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# IMF Working Paper

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## Central Bank Financial Strength, Policy Constraints and Inflation

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## IMF Working Paper

Monetary and Capital Markets Department

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#### Abstract

**This Working Paper should not be reported as representing the views of the IMF.**

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Central bank financial strength is positively associated with good policy performance. Financially weak central banks generate losses which undermine macroeconomic stability and call into question the credibility of their policies. In assessing central bank financial strength a careful examination of the policy regime and the volatility of the economic environment is necessary. Conventional measures of private enterprise financial strength—profitability and capital—can be very misleading when applied to central banks. The way in which a central bank balance sheet is strengthened matters. Providing the central bank with marketable government debt that can be used to develop a money market that in turn may become the locus of central bank monetary operations serves both to directly strengthen the institution and improve the quality of the environment in which it operates, thereby facilitating the attainment of its ultimate performance objectives.

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**ACRONYMS**

BCCR	Central Bank of Costa Rica (Banco Central de Costa Rica)
BOJ	Bank of Jamaica
CNB	Czech National Bank
EMU	European Monetary Union
IFS	International Financial Statistics
NBH	National Bank of Hungary (Magyar Nemzeti Bank)
OIN	Other Items Net
RBI	Reserve Bank of India
SARB	South African Reserve Bank

## I. INTRODUCTION

This paper argues that the financial strength of a central bank is an important factor determining policy outcomes. Although small changes in central bank finances are not material to macroeconomic policy performance in well-capitalized central banks, it can be demonstrated that poorly-capitalized central banks are often constrained in their policy choices or, even when not so constrained, sometimes loosen policy to avoid large losses for reputational or political economy reasons. Roughly speaking, the importance of central bank financial strength for policy outcomes increases exponentially as central bank finances become weaker or policy commitments become more ambitious. More generally, the financial strength of an independent and credible central bank must be commensurate with its policy tasks and the risks it faces.

The paper is organized as follows. In Section II, the concepts of central bank financial strength and policy performance are discussed and contrasted with the analogous concepts for private commercial enterprises. An important distinction is drawn between microeconomic efficiency—which is important in all enterprises at all times—and financial strength which is essentially a measure of how likely it is that a central bank will be financially unconstrained when choosing the setting of its policy instruments. Financial strength is thus a function not only of the accounting valuation of the central bank's balance sheet but also the nature of the policy regime, the predicted volatility of the economic environment, and the degree of desired financial independence granted the central bank by the political system.

Section III provides the reader with an overview of central bank financial strength in a variety of countries. It is clear that different countries have different views and points of emphasis on the issue. Central bank microeconomic efficiency is a universal concern but losses become a macroeconomic concern only when their nature and extent limit operational capacity and/or damage credibility.

Section IV discusses why cross-country comparisons of central banks are difficult—idiosyncratic and opaque accounting practices. Notwithstanding these problems, evidence that central bank accounting is becoming more transparent over time is presented. Given these caveats, the section provides quantitative evidence that policy performance, as measured by the rate of inflation, is significantly worse in countries with financially weak central banks.

Section V considers the variety of ways in which central banks have been recapitalized or strengthened in practice. It argues that the method and/or instruments used can have a critical bearing on whether an improvement in policy performance is subsequently attained. Section VI contains concluding remarks.

## II. CONCEPTS OF CENTRAL BANK FINANCIAL STRENGTH AND POLICY PERFORMANCE

The term “financial strength” is used in this paper to describe the extent to which an entity is constrained by its financial situation in pursuing its strategic goals or policies. An entity is financially strong when it is relatively unconstrained and weak when financial constraints are binding on policy choices.

The financial strength of commercial banks, or more generally private enterprises, is intimately linked to the successful management of the enterprise. The primary metric of private enterprise performance is profitability. A second metric, enterprise book value, or capital, is a direct reflection of accumulated past earnings. Another metric, market capitalization, is a straightforward function of the present discounted value of expected future earnings adjusted by the expected volatility of earnings as well as the correlation of those earnings with the overall market. Hence, enterprises with a large market capitalization have either been successful at generating earnings in the past and/or are expected to be profitable in the future.

In a competitive market environment, profitability or market capitalization should be correlated with economic efficiency. Thus, these measures of financial strength would reflect efficient production of whatever good or service is produced by the enterprise. In less competitive markets, profitability is less likely to be correlated with economic efficiency and indeed, basic microeconomics demonstrates that a profit maximizing monopolist will produce an output at a lower than socially optimal level and charge a higher than socially efficient price. More generally, short-term profitability may not be reflective of economic efficiency. Random factors which management may not reasonably have been expected to hedge against can impact profitability even if management performance is exemplary and economic efficiency maintained. That said, enterprise financial strength and profitability over an extended period can be said to be accurate summary metrics of the relative efficiency and effectiveness of enterprise performance.

Neither profitability nor market capitalization are primary considerations for a central bank. Created by specific legal statutes, central bank performance is assessed fundamentally on how well the institution meets the objectives explicitly stated therein. Thus the primary benchmark is effective guidance of macroeconomic conditions—how well the central bank creates conditions in the rest of the economy conducive to economic growth, price stability, and financial stability. A secondary consideration is how efficiently the central bank achieves these “outputs”, that is the internal efficiency with which it minimizes the cost of attaining its objectives.

Central bank performance reporting is the obverse of that of a private enterprise where profit maximization/cost minimization comes as a primary goal and overall socio-economic efficiency is secondary. This difference in relative emphasis is easy to discern by reviewing any central bank and private enterprise annual report side-by-side. Central bank financial performance is almost invariably discussed only at the end of the annual report (if at all), preceded by many pages discussing overall economic performance and the central bank’s particular policy stance and operations during the year. In a private enterprise, the ordering of the financial results and the actual operations of the enterprise—its “social contribution”—is

reversed. This is not to say that both elements are not important to both types of entities, but it must be stressed that revenue generation is essential to profit maximizing institutions while it is largely incidental to the activities of a central bank. It is quite easy to imagine successful, even brilliant, central bank policy measures being taken that have a negative impact on the profit and loss statement; the same could rarely be claimed in a private enterprise.

One can usefully separate micro and macro performance measures for a central bank. Our main concern in this paper is on the macro performance and, in particular, those situations where the financial strength of the central bank is not sufficient for it to obtain its primary objective(s). We will have less to say on the micro efficiency of central banks although, as a public enterprise, it is responsible for a proper stewardship of the resources it is granted. But in measuring both types of performance, profitability is not as useful a “bottom line” as it is for private enterprises. Furthermore, what appears to be confusion over micro and macro performance is responsible for a certain lack of general understanding about the importance of central bank financial strength.

Central bank financial accounts do provide useful information on the cost of achieving policy outcomes. Indeed they provide information vital to any discussion as to whether the outputs are being attained at least cost. However it is difficult to define what is the cost minimizing combination of central bank inputs (we already know it is *not* the profit maximizing mix). The problem with analyzing central banks from this perspective is that there is not a well defined production function. That is, price stability, low output volatility, a sustainable exchange rate, and financial market stability—how are these achieved at lowest cost? The answer to this question is not well defined and indeed one could ask whether it is well posed given our ignorance as to how to measure the value of attaining these goals. One is also confronted with the reality that the central bank is only one among several policymaking institutions which have a bearing on the outcome. Hence subsidiary measures of central bank efficiency (beyond evaluating the overall rate of return on capital) are required for transparent financial accounting and financial management.

This view is reflected in the Bank of Canada 2005 Annual Report, “Net revenue is not a good indicator of the bank’s management performance. The bank deals in financial markets to achieve policy goals, not to maximize its revenues. For this reason the level of operating expenses is a better indicator of the bank’s stewardship of public resources.”

In exploring precisely whether financial performance and financial strength of the central bank impacts policy performance it must be noted that in a number of countries the central bank is financially so strong that it is very difficult to imagine it becoming an obstacle to policy and the focus of the public discussion in those countries is squarely on the micro elements of central bank performance. When the issue of financial strength does arise in those countries, it is difficult to argue that a marginal deterioration in central bank financial strength would be inimical to macroeconomic performance—and indeed in those countries that is correct. For that reason, when central bank losses do occasionally arise there, the debate naturally tends to center not on policy constraints but on the rather remote notion of financial insolvency; that is, the question is not posed “will the policy regime need to be adjusted or abandoned?” but “would the institution become financially insolvent?” The latter



prospect being implausible the former question is dismissed out of hand, or (rightly) it is argued that profitability should not be a primary concern of the central bank.

Owing to this experience, and conditioned to think first that central bank profitability is immaterial to financial solvency—and second, that it should not influence whatsoever policymaking, some fail to recognize that in other countries losses play a key role both in limiting policy outcomes and in influencing policy decisions.

In countries with strong central banks, the conventional wisdom is that potential financial insolvency is not a problem—first because the central bank can create an unlimited amount of domestic currency, or second that it would be bailed out by government. But this is not correct in a number of countries where this problem has actually arisen. In the first case, it should be obvious that although the central bank can create an unlimited nominal value of domestic banknotes (or electronic deposits) at some point these will cease to be money, i.e., accepted as a means of payment.<sup>2</sup> Second, governments have not historically come to the financial aid of central banks on a timely basis, most frequently because times of central bank distress are associated with fiscal distress and indeed the root cause of central bank problems is often quasi-fiscal activities imposed by treasuries<sup>3</sup>. Third, although central banks virtually never become legally insolvent<sup>4</sup> at times of financial distress, policy outcomes do deteriorate, which is precisely the important macroeconomic issue.<sup>5</sup> In those cases, central bank financial strength is relevant.

If credibility is important for the success of monetary policy, the central bank must be financially strong.<sup>6</sup> The practical implication of this premise is that financially strong central banks should ensure that their strength remains adequate to cope with their policy responsibilities and attendant risks. Their economic auditors should in turn utilize risk-based models to ascertain whether in most circumstances the central bank can survive adverse events without the need to abandon its objectives.<sup>7</sup> Clearly, when the objective, policy

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<sup>2</sup> This is not merely a theoretical proposition. The Central Bank of Liberia (CBL) was at one time expelled from the Monrovia check clearing house for failure to settle its obligations. Commercial banks refused to accept CBL balances as “money” owing to the CBL’s inability to redeem its liabilities in domestic currency banknotes or foreign exchange. Dollarization is another form of the rejection of local currency.

<sup>3</sup> See Fry (1993) and Mackenzie and Stella (1996).

<sup>4</sup> The only exception of which the author is aware is the central bank of the Philippines.

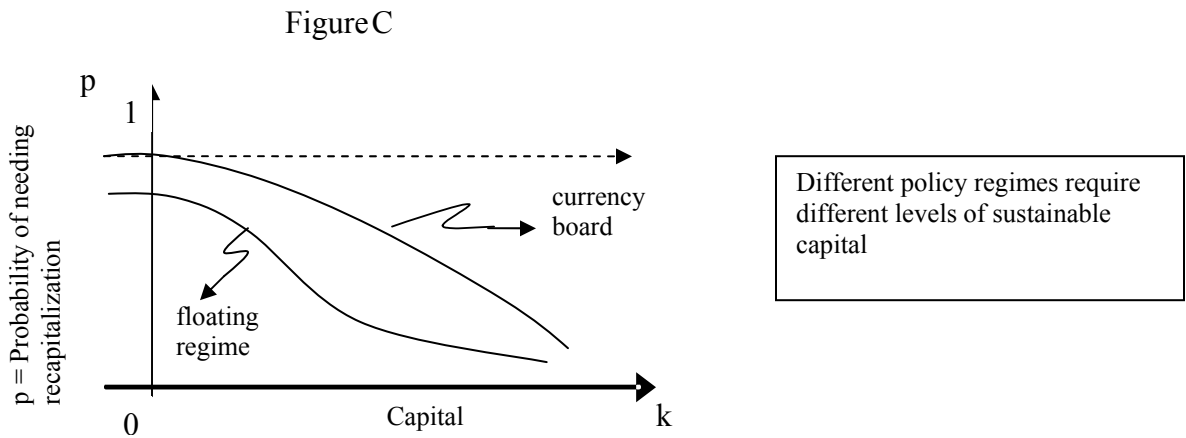
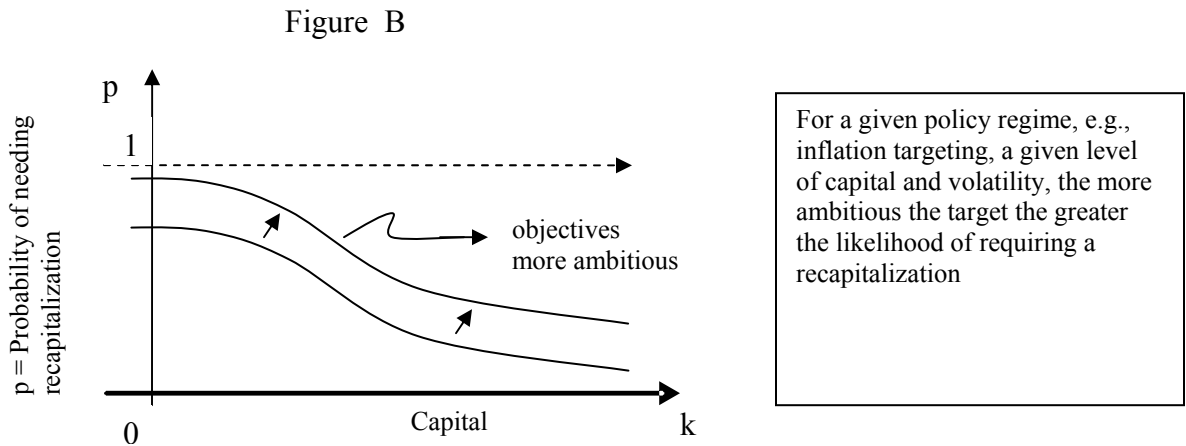
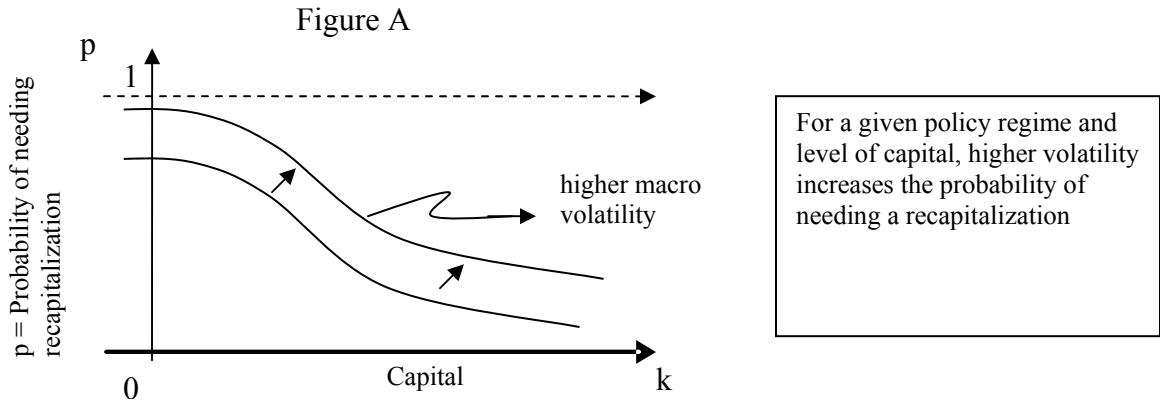
<sup>5</sup> This idea that central bank performance is not properly measured by a static balance sheet concept of “net worth” but by the capacity to meet policy objectives has some similarity to Fry, Goodhart, and Almeida (1996, page 39) where central bank insolvency is defined as “negative net worth at all steady state rates of inflation”. Thus by their definition, a central bank with negative net worth could be considered “solvent” as long as it were able to stabilize the rate of inflation.

<sup>6</sup> See Johnson and Zelmer Bank of Canada Discussion Paper (2007), for a discussion of why avoiding negative capital is desirable to underpin public confidence in the conduct of monetary policy and the central bank’s ability to backstop the financial system in a crisis. <http://www.bankofcanada.ca/en/res/dp/2007/dp07-2.html>

<sup>7</sup> For an application of this, see Blejer and Schumacher (1998).

regime, or level of environmental volatility changes, the appropriate degree of central bank financial strength should be reevaluated. This can be illustrated conceptually in graphs (see Figure 1).

Figure 1. The Impact of the Policy Regime, its Strength and Environmental Volatility on the Probability of Requiring a Recapitalization



The following section illustrates various country cases when central banks exhibit varying degrees of financial strength. It is clear that in those countries with financially strong central banks the focus of public debate is on micro considerations while where central banks are weak the impact is clearly seen on macroeconomic performance.

### III. OVERVIEW OF CENTRAL BANK FINANCIAL STRENGTH IN A VARIETY OF COUNTRIES

In countries with traditionally strong central bank balance sheets, the issue of financial strength rarely draws attention. Such cases are exemplified by the United States, Canada, and the member states of the European System of Central Banks.

In the United States, 90 percent of the Federal Reserve System's assets consist of U.S. Treasury securities and federal agency obligations. The remainder is largely gold (valued at a constant accounting rate) and foreign assets.<sup>8</sup> On the liability side, Federal Reserve Notes outstanding amount to 91 percent of total liabilities (excluding capital and surplus). Reserves of depository institutions—which are non-interest bearing—account for a further 3 percent, implying that Federal Reserve liabilities generate virtually no cost. Profits during 2002–2006 averaged US\$25.6 billion (selected years are shown in Table 1, below).

**Table 1. United States: Consolidated Federal Reserve System  
Selected Balance Sheet and Profit and Loss Accounts**

(In billions of U.S. dollars)

	Capital	Profit	Transfer to Treasury	Total Assets
1981	2.6	14.2	14.0	176.8
1986	3.7	18.0	17.8	267.4
1991	5.3	21.2	20.8	353.1
1996	9.1	21.0	20.1	481.5
2001	14.7	28.0	27.1	654.9
2004	23.5	21.4	18.1	810.9
2006	30.6	34.2	29.1	873.4

Source: Board of Governors of the Federal Reserve System, *Annual Report*, various issues.

Given the size of its virtually guaranteed profit, it is not surprising that the U.S. General Accounting Office has found no compelling reason for the Fed to hold capital.<sup>9</sup> Even were the central bank's financial situation to deteriorate, U.S. policymakers appear confident that they would be able to simply create money to meet central bank obligations:

<sup>8</sup> The Federal Reserve shows only part of the stock of U.S. international reserves on its balance sheet. Part is held on account of the Treasury Exchange Stabilization Fund.

<sup>9</sup> United States General Accounting Office (2002).

“Indeed, in the abstract, a central bank with the nation's currency franchise does not need to hold capital. In the private sector, a firm's capital helps to protect creditors from credit losses. Creditors of central banks, however, are at no risk of a loss because the central bank can always create additional currency to meet any obligation denominated in that currency.”<sup>10</sup>

The situation with the Bank of Canada is similar. The authorized capital of the Bank of Canada is Can\$5 million. The general reserve (“rest fund”) of the bank was accumulated out of the bank’s net revenue until it reached the stipulated maximum of Can\$25 million in 1955. Out of total assets of Can\$48 billion, the Bank holds Can\$43 billion (92 percent) in securities issued or guaranteed by Canada a AAA-rate sovereign, and its liabilities are largely non-interest bearing currency.<sup>11</sup> Under these circumstances, the Bank is virtually assured a profit under steady state conditions although fluctuations in asset values could lead to volatility in equity. The Bank of Canada Act was amended in 2006 following the introduction of new fair-value accounting rules in Canada to allow the Bank’s Board of Directors to retain as much as CAN\$400 million to offset unrealized valuation losses on the investment portfolio. An initial retention of CAN\$100 million was approved by the Bank’s Board in September 2007.<sup>12</sup>

**Table 2. Bank of Canada**  
(In millions of Can\$)

	Capital 1/	Profit	Total Assets
1955	5	1	308
1965	30	156	3,956
1975	30	629	10,496
1985	30	1,880	21,135
1995	30	1,816	30,201
2005	30	1,732	48,320
2006	30	1,896	51,626

Source: Bank of Canada

1/ Includes Can\$5 million in share capital and Can\$25 million in the “Statutory Reserve.”

The ECB was established with a capital of €5 billion. In addition, foreign exchange assets of €39.5 billion were transferred to the ECB by countries participating in Stage Three of the European Monetary Union (EMU) in early 1999. The motivation for the capital was to fund startup costs of the bank, as well as to generate continuing operating income. This was deemed particularly important as seigniorage from note issue was to begin only in 2002. Furthermore, the ECB has a large foreign exchange exposure, since 90 percent of its assets

<sup>10</sup> Testimony of Governor Laurence H. Meyer before the Committee on Banking and Financial Services, United States House of Representatives, May 3, 2000.

<sup>11</sup> See Bank of Canada (2005). Canada’s foreign reserves are held in the Exchange Fund Account. Although managed by the Bank of Canada, they are not on the balance sheet.

<sup>12</sup> Johnson and Zelmer (2007), provides further details on the rationale for this approach.

are in foreign exchange and gold, which has an offsetting counterpart in euros—liabilities to national governments owing to the transfer of foreign exchange.

Owing to its large open foreign exchange position (and partly reflective of its conservative accounting policy) the ECB is exposed to losses. The losses, however, as can be seen in Table 3, have not been of macroeconomic significance and have not been part of the ECB monetary policy debate.

**Table 3. European Central Bank**  
Profits/Losses (-)

	In Billions of Euro	In Percent of 2003 Euro Area GDP
1999	0.67	.00
2000	1.99	.03
2001	1.82	.02
2002	1.22	.02
2003	-0.48	-.00
2004	-1.64	-.02
2005	0.00	.00
2006	0.00	.00

Source: ECB Annual Reports, various issues. In 2005 and 2006, provisions amounting to 0.99 billion Euro and 1.38 billion Euro, respectively, were established, which had the effect of reducing net profit to exactly zero, (page 198).

Therefore, central bank expenditures in the United States, Canada, and the ECB are essentially something to be concerned about in a microeconomic efficiency sense but not having a material impact on policy formulation. Bundesbank President Axel Weber on the occasion of the release of the 2004 Bundesbank profit figure, expressed the consensus view concisely:

“The Bundesbank profit is a residual issue for me and my colleagues...I don't enter into any strategic considerations about Bundesbank profits, neither in the morning, afternoon or evening.”<sup>13</sup> And some months later outlined the issue quite precisely:

“Maximizing profit is not a goal of the Bundesbank,” Weber told the agency [Reuters]. “We are instead striving to carry out our many tasks with the most efficient use of resources possible.”<sup>14</sup>

It is interesting for a moment to contrast the statements of Meyer on the one hand and Weber on the other. While the latter clearly states that financial concerns should not impact policy, Meyer's remarks, that central bank financial solvency should not be a concern as additional banknotes could always be created, carries with it the presumption that losses might require a

<sup>13</sup> Reuters (2005a).

<sup>14</sup> Reuters (2005b).

change in policy. Indeed, as discussed below, many central banks have found themselves in situations where their policy options were restricted by the need to create money in excess of what would have been called for by prudent monetary policy. Others have resorted to financial repression to reduce losses. Provided the losses do not exceed the sustainable level of seigniorage and provided of course that the central bank need not maintain price or exchange rate stability, such losses, and a deterioration of the central bank's balance sheet, can go on indefinitely.

Many central banks have indeed changed policy in the face of heavy losses. In 1997, the Central Bank of Venezuela aggressively issued its own obligations to sterilize capital inflows, but this impact was negated by a drawdown of treasury deposits at the central bank owing to a loosening of the fiscal position. Following further sales of its own debt and an increase of reserve requirements by a total of 5 percentage points, monetary policy was eventually eased markedly in the last few months of the year owing to growing concerns about the quasi-fiscal losses arising from sterilization.<sup>15</sup>

The central bank of Costa Rica has made losses for close to two decades consecutively. In Costa Rica, the persistence of central bank losses has impeded the central bank's ability to achieve low inflation. By the end of 2000, the bank had negative capital exceeding 6 percent of GDP.<sup>16</sup> The central bank balance sheet has structural problems as evidenced by the fact that by the end of 2002, interest-bearing liabilities were almost double interest-bearing assets. While the authorities have taken important steps forward in their plan to recapitalize the central bank, Ize (2005) has pointed out that it is unlikely the rate of inflation can be brought below double digits on a sustained basis without a significant further strengthening of the balance sheet.<sup>17</sup> Indeed, the central bank has been unwilling to lower its target rate of inflation in recent years out of concern for the sustainability of its balance sheet. Thus policymakers' concerns are dramatically different from those expressed by Weber. The central bank governor, in an interview with *Central Banking*, stated:

“We, the central bank, have a negative net worth...and this remains our greatest challenge.”<sup>18</sup>

Jamaica is another country where central bank losses have impacted on macroeconomic policy. In the early 1990s the situation at the Bank of Jamaica (BOJ) was dire. At the end of 1991, it was estimated that the BOJ had negative net equity of US\$1½ billion. The losses had their origin in quasi fiscal activities including exchange rate guarantees and other subsidy schemes and the servicing of external debt on behalf of government and other public sector entities. The BOJ also had interest expenses on the CDs it issued to absorb the liquidity created by the financing of these operations and from revaluation losses on its negative net

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<sup>15</sup> IMF (1998).

<sup>16</sup> *Memoria Anual 2000*, Central Bank of Costa Rica.

<sup>17</sup> See Central Bank of Costa Rica (2003), IMF (2004a), and Ize (2005).

<sup>18</sup> Francisco de Paula Gutiérrez, President of the Central Bank of Costa Rica (*Central Banking*, Vol. XV No.4, May 2005, page 82).

foreign assets in the context of high inflation and a depreciating exchange rate. With the issuance of CDs largely serving to sterilize the payment of interest on the existing stock of CDs, the BOJ increasingly relied on an unremunerated required reserve and a liquid asset requirement imposed on commercial banks. The BOJ's policy options were limited as losses averaged 53 percent of reserve money during fiscal years 1988/89–1991/92. The rate of consumer price inflation exceeded 80 percent at the end of 1991.

Although the BOJ was eventually recapitalized, losses—derived from the costs of foreign reserve accumulation are once again becoming a source of controversy. Recently Bank of Jamaica governor Derick Latibeaudiere “...dismissed concerns raised by the IMF about the level of loss being racked up by the central bank, arguing at a press conference that the benefits of the deficit to Jamaica outweighed the costs.”<sup>19</sup> The governor essentially argued that the “insurance” value of foreign reserves outweighed the cost of absorbing liquidity created by foreign exchange purchases.

Other cases where central bank losses have been of macroeconomic significance include Uruguay, where central bank losses averaged 3 percent of GDP in the late 1980s. In Nicaragua, the cost of resolving four banks that failed during the year August 2000–2001 led the Central Bank of Nicaragua to issue dollar-indexed bonds totaling 20 percent of GDP.

Up to this point we have considered two opposite ends of the spectrum, cases where marginal changes in central bank financial strength are immaterial and others where they have overwhelmed sensible policy choice. In other cases the situation is less clear, specifically where losses or balance sheet weakness calls into question the authorities' willingness to sustain a particular policy stance—usually costly foreign exchange intervention.

A somewhat unusual case, where the sustainability of an *expansionary* policy stance has been called into question, is that of the Bank of Japan. In late 2002 and early 2003 market analysts began to question whether the Bank would continue its policy of expansive purchases of long-term government debt in light of the attendant risk of capital losses.<sup>20</sup> Alarmist headlines such as “Is the Bank of Japan Barreling toward a Bailout?” began to appear. While not a valid macroeconomic concern (see Cargill, 2005), the fact that market participants doubted the Bank's long-term commitment to support the market might have prevented interest rates from falling to the extent intended by the policy. Hence Bank of Japan credibility was called into question which in turn had macroeconomic consequences.

A second situation, discussed extensively in Frait (2005), is that of the Czech National Bank. As argued there, despite negative equity caused by revaluation losses on the CNB's foreign assets, the Bank's ability to achieve its policy objectives has not been impaired and at this time the Bank does not deem it necessary to enter into discussions about a recapitalization with government. Holub (2004) mentions two reasons why the CNB has established a credible foreign exchange intervention policy despite a need to sterilize large capital inflows

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<sup>19</sup> The Jamaica Observer Internet Edition, May 31, 2006.

<sup>20</sup> See J.P. Morgan (2002) and Business Week online (2003).

including those directly received from the public sector. The first is an agreement “...with the government [which] has included as its crucial part the government’s participation on sterilization costs incurred by the CNB due to the direct purchases of public foreign exchange revenues. This has made the agreement financially sustainable, and thus more credible.” The second was a decline in domestic interest rates to the point where the yield on acquired foreign reserves exceeded that on the instruments issued to finance the reserve accumulation. This latter phenomenon is in contrast to that in the vast majority of countries (see Rodrick, 2006).

The Central Bank of Armenia current situation bears some similarities to the Czech case. Low inflation, a strong fiscal situation, and rapid growth have led to a sharp increase in demand for local currency and an appreciating exchange rate. The central bank has suffered large revaluation losses on its foreign reserves yet this has been the result of successful policy. Over the longer term, the increase in demand for local currency and the decline in dollarization should generate increasing amounts of seigniorage revenue for the central bank.

Another interesting case is that of South Africa. Owing to extensive intervention in the forward foreign exchange market to support the value of the rand, the South African Reserve Bank (SARB) had accumulated a negative net open foreign current position of US\$23.2 billion at end-September 1998. The SARB attributed this perceived vulnerability as partly responsible for large fluctuations in the value of the rand and determined to eliminate it in order to attain a more stable rand, make the country less vulnerable to external shocks, and improve prospects for upgraded international credit ratings.<sup>21</sup>

This section has reviewed the situation in a number of countries pertaining to central bank financial strength and policy outcomes. It has been seen that in some cases central banks are not concerned with transient movements in profitability or net worth while in others losses have severely degraded policy capacity. A second underlying theme has been that measured capital is a poor summary statistic for central bank financial strength. That issue will be explored further in the next section.

#### **IV. EVIDENCE FOR THE IMPACT OF FINANCIAL STRENGTH ON POLICY PERFORMANCE**

In attempting cross-country empirical work on central bank financial strength one immediately is confronted by a problem. The market capitalization of central banks is not available, the policy environment is subjective and qualitative in nature and capital is a poor proxy for financial strength. Why is the alternative measure—balance sheet “capital”—an inadequate substitute? First, capital—as the accumulation of accounting profits not distributed plus the original endowment—depends on the accounting and profit distribution rules of central banks. There is a remarkable diversity of practice in these areas among central banks, which illustrates that what capital represents in one central bank is very different from what it represents in another bank and that dividends distributed over time are

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<sup>21</sup> See Governor’s address (2003) and (2004).



rarely at the discretion of management. In this context transparency of central bank financial information becomes paramount.<sup>22</sup>

An area where significant diversity is present is the treatment of revaluation gains and losses. Take, as an example, the IMF International Financial Statistics (IFS) data for “national valuation” of monetary authorities’ gold reserve holdings. Of 113 countries reporting data at end 2002, 72 valued their reserves at an average price within 10 percent of the U.S. dollar equivalent of the end-year London spot gold price (US\$342.75). Of the remaining 41, about half had valuations quite close or equal to US\$42 or US\$35 per ounce while the other half were mostly somewhere in between. This illustrates the diversity of accounting treatments.

As if the problems with accounting standards for balance sheet items were not enough, central banks often have potentially enormous off-balance sheet liabilities and assets. On the asset side, the present discounted value of all future seigniorage and inflation tax revenues could easily dwarf identified assets. On the liability side, the potential cost of bailing out bankrupt financial institutions, which has often cost double-digit percentages of national output, is not present on the balance sheet. Ignoring these factors would be very much like examining the balance sheet of a state oil monopoly without taking into account the value of its crude reserves under the ground or a disadvantageous informal commitment to supply certain markets at subsidized prices. Canada is a good example of how measuring financial strength by “capital and reserves” as shown on the balance sheet grossly understates the true situation. Annual Bank of Canada profits are generally 60 times capital and reserves and several times annual operating expenses at current interest rates. Operating expenses would be covered even if interest rates fell below 1 percent. Conversely, other central banks, such as Peru in the 1980s and Argentina in 1988, showed positive capital despite their dire financial situation which left them unable to confront high inflation.<sup>23</sup>

To gain a further glimpse into the state of central bank balance sheets it is interesting to examine the item identified in the IFS as monetary authorities’ “other items net (OIN).” This is the residual item after taking into account the asset items: foreign assets, claims on central government, claims on other levels of government, claims on financial institutions, and claims on the private sector, etc., and the liability items: reserve money, foreign liabilities, central government deposits, monetary authority securities, etc. that are explicitly identified. Taking this as an indicator which is simultaneously correlated with reporting transparency and central bank financial strength,<sup>24</sup> charts 2–5 show histograms of the ratio of OIN to total

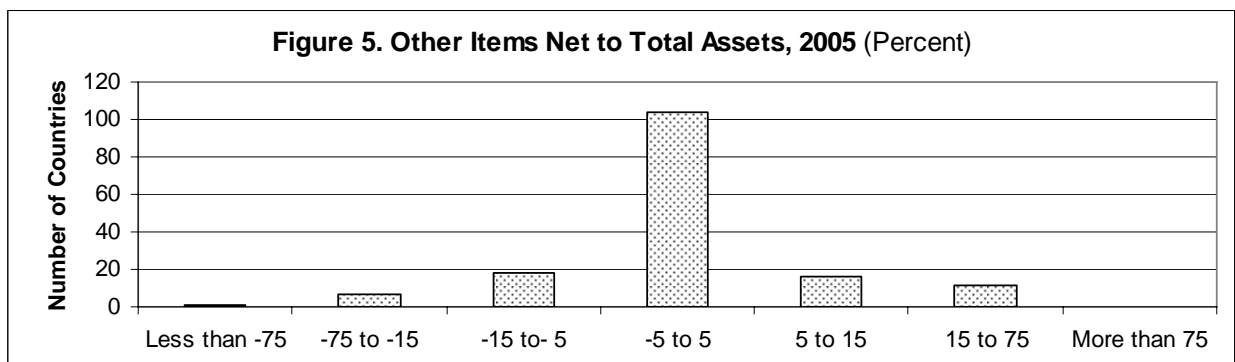
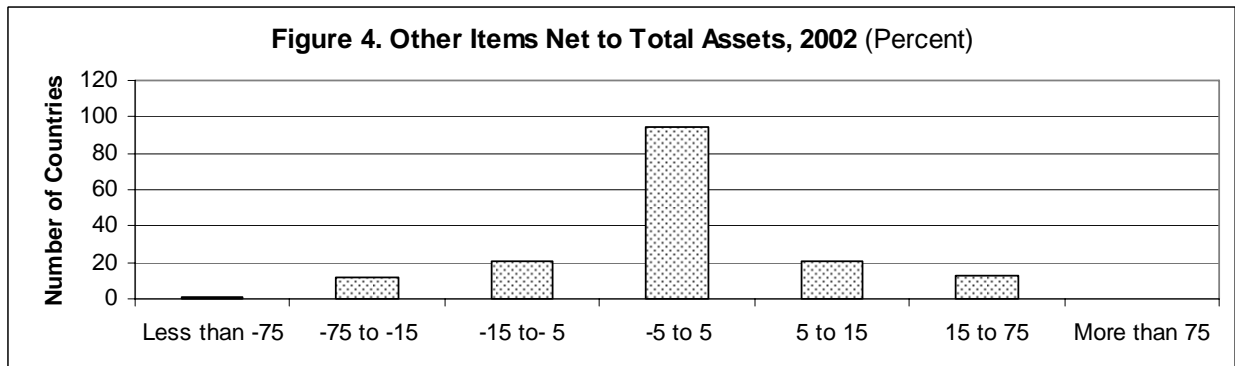
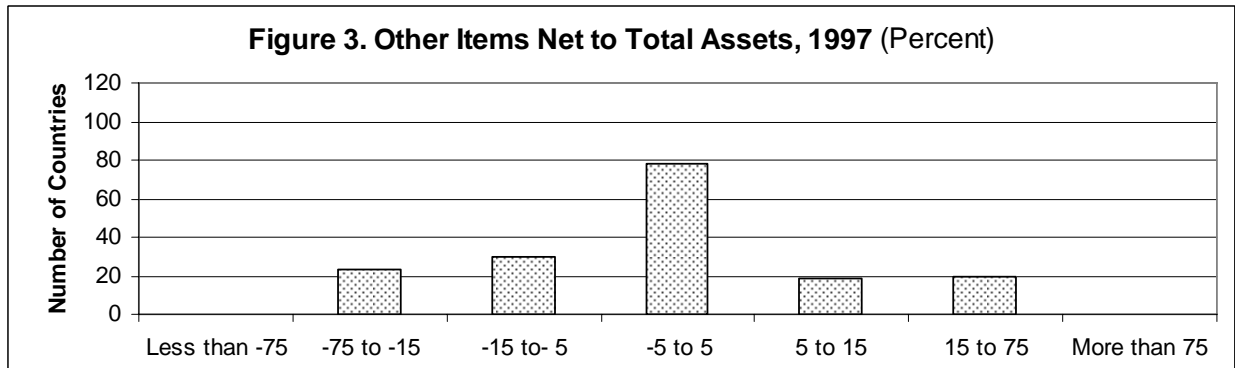
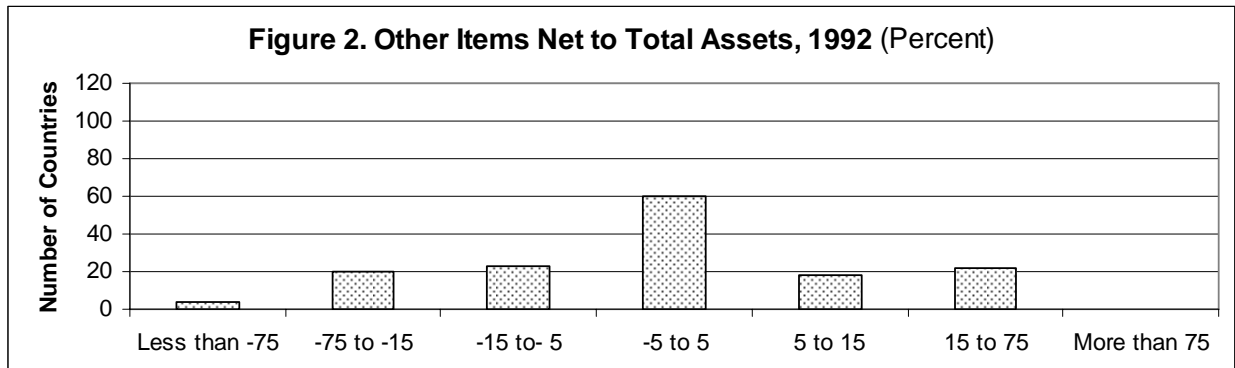
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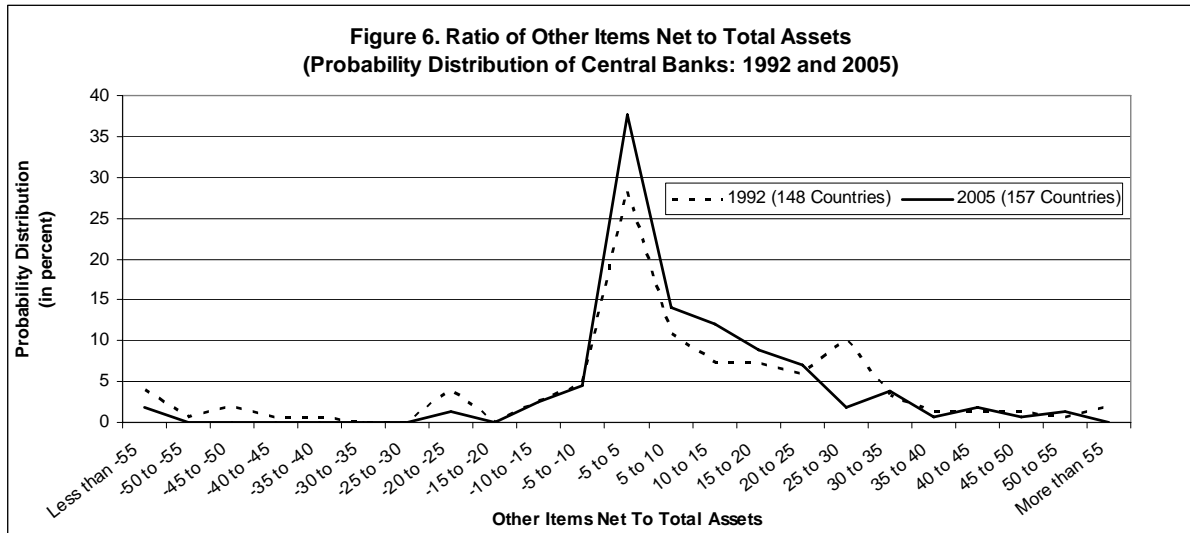
<sup>22</sup> The IMF has actively promoted central bank transparency through its “safeguard assessment” program. Introduced in 2000 these assessments seek, inter alia, to ensure transparency in the use of Fund resources entrusted to central banks and the reliable reporting of financial information. Safeguard assessments examine the adequacy of five key areas pertaining to the central bank: external audit, internal audit, legal independence, financial reporting, and internal controls. An essential requirement is that countries publish annual central bank financial statements that are independently audited in accordance with internationally accepted standards. Readers interested in reviewing the findings of the 111 Safeguards assessments completed, covering 69 central banks, may find a summary paper on IMF website at <http://www.imf.org/external/np/pp/eng/2005/033105.pdf>

<sup>23</sup> Central Bank of Peru Annual Reports; Braessas and Naughton (1997).

<sup>24</sup> The correlation with transparency is obvious. The correlations with the central bank financial strength is derived from the fact that OIN often contain accounts reflecting accumulated losses or “hidden” reserves.

assets for monetary authorities in 1992, 1997, 2002 and 2005 (for 148, 171, and 162, and 157 monetary authorities, respectively).





Source: IFS Database

Several observations could be made about the data. First, while there is certainly a large mass of the distribution where OIN is a relatively small portion of the total, there is a disturbing number of countries where it is quite large. In 1992, 60 monetary authorities, or 41 percent, reported OIN within a range of plus or minus 5 percent of total assets. Yet 46 (31 percent) actually had OIN in excess of plus or minus 15 percent of total assets. Second, comparing 1992 and 2005, we may clearly see significant improvement (Figure 5). For example, 104 out of 157 monetary authorities, or around two-third of the whole sample, were within plus/minus 5 percent in the latter year, while only 19, or 12 percent, remained beyond the 15 percent threshold. Another encouraging sign is that much of the improvement in transparency has come from the group where OIN was negative. That is, cases where identified assets were much less than identified liabilities, a sign of financial weakness.<sup>25</sup> In 1992, 47 monetary authorities had negative OIN in excess of five percent of assets of which 24 (16 percent) had negative OIN in excess of 15 percent of total assets. In 2005, only 26 had negative OIN exceeding five percent of assets, and the share of monetary authorities exhibiting negative OIN in excess of 15 percent of total assets had decreased to 5 percent.

Taking these observations as a starting point, it is clear that the evaluation of the relation between policy outcomes and central bank financial strength is complicated by the difficulty to measure the latter with sufficient precision. In particular, most measures of central bank capital will not be fully comparable, neither among countries, nor over time. While these difficulties must be recognized in statistical work attempting to draw empirical conclusions, cross-country as well as case study evidence clearly suggest a relation between central bank capitalization and policy performance. In particular, several studies show that average inflation is higher in countries with financially “weak” CBs.

<sup>25</sup> Put differently, unidentified assets exceed unidentified liabilities. Accumulated losses customarily would appear (unidentified separately) as an asset. Evaluating that asset at its true economic value (zero), would require an offsetting write-down of capital.

For example, in the sample used to construct the charts above, countries in which the sum of capital and other items net was negative in 1992, 1997, or 2004 (“weak” central banks), had an average inflation rate more than twice as high compared to those countries with financially “strong” central banks, i.e. those in which the respective sum was positive (see Table 4, which also reports results from a one-tail t-test).<sup>26</sup> These results are in line with earlier findings by Stella (2003), who presents similar evidence for a slightly smaller sample, and for the years 1992, 1996, and 2002. Ize (2006), using a different sample and data on central bank losses, shows that countries where central banks have made losses had levels of inflation almost three times as high as countries with profitable central banks (9.2 percent versus 3.7 percent in 2003). A more sophisticated and comprehensive econometric analysis is forthcoming in Klüh and Stella (2008).

**Table 4. Inflation Performance and Financial Strength 1/**

	Weak CB	Strong CB
Mean Inflation	23.8	11.2
Observations	111	328
t Stat	3.28	
P(T<=t) one-tail	0.00	
t Critical one-tail	2.33	

Source: IFS Database

1/ The mean inflation rates were calculated using country observations in 1992, 1997, and 2004.

In addition to cross-country comparisons, time-series evidence for specific country examples strongly supports the proposition that financial strength matters for policy outcomes:

- In **Hungary**, during the three years prior to the recapitalization of the central bank (NBH) in 1997, the average rate of inflation was 23.5 percent and the average yield on 90 day treasury securities was 27.6 percent. In the three years following the recapitalization, inflation averaged 11.4 percent and the 90 day treasury rate averaged 14.4 percent. Real growth also increased from an average of 1.9 percent to 4.8 percent.
- In **Jamaica**, inflation averaged 31 percent during the years 1987–1993 while the central bank was registering significant losses. The losses stopped in 1995 following a recapitalization with government securities and inflation averaged 12 percent during the period 1995–2000.
- In **Peru**, following a recapitalization and a new central bank law in 1992 eliminating central bank quasi-fiscal activities, losses as a percentage of central bank liabilities to the private sector fell from close to 31 percent in 1991 to 2½ percent in 1994 as the

<sup>26</sup> Hyperinflationary outliers were corrected, using the approach in Stella (2003), to preserve comparability.

central bank accounts came into virtual balance. Peru's financial sector exhibited strong growth in the liberalized environment which included reductions in required reserves, with broad money to GDP rising from 12 percent at the end of 1991 to 21½ percent in 1997. Bank supervision and the prudential framework were also strengthened. The central bank's operating balance turned positive in 1996 and has remained so in recent years at low, single-digit inflation rates.

- In **Uruguay**, losses averaging 3 percent of GDP in the late 1980s were brought down to ½ percent of GDP by 1995 as the central bank transferred to the treasury outstanding external liabilities related to the mid-1980s purchase of loan portfolios from troubled commercial banks and gradually began to replace its own bills with treasury bills in the conduct of open market operations. By the end of 1993, the entire stock of central bank bills had been replaced and the cost of open market operations was being borne by the treasury.<sup>27</sup> Inflation averaged 81 percent in the years 1986–1992 while the central bank's capital position was negative, while it averaged 18 percent during 1994–2000 when capital was positive. Central bank losses reached a trough of 0.2 percent of GDP in 1999 before rising to 0.4 percent of GDP in 2003 in the wake of the recent financial crisis, which witnessed a dramatic decline in central bank net foreign assets.
- In **Nicaragua** in 1995, following years of losses, the central bank suspended all financing of the state-owned banks and the government began to make significant debt-service payments on its central bank debt, with the result that the latter's operating position came into balance for the first time in a decade.<sup>28</sup> However, the banking problems that emerged in 1998 led to a large provision of central bank paper to intervened commercial banks, thereby giving rise again to losses as well as to potential difficulties in rolling over the obligations. A partial response of the authorities had been to increase commercial bank reserve requirements, a tax on financial intermediation. The situation worsened as the cost of resolving four banks that failed during the year August 2000–2001 led the central bank to issue dollar-indexed bonds totaling 20 percent of GDP. Part of this debt has recently been restructured.<sup>29</sup>

## V. ENHANCING CENTRAL BANK FINANCIAL STRENGTH: METHODS AND INSTRUMENTS

Central bank financial strength has been enhanced in a variety of different ways in different countries usually employing a combination of financial transfers and policy reforms. In

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<sup>27</sup> See IMF (1996a). A similar process took place in **Brazil**. The Brazilian Law of Fiscal Responsibility required the central bank to cease issuing its own debt effective May 2002, at which time all monetary operations began using government securities. As part of the process the Brazilian treasury provided the central bank with a stock of marketable securities. These securities have been used in repurchase transactions which have been the principle instrument used to absorb the liquidity created by the redemption of maturing central bank debt.

<sup>28</sup> See IMF (1996b).

<sup>29</sup> See IMF (2001 and 2004).

almost all cases of which we are aware, central bank financial difficulties have arisen from the assumption of quasi-fiscal activities on the part of the bank in the past and/or the cost of sterilizing the accumulation of foreign exchange reserves. Hence, central bank financial strength can be greatly enhanced by commitments to eliminate or reduce the frequency of quasi-fiscal operations—the most important of which in the last 25 years worldwide has been commercial bank rescue operations. Hence, a strengthening of bank supervision, and particularly of the balance sheets of state-owned commercial banks, indirectly strengthens the central bank.<sup>30</sup>

The provision of credit at below market rates to government and public enterprises has been another important contributor to central bank losses, particularly when debt service on these loans is deferred, rescheduled or not effectively made. Eliminating the possibility of such credit has been an important component of the wave of legal reforms to central bank organic laws throughout the world in the last 15 years.

A willingness to accept the possibility of greater exchange rate flexibility and consequently a lesser target level of reserve accumulation can also stabilize central bank finances by reducing the need to accumulate costly foreign exchange reserves. In some countries, the results of an acceptance of greater exchange rate flexibility and consequently a lesser target level of reserve accumulation may immediately be seen in a reduction in the volume of domestic monetary instruments needed to absorb the domestic liquidity consequences of foreign exchange purchases. Over time, a reduction in the value of foreign exchange reserves relative to GDP would lessen the central bank's cost of financing those reserves. Another alternative is to have government own the foreign reserves or for the central bank to enter into derivative transactions with government to transfer some of the risks associated with foreign reserves management to government, who may be able to manage those risks through its debt management activities.

An alternative way to strengthen a central bank facing sterilization costs has recently been employed in India, where the central bank (RBI) and government have reached an agreement that the RBI may issue government debt to sterilize the liquidity created by foreign exchange purchases. The domestic currency proceeds from the debt sales are deposited at the RBI in a non-interest bearing account, thus the government bears the full cost of the sterilization.<sup>31</sup> As noted earlier, Holub (2004) points to a similar arrangement in the Czech Republic.

The most straightforward way to recapitalize is through the transfer of cash and securities. Conceptually one can contrast the *immediate* transfer of cash and securities—which are instruments that pay cash over a specified time period—and promises to provide securities in the future. Historical evidence in many countries suggests that promises to provide securities

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<sup>30</sup> This issue has been particularly relevant as many central banks have directly or indirectly financed costly bank rescue operations. The resultant problems have led some to argue that the central bank's ability to undertake such operations should be restricted or transferred to the government—see Jácome (2001) and Dornbusch (2001).

<sup>31</sup> This actually improves central bank profitability. A neutral outcome for the central bank would occur if it paid the average rate of return on its foreign reserves to the government on its deposit.

at some time in the future are seldom kept, particularly in crisis situations when central bank financial strength is essential for maintaining central bank credibility (see Stella, 2005).

The use of cash is fairly rare, although it has been employed in recent years in **Norway** and **Costa Rica**. Norway's significant oil and gas export revenues made a transfer to the Norges Bank relatively easy, and the transfer in terms of GDP (2002) was not very large (0.6 percent). In the case of Costa Rica, in 2004, the government borrowed on international financial markets in foreign exchange and provided the proceeds to the central bank (BCCR). This transfer was not quantitatively significant enough to eliminate the BCCR's negative equity nor eliminate central bank losses.<sup>32</sup> In **Chile**, the Congress approved a series of transfers to the central bank amounting to 0.5 percent of GDP for 5 years beginning with US\$606 million in December 2006.

Ministries of finance are usually reluctant to provide cash. They are rarely in such a strong liquidity position to provide significant amounts of cash to the central bank from their account balances and in most cases domestic financial markets are not able to absorb large issues of debt outside the normal treasury domestic financing plan. That said, it should be possible to coordinate additional treasury issuance with redemption of central bank securities if they already exist in the market.<sup>33</sup>

The financial strength of the **South African Reserve Bank** (SARB) was enhanced through a variety of mechanisms in the context of the elimination of the negative net open foreign currency position. The forward book has been a structural imbalance for some time, which stemmed from a combination of providing forward cover to South African companies and intervention in the foreign exchange market during the 1980s and 1990s. Losses on the forward book were, in terms of the South African Reserve Bank Act, borne by the National Treasury. These losses were booked to the "Gold and Foreign Exchange Contingency Reserve Account (GFECRA), and reflected as an asset on the balance sheet of the Reserve Bank until the final outstanding balance was settled on April 1, 2005. The GFECRA, which is operated in terms of section 28 of the South African Reserve Bank Act, represents the net valuation profits and losses incurred on gold and foreign exchange reserves which are for the account of the South African Government. Settlement of this account occurs from time to time as and when agreed between the SARB and the government.

The settlement of the GFECRA was done through a combination of cash payments and transfers of bonds. Cash payments by the government drained liquidity from the money market on a permanent basis, while the SARB used the bonds to drain liquidity from the money market through reverse repurchase transactions. Further accumulation of foreign

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<sup>32</sup> See Central Bank of Costa Rica Memoria Anual 2004, p. 41.

<sup>33</sup> This was done in Mexico in August 2006. See "Resultados de la Colocacion de Bondes D y Prepagos Adicionales de Deuda Externa," Press Release 064/2006, Secretaría de Hacienda y Crédito Público, August 10, 2006.

exchange reserves has been partly funded by a contra-deposit of government funds at the SARB, which earn interest in line with the average return on foreign reserves assets.

Central banks are more frequently capitalized with securities, often in ways that reflect the nature of the obligations facing them. In the case of **Hungary**, the central bank (NBH) faced serious problems with external debt it had contracted both to onlend to government and to accumulate foreign reserves which were subsequently used to support the exchange rate. The government recapitalized the central bank with a portfolio of foreign exchange securities which matched exactly the currencies and cash flows of the NBH obligations.

As noted above, the Central Bank of **Costa Rica** has had a negative equity for a number of years. In 2006, a definitive solution was proposed in a draft law which would have provided the BCCR with domestic marketable securities matching the present discounted value of its domestic interest bearing liabilities (bonos de estabilización monetaria, certificados de depósito, and others) while the government would directly assume the obligation to pay the BCCR's external debt. Currently, an alternative solution is being explored.<sup>34</sup> A recent strengthening in tax collections has provided the fiscal space to enable a solution.

The use of *nonmarketable* securities to strengthen a central bank has serious disadvantages. In their worst form, these securities are no more than badly applied cosmetics which hide the true economic nature of the problem. In **Peru**, in the early 1990s, the “Budget financing law” called for the consolidation each year of treasury borrowing from the central bank into treasury bonds with 100 year maturity at an annual interest rate of 0.1 percent. At the high rates of inflation prevailing at that time the real value of this debt was quickly reduced to almost zero. In **Ghana**, the ministry of finance issued certificates to the central bank to the extent that the central bank made losses on the revaluation of the BOG's liabilities to the IMF and other international organizations. These certificates bore no interest, were nontransferable and did not appear to have any stated maturity dates. In **Honduras**, the government covered the losses of the central bank reflected in the end-1996 balance sheet with a 50-year bond that does not accrue interest and is not tradable. The face value of this transaction amounted to over 1 percent of GDP but the economic value is close to zero.<sup>35</sup>

None of these operations with nonmarketable claims improved the real financial strength of the central bank; they led instead to a deterioration of the transparency of the central bank balance sheet and weakened government fiscal credibility.

Central bank capitalization with *marketable* securities offers a rare opportunity to “jump start” the development of domestic debt markets. Many countries with central banks in financial distress suffer also from shallow or underdeveloped domestic financial markets. This is not surprising given the close association of central bank financial distress with high and variable inflation, dollarization and financial repression (stringent financial regulations

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<sup>34</sup> <http://www.imf.org/external/np/sec/pr/2007/pr07289.htm>

<sup>35</sup> IMF Country Report No. 02/16, Honduras: Report on the Observance of Standards and Codes—Fiscal Transparency Module, February, 2002.



designed to force the financial system to hold high levels of unremunerated deposits at the central bank or in government/central bank securities). A recapitalization of the central bank can strengthen its ability to achieve low and stable inflation and provide it with securities that can be placed in the market either through outright sales or repurchase agreements that can serve as a foundation for the development of an active money market. The money market, in turn, could be the first step in developing a government debt market.

## **VI. CONCLUDING REMARKS**

Central bank financial strength is positively associated with good policy performance. Financially weak central banks generate losses which undermine macroeconomic stability and call into question the credibility of their policies.

In assessing central bank financial strength a careful examination of the policy regime and the volatility of the economic environment is necessary. Conventional measures of private enterprise financial strength—profitability and capital—can be very misleading when applied to central banks.

The way in which a central bank balance sheet is strengthened matters. Providing the central bank with marketable government debt that can be used to develop a money market—that in turn may become the locus of central bank monetary operations—serves both to directly strengthen the institution and improve the quality of the environment in which it operates, thereby facilitating the attainment of its ultimate performance objectives. On the other hand, pure “cosmetic” solutions, such as providing the central bank with long-term nonmarketable non-interest bearing securities, provide no effective assistance to the central bank nor provide it with instruments it can use in implementing policy.

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