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Central Bank Independence and Accountability: A Literature Review

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Preliminary Draft

By Romina Bandura, Ronald Mendoza and Balkissa Sidikou-Sow

Office of Development Studies
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I. *Introduction and Context*

The tension between policy decisions taken by technocrats versus those responsive to the popular will is present in many areas of economic policy. This tension is particularly present in the discussion of institutional arrangements for central banks, specifically on central bank independence. The following note reviews the main issues discussed in the academic literature on central bank independence to illustrate and understand this tension in a narrower dimension, i.e. monetary policy.

In the academic literature, governments that are unable to make credible promises are regarded to be hindering economic development and effective policymaking. Political systems characterized by checks and balances and the delegation of authority to independent agencies (such as an independent central bank) have been promoted as an institutional solution to this problem (Keefer and Stasavage 2003). We have seen an increase in countries adopting this approach in recent years, with most of the industrial countries and many developing countries having highly independent central banks (Mishkin 2006; Maxfield, 1997, Arnone, Laurens and Segalotto 2006b, Pollillo and Guillén 2005, Wessels 2006)

However, many argue that this is not the best institutional arrangement as there is a fundamental conflict between central bank independence i.e. insulating policy from popular will, and democracy, i.e. making policy responsive to popular will (Drazen 2002). This dilemma becomes particularly important in a context of economic shocks or changes in public preferences.

The key to understanding the origins and consequences of today's monetary institutions lies in the interplay of political and economic forces and should be based on a careful analysis of the motives and strategies of both politicians and economic agents (Freeman 2002). Then, the main issue to explore in central bank design is the most appropriate institutional arrangement(s) that would combine or balance both effective monetary policy with democratic accountability.

II. *Definitions and Dimensions of Central Bank Independence*

Central Bank independence refers to the "freedom of monetary policymakers from direct political or governmental influence in the conduct of policy." (Walsh 2005) However, the relationship between government and the central bank is far from simple and thus different dimensions are used to characterize independence.

The relation includes (i) the legal rank of the central bank statute, prohibition of outside instructions and influence –*Institutional Independence*-; (ii) the role of the government in appointing and dismissing members of the central bank governing board, the voting power (if any) of the government on the board –*Personnel Independence*-; (ii) the degree to which the central bank is subject to budgetary control by the government, the extent to

which Government expenditure is either directly or indirectly financed via central bank credits –*Financial Independence*-; (iii) and flexibility given to the central bank in the formulation and execution of monetary policy. –*Policy or Functional Independence*-. (European Monetary Institute 1998, 1997a; European Commission 1998)

Many authors discuss central bank independence in two main dimensions[1]. The first dimension—*political autonomy*—is the ability of the central bank to select the final objectives of monetary policy. This first dimension is also known as "goal independence" (Debelle and Fischer 1995). This includes if the governor and board of directors are appointed without government involvement and for more than five years; there is no mandatory participation of government representatives in the board; no government approval is required in formulating monetary policy; there are requirements in the charter forcing the central bank to pursue monetary stability amongst its primary objectives; and there are legal protections that strengthen the central bank's position in the event of a conflict with the government (Arnone, Laurens and Segalotto 2006a; Grilli and others 1991)

The second dimension—*economic independence*—refers to ability of the central bank to select the monetary instruments necessary to the achievement of the goals. Hence the name "instrument independence" (Debelle and Fischer 1995). This includes limits on lending to government, own determination of monetary policy, control of own budget and salaries and possession of a range of monetary-policy instruments (Grilli and others 1991).

There are many indices that measure central bank independence. These include the ones elaborated by Cukierman, Webb, and Neyapti (1992), Cukierman (1992), Cukierman and Webb (1995), the GMT index (Grilli and others 1991), and the Alesina and Summers index (1993), among others[2].

Except from the Cukierman indices, in general indices look at the legal statutes governing a central bank's operations to evaluate the degree of political and economic independence also known as ***de jure independence*** (Fraser 1994; Johnson 2006). The general criteria for these indices are separated into political and economic, consisting primarily of *variations* on the following:

Political Criteria

- The primary policy objective of the central bank;
- The governing structure of the central bank (including the appointment, tenure and dismissal of the governor and the board;
- Locus of decision making;
- Accountability of the central bank.

[1] Developed by Grilli and others (1991).

[2] For surveys of indices measuring Central bank independence, please refer to Arnone, Laurens and Segalotto (2006a; 2006b).

Economic Criteria

- Financial independence;
- Financing government, and
- Instrument independence.

In these indices, a bank is viewed as more independent if the chief executive is appointed by the central bank board rather than by the prime minister or minister of finance, is not subject to dismissal, and has a long term of office. These aspects help insulate the central bank from political pressures. Also, independence is higher the greater the extent to which policy decisions are made independently of government involvement. A central bank is more independent if its charter states that price stability is the sole or primary goal of monetary policy. Lastly, independence is greater if there are limitations on the government's ability to borrow from the central bank (Walsh 2005).

However, legal measures of central bank independence may not reflect the relationship between the central bank and the government that actually exists in practice. In countries where the rule of law is less strongly embedded in the political culture, there can be wide gaps between the formal, legal institutional arrangements and their practical impact. This is particularly likely to be the case in many developing economies. Thus, for developing economies, it is common to supplement or even replace measures of central bank independence based on legal definitions with measures that reflect the degree to which legally established independence is honored in practice. Based on work by Cukierman, measures of actual central bank governor turnover, or turnover relative to the formally specified term length, are often used to measure independence, also know as ***de facto independence.*** High actual turnover is interpreted as indicating political interference in the conduct of monetary policy (Walsh 2005).

III. *Rationale for Central Bank Independence*

a. Background

Central Bank independence has been promoted as part of financial globalization, the monetary policy experience in counties and the evolution of thinking about monetary policy strategy (Maxfield 1997, Mishkin 2006).

One of the key theories that had an impact on monetary policy and central bank independence was rational expectations (in the 1970s)[3]. Rational expectations demonstrated that the public and the markets' expectations of policy actions have important effects on almost every sector of the economy (Mishkin 2006, p. 3). This idea was a big breakthrough in the understanding of monetary policy strategy and the recognition of the time inconsistency problem (Mishkin 2006, p. 11) — the latter being an important argument in favor of central bank independence (see section below).

[3] Mainly due to Robert E. Lucas, Jr. See Lucas (1972).

The combination of inflationary experiences of the 1970s and new theoretical breakthroughs have shaped current monetary policy. Mishkin (2006, p. 1) argues that there are six ideas that are now accepted by monetary authorities and governments in almost all countries of the world, which have led to improved monetary performance: 1) there is no long-run tradeoff between output (employment) and inflation; 2) expectations are critical to monetary policy outcomes; 3) inflation has high costs; 4) monetary policy is subject to the time-inconsistency problem; 5) central bank independence helps improve the efficacy of monetary policy; and 6) a strong nominal anchor is the key to producing good monetary policy outcomes.

b. Summary of key theoretical arguments in favor of central bank independence

Both political and economic variables are used to explain the rationale for independent central banks (Fraser 1994, Boylan 2001; Freeman 2002). The economics literature explains why the delegation of monetary policy to an independent central bank will yield, ceteris paribus, lower inflation rates (Gutierrez 2003, p. 4). These arguments include:

- *Public Choice Theory:* According to public choice theorists like Buchanan and Wagner (1977), central banks are exposed to strong political pressures to behave in accordance with the government's preferences and objectives. Since a contractionary monetary policy worsens its fiscal position, the government may prefer monetary expansion over contraction –"easy money", which results in high inflationary outcomes or inflationary bias. Thus, Government will exert political pressure on the central bank to relax the monetary stance as restrictive monetary policy worsens the fiscal position through a reduction in seigniorage revenue, an increase of the interest rate burden of debt and can also lower tax receipts due to a temporary slowdown effect on the economy caused by the restrictive monetary policy. Thus, independence allows the monetary authorities to resist political pressures from government (Gutierrez 2003, Maxfield 1997). The political business cycle model was also used to tie the behavior of policymakers to the electoral calendar. It is assumed that politicians will do their best to create growth and employment in the period leading up to elections, even if such behavior leads to future inflation (Nordhaus 1975, Alesina 1988). Alternatively, monetary policymaking may be put into the hands of authorities that are not subject to public elections, i.e. independent central banks.

- *Quasi fiscal deficits:* Independence reduces the temptation of government to incur budget deficits, funding these through borrowing from the central bank; i.e avoids the CB from printing money and thus endogeneizing money supply (Gutierrez 2003). Sargent and Wallace (1981) distinguish between fiscal and monetary authorities. According to them, if fiscal policy is dominant i.e. if the monetary authorities cannot influence the size of the government's budget deficit, money supply becomes endogenous. If the public is no longer able or willing to absorb additional government debt, it follows from the government budget constraint that monetary authorities will be forced to finance the deficit by creating money (and possibly lead to inflation). If, however, monetary policy is dominant, the fiscal

authorities will be forced to reduce the deficit (or repudiate part of the debt). Therefore, the more independent the central bank is, the less monetary authorities can be forced to finance deficits by creating money (Eijffiger and De Haan 1996).

- *The time-inconsistency problem*[4]*:* According to the authors of this theory governments have a preference for high employment and for minimal variations around a target inflation rate. However, once the inflation rate target is set, in order to win the favor of the electorate, the government has a strong incentive to inflate, thus increasing the employment rate by exploiting the short-run trade-off between unemployment and inflation predicted by the Phillips curve (Polillo and Guillen 2005 pp. 1769-1770). Thus, in this framework, monetary policymakers are tempted to pursue a discretionary monetary policy that is more expansionary than firms or people expect because such a policy would boost economic output (or lower unemployment) in the short-run. In other words, the monetary policymakers will find themselves unable to consistently follow an optimal plan over time; the optimal plan is *time inconsistent* and so will soon be abandoned (Mishkin 2006, p. 12). In the rational-expectations framework, social actors will expect the government's faltering commitment to low inflation and will incorporate a higher inflation rate in their decisions, thus neutralizing any effects on employment and producing a rate of inflation higher than it would be under a regime of credibility. A solution to this problem is to grant the central bank independence over monetary policy from any kind of political interference. The central bank expresses its commitment to low inflation and price stability by inscribing it in its statute. Rogoff (1985) suggests a further modification to central banking practices, advocating the appointment of a conservative central banker, who does not share the social objective function, but instead places a higher weight on price stability relative to output stabilization. Persson and Tabellini (1993), Svensson (1997), Mishkin (1999), and Bernanke and others 1999 suggest the use of an optimal contract between the central bank and the government, such as an inflation target.

Thus, making central banks independent can help insulate them from political pressures to exploit short-run tradeoffs between employment and inflation. Independence insulates the central bank from the myopia that is frequently a feature of the political process arising from politicians' concerns about getting elected in the near future and would thus lead to better policy outcomes. (Mishkin 2006, pp. 12-13)

Aside from economic arguments, there are other institutional or political rationales for central bank independence, including the following:

- *The need for technocrats:* Given the complicated nature of guiding macroeconomic policies, highly educated central banking professionals are best suited to make policy-guiding decisions (Johnson 2006). Delli Carpini and Keeter

[4] See Kydland and Prescott (1977); Barro and Gordon (1983); Rogoff (1985); Blinder (1998); Person and Tabellini (1993); and Romer and Romer (1996).

(1996) found for instance that only 18% of Americans comprehend the nature of monetary policy (Freeman 2002).

- *External credibility hypothesis:* In addition, in the case of transitional democracies, according to the external credibility hypothesis (Maxfield 1997; Johnson 2006), central bank independence was granted primarily in order to signal monetary policy credibility to international financial actors. This has for instance been the case in post-communist states (Johnson. 2006).

c. Empirical evidence

Given the theoretical arguments for central bank independence, does the empirical evidence prove the above point? Does the existence of an independent central bank improve economic outcomes in practice? Arnone, Laurens and Segalotto (2006a, pp. 6-8) show that many studies have demonstrated that, at least for industrial countries, central bank independence is a "free lunch". On average, countries with significant monetary autonomy have been able to achieve lower average inflation; cushion the impact of political cycles on economic cycles, enhance financial system stability, and boost fiscal discipline without any real additional costs or sacrifices in terms of output volatility or reduced economic growth.

CBI and Inflation

Many of the empirical studies confirmed that inflation and legal independence are negatively related in industrial economies (Alesina 1988, 1989; Alesina and Summers 1993, Bade and Parkin 1988; Grilli and others 1991, Cukierman 1992, Eijffinger, Van Rooij and Schaling 1996; Cukierman, Webb and Neyapti 1992). As mentioned earlier, the indices used to proxy independence based Central Bank law analysis. A review of the literature by Cukierman (1994) and Berger and others (2000) support the view that higher *de jure independence* is related to lower inflation in industrialized countries (Gutierrez 2003, p. 6).

For developing countries, various studies detected that neither inflation nor growth is related to legal independence. Cukierman (2006) explains this by the lack of link between actual and legal independence within this group of countries before the early 1990s. When behavior-oriented proxies of independence (such as the actual turnover of central bank governors and the index of political vulnerability) are used, a negative relation between inflation and independence emerges within the group of developing countries, as well (Cukierman, Webb, and Neyapti 1992)

In the case of developing countries, authors have utilized *de facto independence* indicators, such as rate of turnover of the central bank governor. The studies of Cukierman (1992); Cukierman, Webb, and Neyapti (1992); and Cukierman and Webb (1995) show that the average and variance of inflation rates in developing countries are negatively correlated to the de facto degree of CB autonomy. These studies suggest that there is a positive correlation between economic growth and de facto CB autonomy

indicators based on an analysis of the turnover rate of governors (Cukierman, 1992; Cukierman, Webb and Neyapti, 1992) or the degree to which their tenure is vulnerable to major political transitions (Cukierman and Webb, 1995).

Moreover, using data on the legal independence of freshly created central banks in former socialist economies in the 1990s, and controlling for cumulative liberalization, price decontrols and wars, Cukierman, Miller, and Neyapti (2002) find no relation between inflation and legal independence during the initial stages of liberalization. A negative relation between inflation and legal independence does emerge, however, once the process of privatization and liberalization of domestic prices and foreign trade becomes sufficiently large and sustained. A possible reason is that legal independence is enforced in practice only when the shift to a market economy has become sufficiently important to induce the authorities to seriously engage in law enforcement (Cukierman 2006).

In particular for the Latin American and Caribbean countries, Jacome and Vazquez (2005) find a negative relation between inflation and legal independence in the 1990s, when controlling for international inflation, banking crises, and the exchange rate regime. For a similar group of countries and time period, Gutierrez (2003) finds that countries that embed the legal independence of the central bank in the constitution have lower inflation than those that do not.

Arnone, Laurens and Segalotto (2006a) state that there has been little focus on the analysis of the costs of deflation tied to CB autonomy in developing countries. A paper by Wagner (1999, p. 16) on transition countries, argues that although legal independence of the central bank is a first step for building the institutional climate needed for actual independence, as long as it remains only legal i.e. only exists in paper, there is a danger that it will not only be ineffective but even counterproductive.

Many of the above studies have been criticized for not including appropriate controls or the sensitivity of the results to the sample period (Gutierrez 2003, p. 6). Moreover, the construction of these indices has also been criticized. For example, Mangano (1998) scrutinizes the indices elaborated by Grilli and others (1991) and Cukierman (1992) and finds that they "do not appear to offer a fully satisfactory representation of central bank's statutes" (p. 469). This includes the criteria contained, the weights and the way the criterion is combined.

More recent studies test the robustness of the statistical relationship between the distribution of inflation, growth and CB autonomy (Arnone, Laurens and Segalotto, 2006a). These studies have used different measures of autonomy, different time and cross-country samples, and additional determinants (such as political instability, trade openness, exchange regulations, per capita income, education levels, and proxies for the labor market structure) to explain geographic differences in inflation and growth levels. Although most of these studies suggest that the relationship between CB autonomy and inflation is clear and robust, there are several conflicting viewpoints[5].

[5] See Arnone, Laurens and Segalotto (2006a) for a summary of the studies.

CBI and Economic Growth

One the other hand, studies have also shown that central bank independence is not associated with a lower rate of economic growth in developed economies, which leads them to label central bank independence a "free lunch" (Grilli and others 1991; Alesina and Summers 1993). This corroborated by Cukierman, Kalaitzidakis, Summers, and Webb (1993), who find that although developing economies exhibit no association between legal independence and the growth rate of per capita income, the association between growth and actual independence (as proxied by the political vulnerability of the central bank and related measures of turnover) has a positive impact on the growth rate. More precisely, using data from the 1960s to the 1980s and controlling, for initial GDP, the change in the terms of trade, and initial primary and secondary enrollment ratios, the paper finds that high political vulnerability of the central bank governor and related measures of turnover are negatively associated with per capita growth.

CBI and Investment

For a subset of developing countries, Cukierman, Kalaitzidakis, Summers, and Webb (1993) also find, in some cases, a similar negative impact of turnover on the share of investment in GDP. A possible interpretation of the last two results is that private investment is lower under weak central bankers, reducing the long-run growth rate.

In particular for developing countries, Maxfield (1997) found that "the greater the central bank independence, the higher the private investment" (p.146). Pastor and Maxfield (1999) examine the impact of central bank independence on the level of private investment in 20 developing countries. Using the Cukierman index (1992) they conclude central bank independence can raise private investment through signaling commitment to reform, particularly in democratic political systems in which CBI may be a way to assure investors that monetary policy will be shielded from populist pressures.

IV. *Reconciling central bank independence with democratic institutions*

Despite the empirical evidence and the arguments displayed favoring central bank independence, critics[6] contend that independence is antithetical to democracy and should be limited (Levy 1995). These authors base their arguments on:

- *The concentration of immense power of unelected individuals:* Presidents and committees are appointed by Board of Directors largely elected by bankers, not citizens, and the criteria used for selection are very limited (e.g: The Monetary Policy Committee of the Bank of England where the majority power is elected by and given to members of private corporations). As stated by Stiglitz (1998), "typically, those who make the decisions are not representative of society as a whole". In Britain, for instance, academics and parliamentarians alike have

[6] See also McCallum (1995).

argued that central bank independence violates the funding principle of parliamentary sovereignty (Johnson 2006).

- *Monetary policy not being more complicated than other economic areas:* Beliefs that monetary policy is no more complicated, technical or arcane than any other issue areas, such as taxation, health care or foreign policy, and has no special qualities requiring its insulation from democratic control and debate. Central bank decisions are inherently political because they have major distributional effects. In other words, the implications of monetary policy go beyond price stability or inflation targeting (i.e. impact on employment, wages and economic output and the distribution of economic resources) and therefore do involve social trade-offs (Levy 1995). Monetary policy equally plays a key role in foreign policy by manipulating exchange rates and wields strong control over foreign economies whose monetary systems use or are pegged to its currency (Johnson 2006). Consequently, the choice of monetary regime must be based on broader welfare considerations.
- *Objectivity of the central bank:* A central bank that does not have a systematic, objective method of selecting the right policy to meet its goals of a stable currency and healthy financial sector;
- *Monetary policy not being more important than other economic policies:* In post-communist states, independent central banks send far less important signals to international markets than do budget, tax and privatization policies. In the Russian context, the Central Bank of Russia's political dependence does not necessarily have the downsides that proponents of independence might expect, and it has added benefit of improving policy coordination among the Central Bank, the Finance Ministry and the government. Indeed, it has been argued that in transitional economies, there might be a need for a more moderate level of inflation in order to achieve rapid adjustment and growth. In the long run, however, this can be a significant problem (Johnson 2006).

In an attempt to reconcile delegation with democratic principles, Johnson (2006) argues that central bank independence is a feature of democratic politics, designed through government legislation to mitigate a certain deficiency of democratic systems, and should be subject to extensive democratic inclusion and oversight (Johnson 2006). As stated by Alan Greenspan in 1996: "A Central Bank in a democratic society is a magnet for many of the tensions that a society confronts". In an optimum regime, which according to the economist Jan Tinbergen is a bundle of institutions designed to maximize social welfare, independent institutions must be combined with democratic institutions such as legislatures and elections (Freeman. 2002). Indeed, and using the argument of checks and balances, Keefer and Stasavage (2003) suggest that "political institutions…are crucial to the sustainability and effectiveness of decision making by independent agencies". Without these, "policy reformers face frustration…if they grant policy making authority to formally independent agencies".

Drazen (2002), on his side, argues that central bank independence is not inconsistent with democratic control of policy making once one understands the role of "constitutionalism", central to the functioning of democracy and by which some

decisions are removed from "day-to-day political pressures and are made difficult to reverse, i.e. have "stringent amendment procedures" introduced to "protect the electorate against itself". "Expert democracy" is also seen as a way to reconcile central bank independence with a commitment to democratic values and popular sovereignty. However, a study of the inflationary preferences in the Organization for Economic Cooperation and Development countries conducted by Scheve (2002) found that, within and across countries, there is considerable difference in the importance that citizens attach to inflation relative to other outcomes like employment. Moreover these preferences vary over time depending on the context. In addition, Hibbing and Theiss-Morse (2002), present data where two-thirds of the American electorate are uncomfortable with deference to non-elected experts. Consequently, the consensus with respect to the goals of monetary institutions seems to be a false perception (Freeman 2002).

As a result, recent discussions on central bank independence evolve around the following two issues: i) The short-term versus long term trade-off on inflation/output and the 'natural rate" of unemployment, and whether such a trade-off is worth-while (Levi. 1995; Johnson 2006) as well as ii) the appropriate degree of separation of the central bank from government (Fraser 1994; Drazen 2002) and of transparency and accountability of the central bank. In addition, Keefer and Stasavage (2003) argue that delegation to independent central bankers under certain political conditions improves the credibility of government policy commitments.

V. *Accountability, Legitimacy and Credibility*

In the presence of independent central banks, issues of accountability and transparency become more important than in the past. Basic democratic principles require that the central bank is accountable for its actions, meaning that the public understands what it is doing (Mishkin 2004). As a central bank becomes more independent, it needs to be more accountable for achieving the goals specified in its charter (Fraser 1994).

In addition, preferences of policy-makers are aligned with those of the society at large. According to Freeman (2002), central bank independence is only "democratic as long as the public's "perceived consensus" about economic policies and macroeconomic outcomes is real". The relevance of "perceived consensus" is illustrated by Bernd (1998) which found that in nine European countries inflation levels were more closely related to public opinion about inflation than the relative independence of central banks. Another indicator is the Bank of England Inflation Attitudes Survey (Freeman 2002). The central bank should also be legitimate and credible as it can operate effectively over the long run only if key domestic actors want them to do so and only if some agreement exits on the value of their basic inflation-fighting principles (Johnson 2006).

Central bank independence must be democratically legitimated through the building and maintaining of broad domestic support from government, the legislative, the financial sector and the public. In Germany and the United States, central bank independence emerged after domestic debates and political consensus building. (Johnson 2006). On the

other hand, many post-communist states face an uphill battle to prove their worth by attempting to retroactively build domestic constituencies. In these countries, central banks where granted independence, charged with fighting inflation and given the modern tools with which to do it, but they have become scapegoats for currencies crisis and recessions in an economic environment that often thwarted their best efforts given the poor transmission mechanisms for monetary policies, insufficient monetary sovereignty, incompatible fiscal policies and economic uncertainty (Johnson 2006). This has led to the delegitimization of the post-communist central bank independence. In Hungary and the Czech Republic, for instance, the central bank boards have been reshuffled and the legislation has been revised undermining their independence. In Russia, the central bank has lost its autonomy with the "managed democracy" under President Vladimir Putin, both de jure (in law) and de facto (in practice). Drazen (2002), on the other hand, believes that in emerging democracies (characterized by a need to strengthen democratic principles or the democratic processes itself) insulating aspects of policymaking from popular pressures should cement rather than undermine the democratic processes in these countries.

The analysis of the independence, accountability, legitimacy and credibility of a central bank should include an examination of the institutional framework governing the bank as well as elements of transparency and communication.

Walsh (2003) argues that the fundamental trade-off between accountability and stabilization depends on the degree of transparency, defined as the ability to monitor central bank independence. The optimal targeting weight balances the need for accountability (high powered incentive schemes) with the imperfect ability to monitor the central bank (low powered incentive scheme). Multiplicative uncertainty increases the optimal weight to place on achieving an inflation target. A structure that induces the central bank to truthfully reveal its information, i.e. a transparent structure, can therefore support stricter targeting regimes. Eijffinger, Hoerberischts and Schaling (1998) argue that accountability through transparency, defined as little uncertainty about central bank preferences, leads to a lower expected rate of inflation and less stabilization of supply shocks while accountability through shifting final responsibility in the direction of the government leads to higher inflationary expectations and more stabilization of supply shocks. According to Stasavage (2001), central bank transparency reduces the costs of disinflation, especially if Governments are Left or Center in their partisanship, as private agents can make quicker and less costly adjustments to disinflationary policies. This is related to the way *expectational* mechanisms operate. Freeman (2002) also refers to the work of Barro and Gordon (1983) alluding to the possibility that over time private agents learn about the preferences of policy makers. This produces extended or sporadic punishment of policymakers for cheating that, in turn, produces multiple, *reputational* equilibria.

To increase transparency, the central bank can enhance communication at four levels:

- Government for policy coordination and influencing of each others' activities;

- Elected legislature (In the US, the Chairman of the Federal Reserve is obliged to testify before the Congress several times a year. In Australia, the Reserve Bank testifies before the Parliament);
- Financial sector;
- Public, for instance through regular public speeches, quarterly articles and annual reports (Ex: the Reserve Bank of Australia).

Since the beginning of the 1990s, we have seen a revolution in the way central banks communicate with the markets and the public, recognized as being key to a successful monetary policy (Mishkin 2004; Johnson 2006). Despite this intensification, the transparency of central banks is far from complete. Elements of communication that inflation-targeting central banks can promote to increase transparency of central bans include:

- Minutes from Board Meetings;
- Inflation reports (Quarterly Inflation Report published by the Bank of England);
- Policy rate projections (Few, such as New Zealand and Colombia);
- Inflation forecasts (Most countries with the exception of Turkey and Israel);
- Output growth forecast (mixed);
- Output gap forecasts (rare);
- Objective function;
- Output fluctuations.

These channels of communication will further enhance political oversight, increased incentives for the central bank to produce good forecasts (poor forecasts would be embarrassing) and enhanced credibility of and support to the central bank and anchor of inflation expectations (Levin, Natalucci and Piger, 2004) generating better performance on both. This is done through evaluation of quality and assessment of seriousness of the central bank. However, Mishkin (2004) argues that central bank transparency must always be thought of as a means to an end. Central banks should therefore not publish the path of the policy interest rate and its objective function, but should honestly discuss that they do care about reducing output fluctuations.

According to Cukierman (2006), while there is not yet a consensus on the optimal degree of transparency or the precise procedures for implementing transparency, two issues remain open: 1) How to ensure transparency when monetary policy decisions are made by a council composed of individuals with different loss functions and expectations; and 2) A more normative issue: Assuming that the mapping between transparency and institutional devices is known with certainty, should the level of transparency be as high and as immediate as technically feasible?

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