolan and Schaling (1996) found a negative correlation between CBI and accountability as well. De Haan et al. (1998) made simple regressions of CBI on accountability aspects for a sample of sixteen central banks. They reported a positive, however weak, relationship between CBI and the 'objectives' accountability aspect, and negative relationships between CBI and the other two accountability aspects – 'transparency' and 'final responsibility for monetary policy', the latter being the more significant. Furthermore, they presented evidence for a weak negative relationship between CBI and accountability. Sousa (2002) re-examined the relationship between CBI and accountability after reading and analyzing the statutes of 33 central banks and applying alternative legal CBI index and the De Haan et al. (1998)'s accountability index. However, these improvements did not change the established results of the negative correlation between CBI and accountability.

However, Crowe and Meade (2008) examined the current level of CBI and transparency in a broad sample of countries using newly constructed measures. They, then, regressed the level of transparency in 2006 on the level of CBI and a vector of controls. They found that

independence affects transparency positively, as do the flexibility of the exchange rate regime and measures of institutional quality. Moreover, Dincer and Eichengreen (2014) found that CBI and transparency moved together using data for 120 central banks over the period 1998 through 2010. They responded to similar economic and institutional determinants. Transparency was found to rise in countries with deeper financial markets and its trend was positively affected by the strength of political institutions, however, this was not the case for CBI.

3.2. *The Democracy Dimension*

The recent rise of populism and populist reversals of democracy throughout the world demonstrated that democracy without checks and balances cannot survive too long. Populist leaders from Latin America to Europe and Asia came to power through relatively free elections and began expanding their powers vis-à-vis other state institutions, eroding checks and balances. Their justification has been that non-elected institutions violate democracy and that they represent elite interests instead of majorities. In cases where they convinced their voters, political systems transformed quickly towards centralization around executive office. However, evidence has shown that democracies without checks and balances, or “illiberal democracies” as some scholars and politicians define them, do not survive too long. In the absence of independent state institutions where all state power concentrates on elected authorities, political leaders’ future increasingly depends on the continuity of their office. Life after possible loss of office becomes unpredictable and risky. Thus, leaders cannot risk loss of office and finally begin limiting electoral freedoms, which is when we can no longer talk about a democracy (Bugarcic, 2017; Zakaria, 1997).

Accountability and independence concepts, on the other hand, are argued to be closely related to the democracy concept. Enhancing transparency, as a mean of enhancing de facto accountability, was argued to solve the conflict between CBI and accountability, thus, reconciling CBI and democratic principles (Sousa, 2002). However, the question of whether central bank transparency delivers tangible benefits is an empirical one. Democracy appeared in regressions as a determinant of reforms to CBI (Crowe and Meade, 2008). However, it proved to be an insignificant factor. To the best of our knowledge, no empirical study tackled the pos-

sible causal relationship that goes the other way around. That is, the effect of CBI on the democratic stance of an economy, and whether incorporating transparency in the model would make a difference. Accordingly, this would be the main contribution of the study at hand.

4. CBI, Democracy and Transparency: Cross-Country Association Patterns

This section explores the data on CBI, transparency and democracy across countries in our sample, to give preliminary insights into the patterns of association between these variables before proceeding with the empirical analysis through econometric modeling. These patterns are further examined across countries categorized according to level of income and institutional quality.

We use cross sectional data for more than 100 central banks in year 2010. The reason behind the selection of this sample and period of time is data availability, as we strived to use the most recent data available. To measure CBI and transparency we rely on the data provided by Dincer and Eichengreen (2014). As mentioned before, Dincer and Eichengreen’s legal CBI index is based on that of Cukierman, Webb, and Neyapti (1992), but also they added other aspects of central bank independence emphasized in the subsequent literature. Thus, they added measures of limits on the reappointment of the CEO, measures of provisions affecting (re)appointment of other board members similar to those affecting the CEO, restrictions on government representation on the board, and intervention of the government in exchange rate policy formulation. Their index is composed of twenty-four criteria that are aggregated into nine general criteria as follows: (1) The five variables regarding the independence of the CEO are aggregated into one using equal weights; (2) the four variables under policy formulation are aggregated into one using equal weights; (3) the objectives criterion stands on its own as number 3; (4) advances criterion under limits on lending; (5) securitized lending criterion under limits on lending; (6) terms of lending criterion under limits on lending; (7) potential borrowers from the bank criterion under limits on lending; (8) the last four criteria on limits on lending are aggregated into a single variable using equal

weights; and (9) the criteria regarding board members is treated as a single variable. From these nine aggregated variables two indices are computed, the unweighted average of the nine aggregated variables, and the corresponding weighted one. We rely here on the weighted CBI index. It ranges from 0 to 1 (lowest and highest levels of independence, respectively).

Concerning CB transparency, Dincer and Eichen-green's overall transparency index covers the five aspects of transparency, and each aspect consists of 3 questions. Then, the index is calculated as the sum of the scores for answers to these fifteen questions (min = 0, max = 15). They draw their data from information on central banks' websites and statutes, annual reports, and other published documents rather than sending a survey instrument to the central banks themselves and relying on the subjectivity of responding staff.

To measure the level of democracy we rely on an index which is an average for two other democracy indices one issued by Freedom House and the other issued by Polity IV project. The Freedom house index ranges from 1 (most free) to 7 (least free), and it is an average of civil liberties and political rights indices provided also by Freedom House. The polity score ranges from +10 (strongly democratic) to -10 (strongly autocratic). Both the Freedom House and the Polity score are transformed to a scale 0-10 and then they are averaged into one index which ranges from 0 (least democratic) to 10 (most democratic). Hadenius and Teorell (2005) show that this average index performs better, in terms of validity and reliability, than its constituent parts. It is also worth mentioning that we rely on an imputed version for this index, where values for countries where data on Polity is missing has been imputed by regressing Polity on the average Freedom House measure.

Figure (1) is a scatter plot of CBI and democracy for all countries in the sample. It depicts wide dispersion of the sample observations, indicating a relatively weak correlation between CBI and democracy. However, upon plotting the fitted regression line, it turns out to be quite flat but with a positive slope. This could be a sign of the existence of a positive association between the two variables. On the other hand, figure (2) plots CB transparency against democracy. The data points are tighter and clustered

around fitted regression line, which is relatively steeper than the one of the democracy-CBI plot. This indicates a high correlation between democracy and CB transparency in this sample. Moreover, the positive slope of the fitted regression line indicates a positive association between the two variables. Figure (3) shows that the level of CB transparency in most of the countries in the sample is less than 10. It also demonstrates a positive, yet quite dispersed, association between CBI and CB transparency. Thus, based on these three scatter plots, we can tentatively infer that CBI does not contradict with democracy. More CB transparency is expected to enhance the depicted positive association between CBI and democracy, since transparency seemed to be positively associated with both CBI and democracy. This association is noticed to be relatively stronger with democracy, thus ascertaining the idea of transparency allowing elected bodies to exert a democratic control on the conduct of monetary policy.

To have a closer look at the association between CBI and democracy, especially concerning the role of CB transparency as a potential promoting channel for this relationship, we divide our sample into two sub-samples. The CB transparency index used in the study ranges from 0 to 15, so we arbitrarily chose the value of 7 to divide the sample into two subsamples; one including countries with low transparency levels and the other for countries with high transparency levels. The first sub-sample includes countries where the level of CB transparency in 2010 is less than or equal 7, and the second includes those where the level of CB transparency in 2010 is higher than 7. We then draw the scatter plots of democracy and CBI for the two subsamples. It is evident from the two plots [Figure (4) and Figure (5)] that the number of countries with low levels of CB transparency (less than or equal 7) in the sample is higher than those with high levels of CB transparency (higher than 7). Also, in general, the level of democracy is higher in countries with high levels of CB transparency compared to those with low levels of transparency. This again confirms the positive association between democracy and CB transparency. There seems to be a positive association between CBI and democracy in both subsamples, as is evident from the positive slopes of

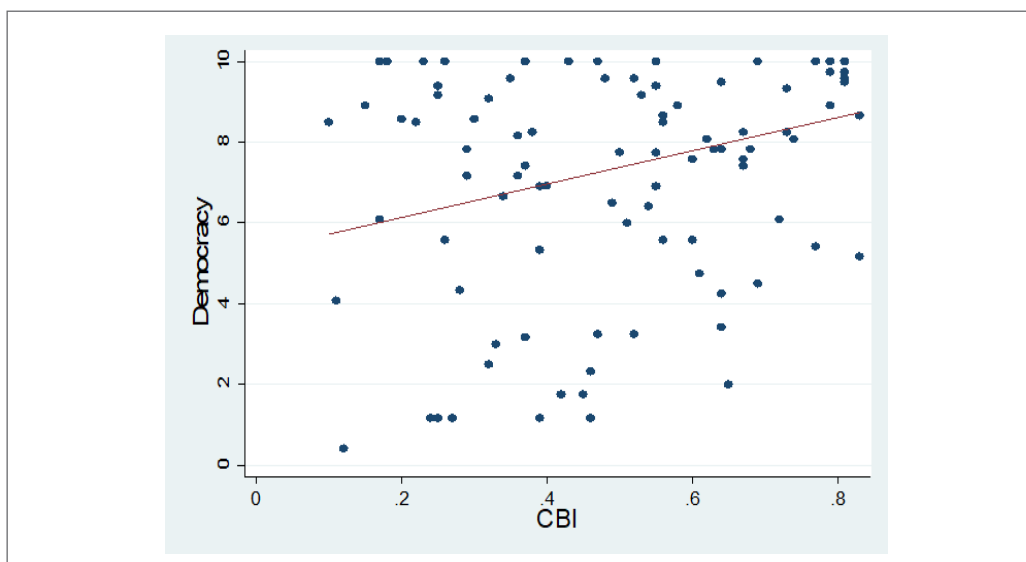


Figure 1. Democracy and CBI in 2010.

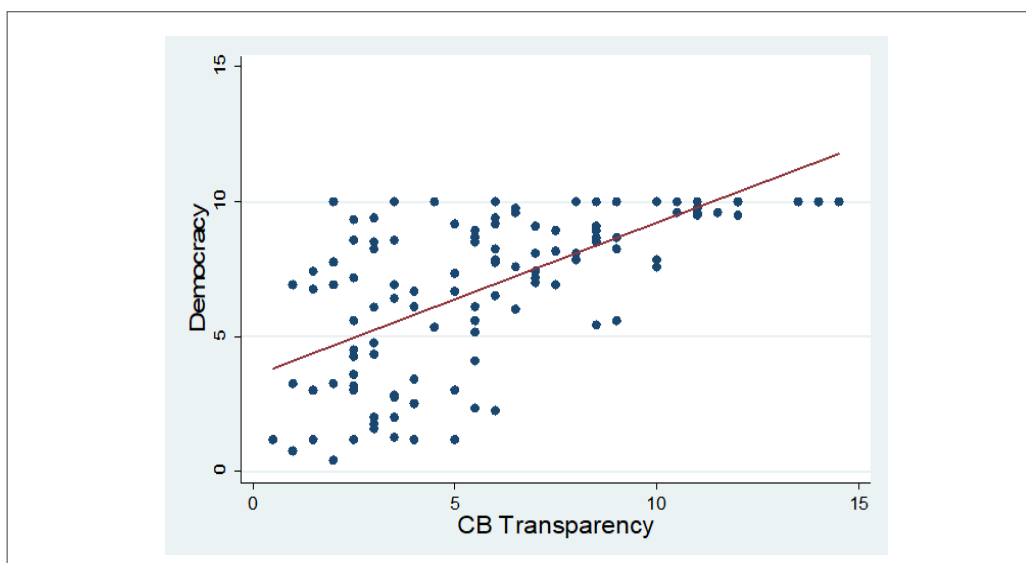


Figure 2. Democracy and CB Transparency in 2010.

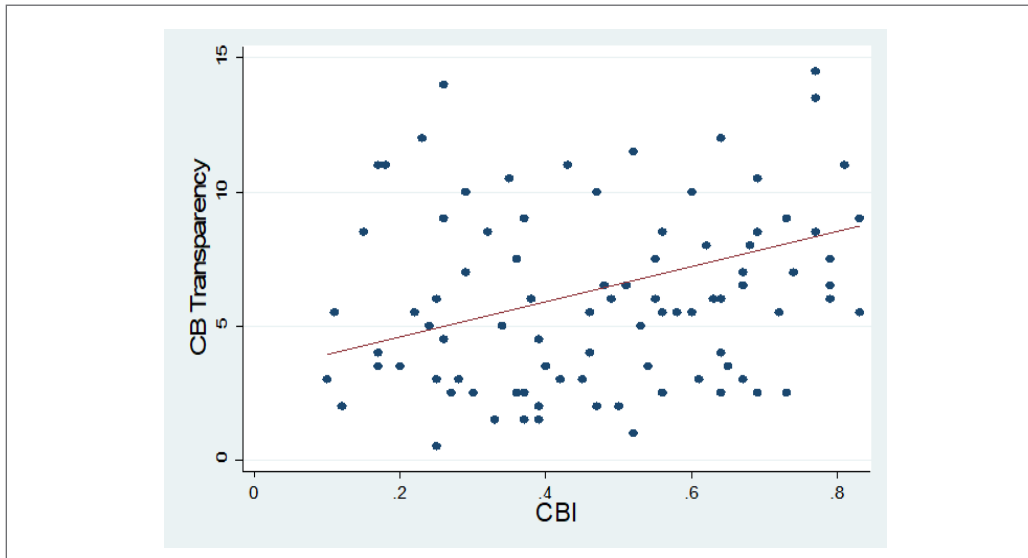


Figure 3. CB Transparency and CBI in 2010.

the fitted regression lines. Nevertheless, the slope of the regression line for countries with high levels of CB transparency is flatter. This implies a relatively more effective role of enhanced transparency, on reconciling the presumed contradiction between CBI and democracy, in countries with less levels of transparency.

We further divide our sample into other sub-samples to check whether the association between CBI and democracy differs due to additional factors, other than CB transparency, including: institutional quality and income level. Firstly, concerning the institutional quality aspect, we use one of the World Bank governance indicators, which is voice and accountability, to account for the institutional environment in the country. Voice and accountability index is a composite indicator that captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. It ranges from -2.5 to 2.5, where higher values indicate better governance. We divide our sample into two subsamples. The first includes countries with low levels of the voice and

accountability index (less than or equal to zero) in 2010. The second encompasses countries with a value greater than zero for this index implying higher levels of institutional quality in this particular aspect. The scatter plot for CBI against democracy for the sub-sample with low levels of institutional quality [Figure (6)] shows that scatter points are more dispersed away from the fitted regression line compared to the other sub-sample [Figure (7)]. In general, the scatter plots show a positive association between democracy and CBI, however, the slope of the fitted line is relatively steeper in the first plot [Figure (6)]. Moreover, the level of democracy is much higher in countries with higher values of voice and accountability index, which is considered a realistic phenomenon. Accordingly, it could be tentatively deduced that enhanced institutional quality is quite more effective in strengthening the positive relationship between democracy and CBI for less democratic countries with relatively low institutional quality.

Secondly, concerning the income level, we divide our sample into a sub-sample including developing countries and another including developed ones.

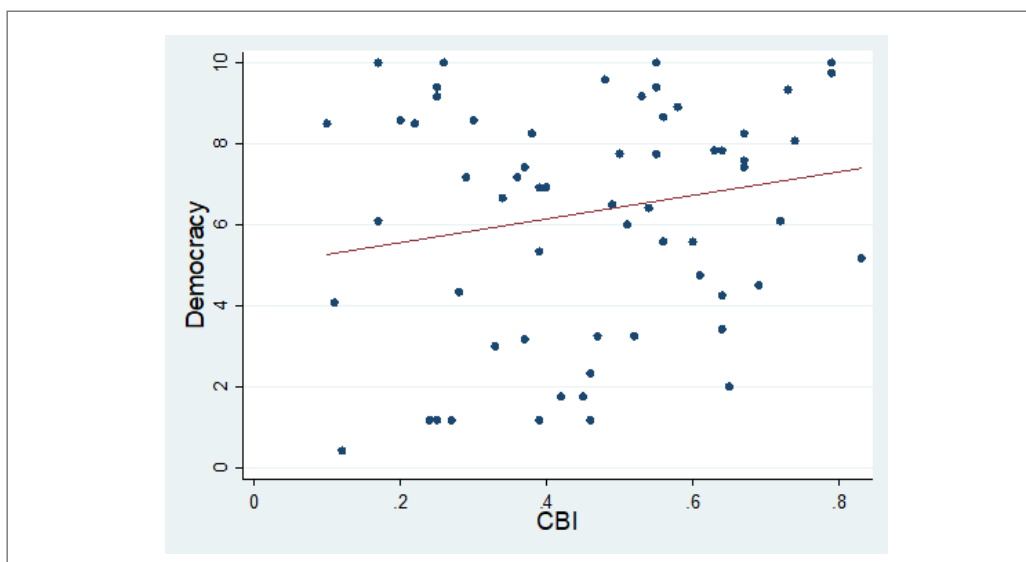


Figure 4. Democracy and CBI in 2010 (CB Transparency less than or equal 7).

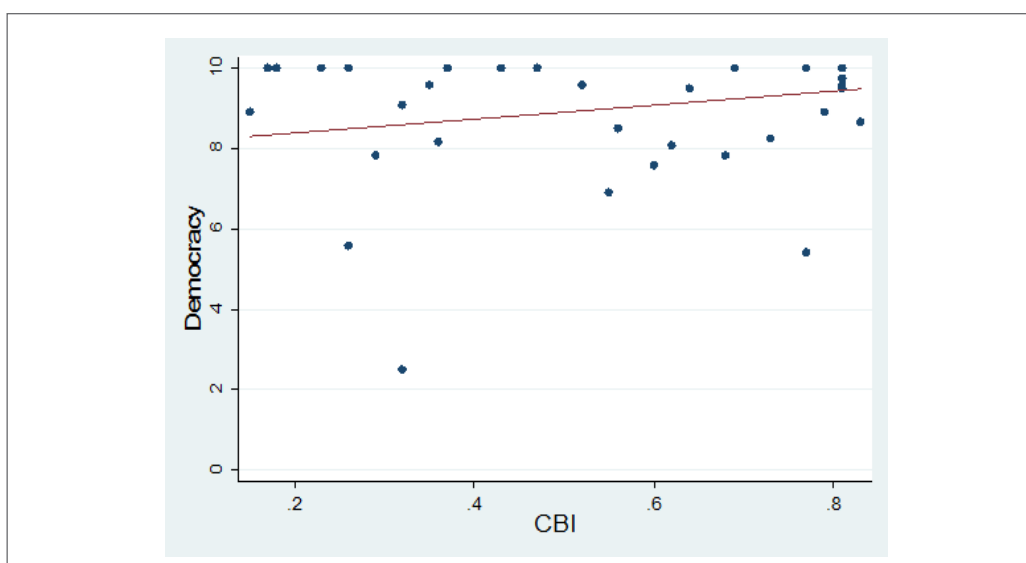


Figure 5. Democracy and CBI in 2010 (CB Transparency higher than 7).

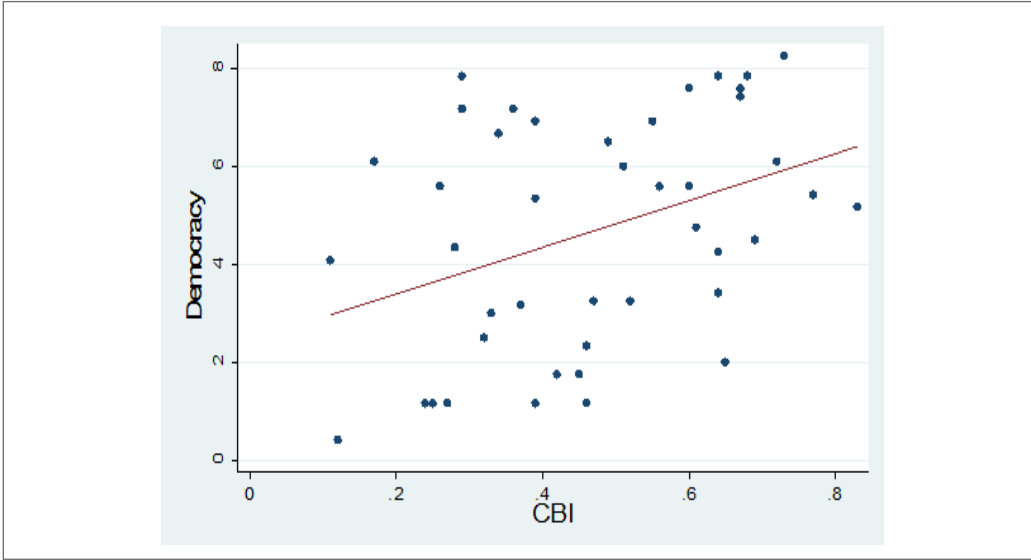


Figure 6. Democracy and CBI in 2010 (voice and accountability Index is less than or equal 0).

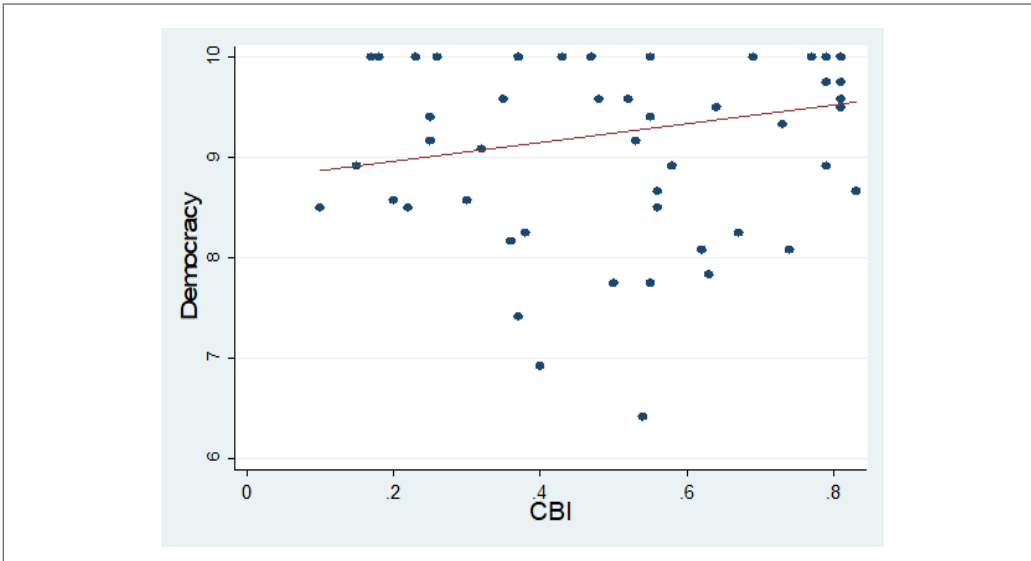


Figure 7. Democracy and CBI in 2010 (voice and accountability index is higher than 0).

The classification of countries to developing and developed depends on the World Bank's classification of countries according to the income level. Developing countries are the low- and middle-income countries, while developed countries are the high-income countries (Webpage: <http://data.worldbank.org/about/country-and-lending-groups>). Figures (8) and (9) indicate that developed countries in our sample are fewer and relatively more democratic than the developing ones – except for some countries, such as Saudi Arabia, Venezuela, United Arab Emirates and Singapore. Both plots show a positive association between CBI and democracy with a positive sloped fitted regression line. However, the slope for developed countries is relatively larger. It could thus be concluded that the positive association between CBI and democracy is clearer and relatively better established among developed countries. Secondly, concerning the income level, we divide our sample into a sub-sample including de-

veloping countries and another including developed ones. The classification of countries to developing and developed depends on the World Bank's classification of countries according to the income level. Developing countries are the low- and middle-income countries, while developed countries are the high-income countries (Webpage: <http://data.worldbank.org/about/country-and-lending-groups>). Figures (8) and (9) indicate that developed countries in our sample are fewer and relatively more democratic than the developing ones – except for some countries, such as Saudi Arabia, Venezuela, United Arab Emirates and Singapore. Both plots show a positive association between CBI and democracy with a positive sloped fitted regression line. However, the slope for developed countries is relatively larger. It could thus be concluded that the positive association between CBI and democracy is clearer and relatively better established among developed countries.

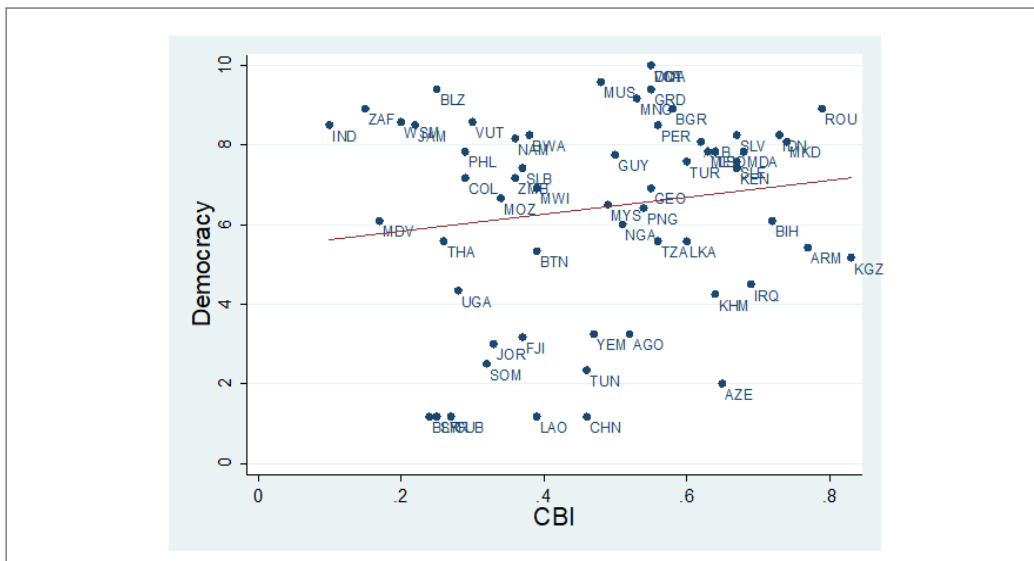


Figure 8. Democracy and CBI in 2010 (developing countries).

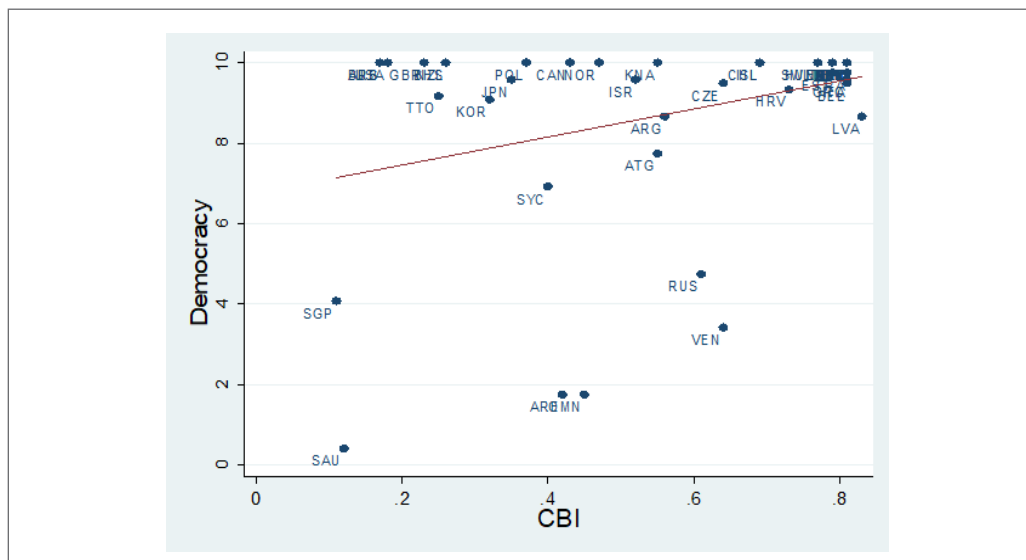


Figure 9. Democracy and CBI in 2010 (developed countries).

To sum up, it is quite evident that the relationship between CBI and democracy is not a standard one, at least with respect to magnitude, among different groups of countries with different levels of transparency, institutional quality and income. The positive correlation between transparency and democracy is relatively more established than that with CBI. Transparency can thus be considered a potential channel through which the presumed contradiction between CBI and democracy is reconciled, particularly for countries with low level of CB transparency. Countries with low levels of institutional quality experience a clearer positive association between CBI and democracy. This is also true for developed countries with relatively better democratic stances.

5. The Model

5.1. Data and Main Variables

Based on the results of qualitative analysis of the data, it appears to be crucial to empirically test the hypothesis that CBI promotes democracy, and that this relationship is dependent on the level of central bank transparency. As we mentioned earlier, we use cross section data for more than 100 central banks

in year 2010. We rely on Dincer and Eichengreen's (2014) data for CBI and CB transparency. In addition, we use the average of the Freedom House and Polity IV indices to measure the level of democracy.

Our model consists of one equation where democracy is the dependent variable and CBI and CB transparency are explanatory ones, as follows:

$$\text{Democracy}_i = \alpha + \beta \text{CBI}_i + \gamma \text{CBT}_i + \delta \text{CBI}_i * \text{CBT}_i + \theta X_i + \varepsilon_i$$

Democracy_i is the level of democracy of country i in 2010. CBI_i and CBT_i are the level of central bank independence and transparency, respectively, in country i for year 2010. We add also an interaction term between the two variables ($\text{CBI}_i * \text{CBT}_i$) to examine if the relation between CBI_i and democracy depends on the level of CB transparency on one hand, and also if the relationship between democracy and transparency depends on the level of CBI, on the other. X_i represents a vector of control variables which include the most prominent determinants of democracy that are used extensively in the literature (Alesina, Baquir and Easterly, 1999; Arat, 1991; Baldwin and Huber, 2010; Barro, 1999; Boix and Stokes, 2003; De Mesquita and

Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Democracy	192	6.688481	3.097623	0	10
CBI	109	0.523578	0.2157224	0.1	0.83
CBT	130	6.315385	3.437221	0.5	14.5
CBI*CBT	108	3.835602	2.939247	0.125	11.165
LogGDPPC	178	8.137611	1.558142	5.015572	11.29323
Schooling	142	4.675268	1.528192	1.035581	8.749359
Urbanization	190	55.70737	23.41845	10.642	100
Oil_income	131	6.445172	12.84575	0	64.14433
Religion_ Catholic	180	31.92	36.05604	0	99.1
Ethnic_ Fraction- alization	186	0.4367866	0.2564579	0	0.930175
British_ Colony	192	0.296875	0.4580754	0	1
Rule_of_Law	192	-0.0704358	0.9919086	-2.44812	1.976779

Smith, 2009; De Mesquita et al., 2003; Diamond, 1992; Feng, 2005; Hadenius, 1992; Hadenius and Teorell, 2005; Inglehart and Welzel, 2006; Lipset, 1959; Lipset and Lakin, 2004; North, Wallis and Weingast, 2009; Przeworski and Limongi, 1997; Przeworski et al., 2000; Ross, 2001). They include economic, social, demographic, institutional and historical variables. The primary source of data for all these variables is the Quality of Government (QoG) Standard Dataset (2015) issued by the QoG Institute – University of Gothenburg (Teorell et al. 2015). Economic factors include country's level of income measured by logarithm of real GDP per capita (measured in constant 2005 US dollar) (*logGDPPC*), and income from natural resources (*oil_income*) measured by the difference between the value of crude oil production at

world prices and total costs of production. In addition, we include variables that are related to economic development (or modernization), that are of particular relevance to democracy, such as level of education in the population (*Schooling*) measured by average years of primary schooling in population aged 25 and above, as well as urbanization rate (*Urbanization*) measured by percentage of total population living in urban areas. Moreover, social and demographic characteristics include, the ethnic fractionalization structure of the country (*Ethnic_Fractionalization*) measured by ethnic fractionalization index, which reflects the probability that two randomly selected people from a given country will not share the same racial and linguistic characteristics. The higher the number the less probability of the two sharing the same characteristics.

Also, we incorporate an indicator for religion (*Religion_catholic*) measured by the percentage of Catholic in total population of a country in 1980. As for the historical characteristics, we include a dummy variable (*British_Colony*) that takes the value 1 if a country was a former British colony and 0 otherwise. Finally, we add an index for rule of law (*Rule_of_Law*), which is one of the World Bank governance indicators, to account for the institutional environment in the country, where higher values indicate better implementation for rule of law. ε_i is the error term for country i . Summary statistics and correlation matrix for all variables used in the model are reported in Table 1 and 2, respectively.

5.2. Results and Analysis

Table 3 displays six empirical models designed to test our hypothesis. We start with a baseline model regressing democracy on CBI only, where no other additional control variables are included. The results of this simple model are reported in the first column of Table 3. We find that CBI is significantly related to democracy. The positive coefficient for CBI indicates that countries that enjoy higher level of independence for their central bank experience a better level of democracy. In model 2, we add CB transparency as another explanatory variable. The results in column 2 indicate a significant positive link between CB transparency and democracy level at all significance levels. We further observe a substantial

Table 2. Correlation Matrix of Variables Used in the Model

	Democracy	CBI	CBT	CBI_CBT	LogGDPPC	Schooling
Democracy	1.0000					
CBI	0.3194*	1.0000				
CBT	0.6625*	0.4099*	1.0000			
CBI*CBT	0.5569*	0.8009*	0.8261*	1.0000		
LogGDPPC	0.4339*	0.1630	0.6005*	0.5079*	1.0000	
Schooling	0.5159*	0.1303	0.4561*	0.3160*	0.6350*	1.0000
Urbanization	0.2459*	0.1682	0.4144*	0.3821*	0.7448*	0.4365*
Oil_income	-0.5479*	-0.1396	-0.4443*	-0.3776*	0.0187	-0.2472*
Religion_Catholic	0.4171*	0.2845*	0.2550*	0.2969*	0.1729	0.2239*
Ethnic_Fractionalization	-0.3346*	-0.2072	-0.3225*	-0.3412*	-0.4559*	-0.4192*
British_Colony	-0.0834	-0.3699*	-0.4077*	-0.4592*	-0.0705	-0.1046
Rule_of_Law	0.6328*	0.1548	0.6657*	0.5296*	0.8143*	0.5213*

Table 2. Correlation Matrix of Variables Used in the Model (Continued)

	Urbanization	Oil_income	Religion_ Catholic	Ethnic_Frac- tionalization	British_Colony	Rule_of_Law
Urbanization	1.0000					
Oil_income	0.0579	1.0000				
Religion_ Catholic	0.2006*	-0.0979	1.0000			
Ethnic_Frac- tionalization	-0.1957*	0.2664*	-0.1048	1.0000		
British_Col- ony	-0.2716*	0.1462	-0.2554*	0.0636	1.0000	
Rule_of_Law	0.5034*	-0.2809*	0.1362	-0.4313*	0.0156	1.0000

Note: (*) indicates 0.01 significance level.

reduction in the magnitude of CBI coefficient and it became as well insignificant. This suggests that the largest part of the positive association between CBI and democracy can be attributed to CB transparency.

In model 3, we augment model 2 by adding an interaction term between CBI and transparency. Furthermore, in model 4, beside adding the interaction term we incorporate other control variables representing some economic determinants of democracy (GDP per capita and oil income in the country) as well as variables related to economic development and modernization (*Schooling* and *Urbanization*). The results in both models (columns 3 and 4) remain the same as in model 2. CB transparency is significantly and positively linked to level of democracy and CBI has no significant impact. In addition, the interaction term in both models is insignificant. Also, the results in model 4 indicate that income is a positive significant determinant to level of democracy, while oil income is negatively related to democracy level, and schooling as well as urbanization show insignificant impact on democracy.

In model 5 we add three more control variables, in addition to those used in model 4, to account for

demographic and historical characteristics of the country (*Ethnic_Fractionalization*, *Religion_Catholic* and *British_Colony*). CB transparency remains positively and significantly related to democracy level at all significance levels regardless of the level of CBI. But the magnitude of this positive impact decreases with the increase in the level of CBI. As for CBI, the results changed dramatically. CBI is now positively and significantly related to the level of democracy at 10% significance level, but only at low and moderate levels of CB transparency. If CB transparency index is higher than about 10.3, CBI would have a negative impact on democracy, since the interaction term between CBI and CB transparency has a negative and significant coefficient at 10% significance level. These results indicate that the relation between CBI and democracy hinges upon the level of transparency. At higher levels of transparency there appears to be lower positive or even negative association between CBI and democracy. According to Sousa (2002), increasing transparency could be regarded as an implicit mechanism of commitment which enhances monetary policy credibility, thus requiring even less necessary independence for the central bank.

In this case, further CBI is expected to be of lower or even devastating effect on democracy. As for determinants of democracy, level of schooling and urbanization remain insignificant and income, as well as, oil income remains to be significant and have the same signs as in model 4. In addition, among other determinants added in this model, only the variable of (*Religion_catholic*) is significant at 5% significance level, while other variables (*Ethnic_Fractionalization* and *British_Colony*) are insignificant, but they have the expected signs as suggested by literature.

Finally, in model 6, the variable (*Rule_of_law*) is added to account for the institutional environment. Results of this model resemble that of model 5 regarding CBI, transparency and their interaction term. The coefficients of CBI and the interaction term are even now significant at 5% significance level instead of 10%. The only significant determinants of democracy, in this model, are the percentage of catholic in total population (*Religion_catholic*) and rule of law indicator (*Rule_of_law*), with both having significant positive coefficients.

Table 3. OLS Estimation Results

Dependent Variable: Democracy						
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
CBI	4.125843*** (1.202408)	0.587916 (0.9904224)	1.885947 (3.112295)	5.808312 (3.501119)	6.338676* (3.399193)	7.229767** (3.225671)
CBT		0.512341*** (0.0567115)	0.5994887*** (0.1686625)	0.6448185*** (0.2141185)	0.7258268*** (0.2131934)	0.7126636*** (0.199166)
CBI*CBT			-0.1715162 (0.3060331)	-0.5305512 (0.3330839)	-0.6165228* (0.3188502)	-0.6921783** (0.3049272)
LogGDPPC				0.5257573** (0.2447413)	0.4380211* (0.25925)	-0.1038409 (0.3676128)
Schooling				0.0557886 (0.1404149)	0.0341541 (0.1643378)	0.1074269 (0.1555461)
Urbanization				-0.0211736 (0.0150885)	-0.0175719 (0.0149262)	-0.0190705 (0.0159424)
Oil_income				-0.0848956** (0.0320291)	0.0789166** (0.029738)	-0.0415903 (0.0302067)
Religion_Catholic					0.0121087** (0.0047472)	0.0144658*** (0.0045531)

Table 3. OLS Estimation Results (Continued)

Dependent Variable: Democracy						
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>Ethnic_Fractionalization</i>					-0.1005343 (1.104807)	0.1703406 (1.058658)
<i>British_Colony</i>					0.8349481 (0.6477062)	0.5756378 (0.588863)
<i>Rule_of_Law</i>						0.9972825** (0.389133)
<i>Constant</i>	5.314672*** (0.7823227)	3.767938*** (0.712332)	3.157912* (1.628117)	-1.385261 (2.776709)	-1.813838 (3.450776)	2.046749 (3.695691)
Obs.	109	108	108	73	72	72
R²	0.1020	0.4399	0.4419	0.6599	0.6753	0.6967
F-statistic	11.77***	44.86***	34.02***	21.51***	14.65***	16.23***

Note: All models are estimated using OLS. Robust standard errors in parentheses, and $p^* < 0.10$, $p^{**} < 0.05$, $p^{***} < 0.01$. We have tested for multicollinearity using Variance Inflation Factor (VIF) in all models, and no multicollinearity was detected.

Thus, the results of our simple model indicate that CBI is conducive to democracy. But this relationship is dependent on the level of CB transparency prevailing in the country, where high levels of transparency could reverse this positive relation and make CBI a barrier to democracy. On the other hand, CB transparency is always associated with more democracy, but increasing the level of CBI reduces this positive impact for CB transparency. Also, it is worth mentioning that we have conducted diagnostic checks to test whether our model is well specified, have no omitted variables, and whether it suffers from multicollinearity and /or heteroscedasticity. Fortunately, our model passed all these diagnostic checks which strengthen the power of the results concluded from it.

5. Concluding Remarks

Despite the merits of central bank independence, in terms of favorable evolution of certain economic variables, without any loss in the real product, one criticism against it is the seemed contradiction between independence and democracy. From a political science and democratization perspective, however, liberal democracies require horizontal accountability. Elected authorities must be checked and balanced by independent state institutions to prevent transgressions and right violations. Interdisciplinary works, combining the work of economists and political scientists, have denied the existence of such contradiction in the actual organization of democratic societies. Enhancing de facto accountability, through

de facto transparency is often suggested to resolve this conflict. Accordingly, the objective of the present study was to empirically examine the potential effects of central bank transparency and independence (CBI) on democracy and thus attributes to reconciling the presumed contradiction between CBI and democracy.

The qualitative analysis investigating the association between CBI and democracy, together with transparency, across the sample under study varied among different groups of countries with different levels of transparency, institutional quality and income. Transparency appeared to be a potential channel of reconciliation. Enhancing the institutional quality was seen quite more effective in strengthening the positive relationship between democracy and CBI for less democratic countries with relatively low institutional quality. Furthermore, the positive association between CBI and democracy was clearer and relatively better established among developed countries. Accordingly, the question of whether enhanced central bank transparency delivers tangible benefits to the legitimacy and democratic stance of CBI remains to be an empirical one.

To this end, democracy was regressed on both CBI, as well as transparency, besides some control variables, to assess whether CBI and transparency significantly correlate to democracy. Moreover, an interaction term between CBI and CB transparency was added to test whether the relation between democracy and CBI depends on the level of CB transparency. CBI and transparency were measured using the indices constructed and used by Dincer and Eichengreen (2014) that cover more than 100 central banks during the period (1998 – 2010). Democracy was measured by an index constructed by taking the average of two indices, namely the Polity IV democracy index and the Freedom House democracy index.

The preliminary results indicated that CBI is conducive to democracy. However, this relationship was found dependent on the level of CB transparency, where high levels of transparency could reverse this positive relation. Furthermore, CB transparency is always associated with more democracy, but increasing the level of CBI reduces this positive impact. The empirical results were found quite consistent with those of the qualitative analysis.

To the best of our knowledge, there have been no

empirical studies that tackled the role of transparency as a factor that affects the relation between democracy and CBI. Thus, it is believed that this study contributed, with a preliminary value added, to the empirical literature on the political and institutional effects of CBI and transparency. However, this work could be further extended either in country coverage or over time. Also, using alternative measures for both CBI and transparency would foster the robustness of the reported results in the study. We leave these possible extensions to future work.

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