

Who Signs Banknotes and Why? Issues in Central Bank Finance

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Abstract

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Conventional economic models focus only on selected elements of the central bank balance sheet, in particular monetary liabilities and sometimes foreign reserves. The usual model of an “independent” central bank assumes that it chooses money (or an interest rate), unconstrained by a need to generate seignorage for government. That an independent central bank could be constrained in achieving its policy objectives by its *own* balance sheet situation is a relatively novel idea. This paper discusses the latter case within a general context we loosely call “central bank finance.” Following a discussion of why these issues are attracting attention, we consider the view of several influential observers who have suggested these concerns are void of merit. These views are based on the idea that central banks and treasuries are closely integrated and that central bank balance sheet concerns can only be considered as an integral part of the state balance sheet. We consider several strands of evidence that run contrary to this claim. First we examine 135 central bank laws to illustrate the variety of legal approaches adopted, in particular those explicitly rejecting the idea that the treasury is responsible for central bank liabilities. Second, we examine the same data set with regard to central bank recapitalization provisions to show that even in cases where the treasury is nominally responsible for maintaining the central bank financially strong, it may do so in purely a cosmetic fashion. Third, we show that, in actual practice, treasuries have frequently not provided central banks with genuine financial support on a timely basis leaving them reliant on seignorage to finance their operations and/or forcing them to abandon policy objectives. Fourth, we construct and analyze the results of a database containing the characteristics of the banknotes of 184 countries, particularly whether the signatures contained thereupon are those of central bank or government officials. The results are suggestive of the historical reasons for the prominence of the rather singular U.S. view of central bank and treasury relations.

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I. INTRODUCTION

This paper discusses several issues in what might be termed “central bank finance.” A particular focus is placed on the financial structure of the central bank balance sheet—certain elements of which pertain to central bank financial independence; but governance, policy performance, accountability, and accounting are also discussed.

The issue of central bank finance has been lightly covered or is considered to be fully subsumed within more general topics such as public finance or corporate finance. The index of Stiglitz’s textbook “Economics of the Public Sector” does yield a reference to “central bank” in a footnote on page 26 to the discussion of how to define the public sector, in particular to the proposition that although in some countries the banking system is publicly owned, in the United States it is not. The footnote points out that the Federal Reserve Banks “...which are responsible for the management of the banking system, are publicly owned.” The index of Tirole’s “The Theory of Corporate Finance” yields no mention of central banks.

The view taken in this paper is that for some purposes it is appropriate for the government’s consolidated budget and balance sheet to be the focus of attention and hence, the principles of public finance apply. For example, in evaluating sovereign debt sustainability or the overall fiscal stance, consolidating the operations and balance sheet of the treasury and central bank is essential to obtain a full picture of the situation². For other purposes, however, it is important to evaluate the corporate financial structure of the central bank as a stand-alone entity. This is particularly the case when one is evaluating the credibility of an independent monetary policy³.

These views are controversial, however, as is the substance of the concept of central bank financial independence. The controversy will be reviewed in the next section of this paper. In the remainder of this introduction we will discuss why these issues have surfaced recently.

In part, the impression that central bank finance is a new concept is illusory and reflects a certain innocence or ignorance in certain parts of the world where central banks have been habitually quite profitable and seemingly unconstrained (in a fiat money world) or subject to strict limits on the nature of their balance sheets (under metallic standards). Part of the failure to see the relevance of central bank financial strength is clearly related to the situation in most countries where the textbooks have been written and published. The U.S. Federal Reserve system has made a profit every year since 1915. De Nederlandsche Bank has made a profit every year save one since 1814. Walter Bagehot, in his classic “Lombard Street,” wrote “Of the ultimate solvency of the Bank of England, or of the eventual safety of its vast

² Robinson and Stella (1987), *Amalgamating Central Bank and Fiscal Deficits* in *How to Measure the Fiscal Deficit*, ed. Mario I. Blejer and Adrienne Cheasty. IMF (2002) Manual on Fiscal Transparency.

³ By independent here we mean neither constrained to pay specific dividends to government nor the recipient of automatic treasury coverage of losses.

capital, even at the worst periods of its history, there has not been the least doubt” (page 208, 14th ed., 1873).

However, in other parts of the world, these issues have been quite prominent for decades, in particular, those difficult situations where central bank financial structures have been debilitated by quasi-fiscal operations. Central banks have been unable to meet their most basic functions—including supply of banknotes—owing to financial distress; have changed policy in order to reduce losses and, in at least one case—have been placed into liquidation.

In a number of cases, the root of long-standing problems has been the provision of credit to ailing banking systems and the respective central banks’ subsequent attempts to issue debt to control their immediate macroeconomic consequences.⁴ In those situations, central banks have found themselves financially weakened (abandoned rather than independent)—and highly constrained in terms of policy options—whatever the legal or theoretical considerations that suggest that they should have been supported by treasuries. As the current president of the Central Bank of Costa Rica has said “We, the central bank, have a negative net worth...and this remains our greatest challenge.”⁵

More recently, concerns have been raised about (potential) financial difficulties being registered by advanced country central banks—and in central banks in important emerging financial markets.⁶ Here it is useful to separate the recognition of financial losses and the actual causes of the losses.

Regarding the *recognition* of financial issues, the general movement toward greater financial transparency in central bank financial accounts has been apparent over the past 15 years.⁷ This has been accompanied by improved clarity in world accounting standards for corporations in general. Of particular relevance in this respect is the gradual adoption of International Financial Reporting Standards (IFRS) for corporates, which has spread to certain central banks.

A key element of IFRS is the requirement that foreign exchange revaluation changes be brought to the profit and loss account of the entity in question. As most central banks—as an essential element of their institutional roles—have large net exposures to foreign currencies, the adoption of IFRS brings with it the possibility of volatile income and balance sheet statements. Even in those countries where IFRS has not been adopted, there has been a worldwide trend to adopt mark-to-market and/or fair value accounting for assets and

⁴ A good recent example is the Dominican Republic. See <http://www.bancentral.gov.do/actividades.asp?a=bc2006-11-08>

⁵ Francisco de Paula Gutierrez, as interviewed in *Central Banking*, vol. XV, No. 4, May 2005, page 82.

⁶ For example, “Is the Bank of Japan barreling toward a bailout?” *BusinessWeek* online February 3, 2003 (http://www.businessweek.com/magazine/content/03_05/b3818169.htm).

⁷ See Stella (2007), “Central Bank Financial Strength and Macroeconomic Policy Performance”, Bank of England Centre for Central Banking Studies Conference Volume (forthcoming).

liabilities. Thus central banks which previously might not have revalued their assets frequently or might have valued them at arbitrary values, are increasingly recognizing asset price volatility.

Whereas in the past, central banks might have set aside revaluation losses and/or accumulated losses in opaque asset accounts, they are now more likely to reflect these losses in the profit and loss accounts and in equity. Thus the risks coming from heightened exposure in particular to foreign exchange revaluation losses have become more apparent. The combination of this trend with mechanical rules for distribution of central bank profit that were designed for a less volatile environment raises an important corporate finance issue that will be touched upon later.

Apart from the increased recognition of volatility, central banks have become more exposed to volatility and under increased profit pressures. Volatility has risen as central banks have accumulated large volumes of foreign exchange reserves, in absolute terms and as a proportion of their assets. This has been the case particularly in countries experiencing current and capital account surpluses—energy exporters and high real growth exporters in Asia. This increase in the exposure of central banks to exchange rate volatility has been noted both by researchers and the financial press⁸. This accumulation of foreign exchange reserves has exposed those central banks both to potential revaluation losses were their currencies to appreciate against the major international reserve currencies and to cash flow losses. The cash flow losses result from the issuance of central bank debt to sterilize the local currency counterpart of foreign exchange purchases when exchange rate appreciation has been resisted. The global rise in the magnitude of capital flows, in relation to the size of central bank balance sheets, has increased central bank balance sheet leverage. These factors have contributed to a rise in the risks inherent in the balance sheet and consequently to a rise in the risk that central bank capital—as conventionally defined—may be exhausted.

Another factor behind the concern regarding central bank finances has been a global decline in inflation and consequently declining central bank income from the inflation tax⁹. With a reduction in the quantity of non-interest bearing money, lower inflation, and rising foreign exchange sterilization costs and revaluation risks, the prospects of central bank losses have increased. Somewhat preceding this decline in inflation in many countries has been a reduction in the quantity of unremunerated reserve requirements and lessened taxation of the financial system. Globalization of capital flows has played a part in this, beginning in the 1970s with the development of the Eurodollar market largely motivated by the desire to avoid restrictive U.S. regulations. This enhanced competition for U.S. domiciled banking activity

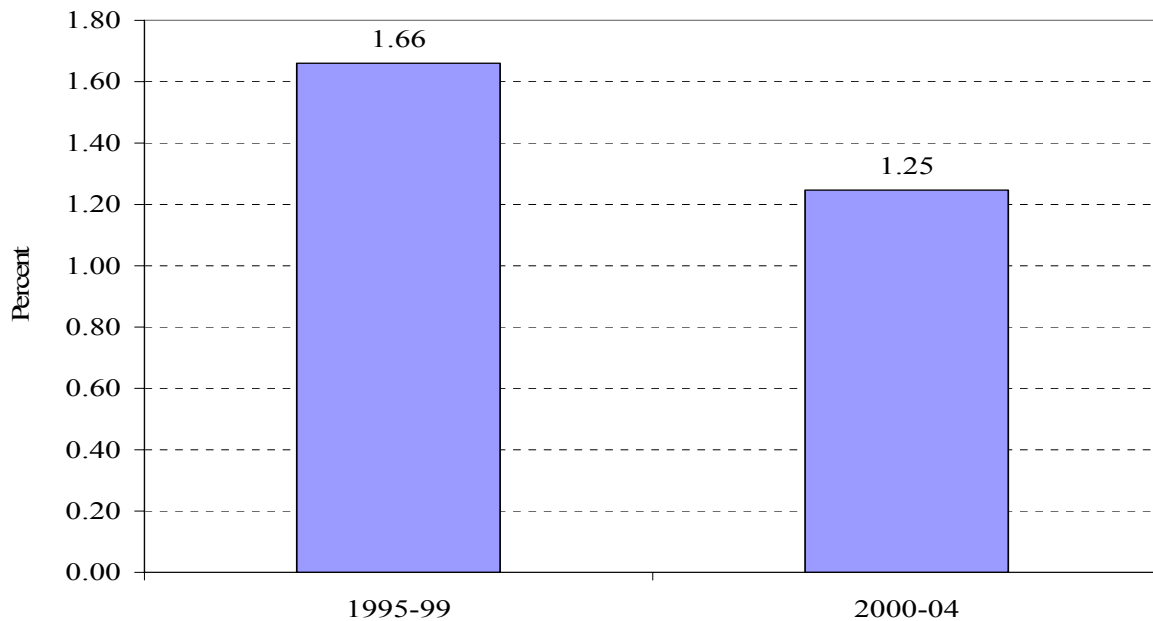
⁸ See *The Economist* (2005) April 30–May 6. Sims (2003a) points out the higher relative exposure to foreign exchange revaluations of the ECB compared to the Fed. Stella (1997) suggests that the (then) capital policy of the Bank of Norway arose for similar reasons.

⁹ The global decline in inflation has undoubtedly slowed the erosion of central bank seigniorage, i.e., income from the monetary base at zero inflation, that has resulted from technological innovation but this has not been sufficient to reverse the clear overall trend.

eventually was met with reduced regulation. The globalization of currencies and ease of cross-border financial transactions is now a world wide phenomenon. Indeed the spread of sophisticated financial products and enhanced technological capacity to transfer funds across borders is seen by some to be the root cause for the worldwide decline in inflation¹⁰. Thus the capacity of the central bank to impose taxes on its regulated financial sector has been reduced.

There has been a global trend of increased central bank corporate leverage and risk, potentially larger contingent liabilities arising from growth in domestic and international financial markets coupled with the central bank's role in providing lender of last resort financing, rising sterilization expenditures, and declining income. Evidence of the magnitude of the last factor is provided in Figure 1 below.

Figure 1. Median Return on Average Assets in a Sample of 91 Central Banks 1/
(Median Value)



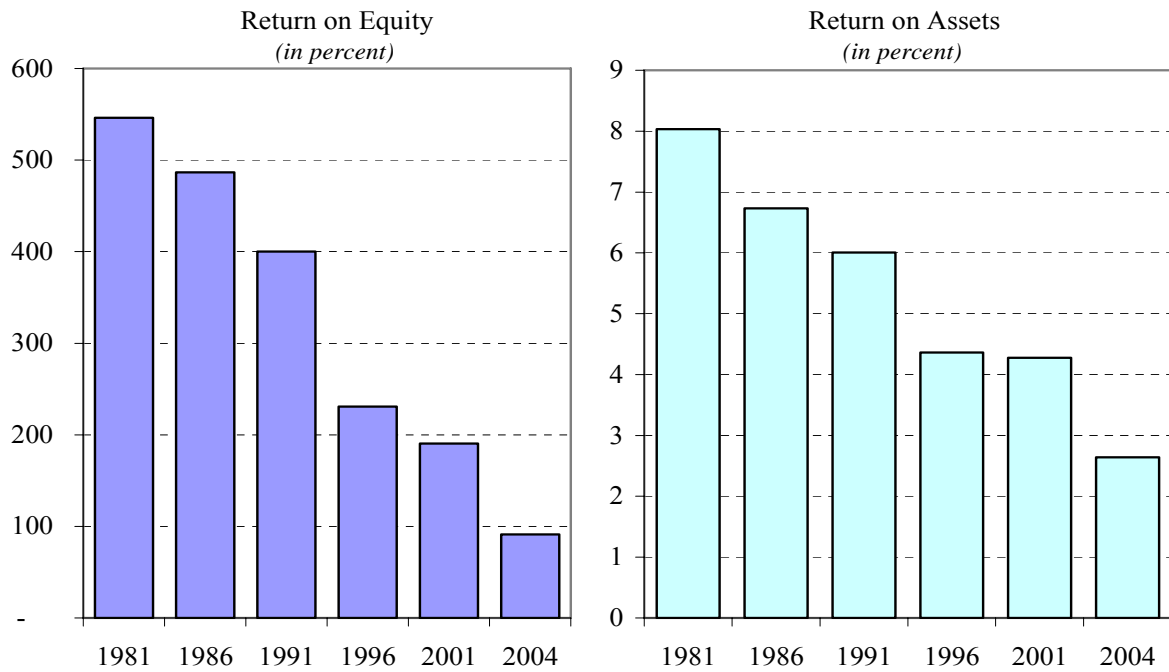
1/ Countries with less than 3 observations in each subperiod were eliminated from the sample.
Source: Bankscope.

Examining the median is intended to provide a global overview of trends and clearly masks different situations in different countries. Perhaps the most prominent case of recent concern has been that of Japan where the deflation problem reached its most profound level since the Great Depression era.¹¹ In other countries the situation remains quite comfortable but the trend is also evident in Figures 2 and 3.

¹⁰ See Randall S. Kroszner (2006) "The Conquest of Worldwide Inflation: Currency Competition and Its Implications for Interest Rates and the Yield Curve"
www.federalreserve.gov/boarddocs/speeches/2006/default.htm

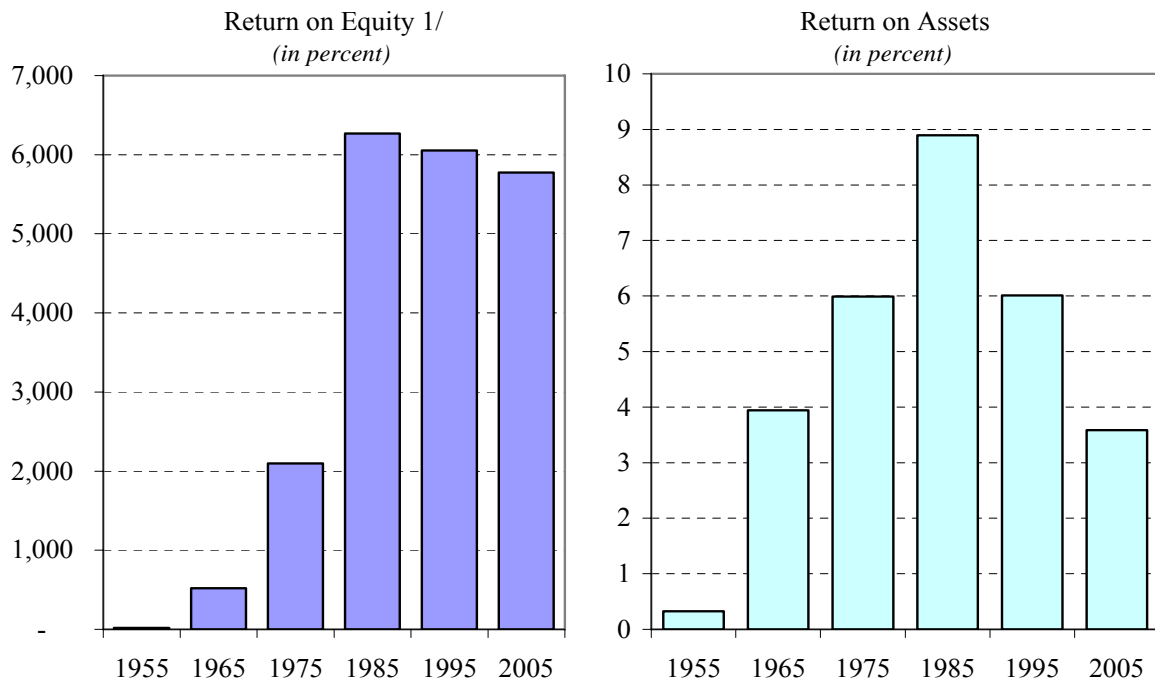
¹¹ See Goodfriend, Jeanne, Olivier and Lars E. O. Svensson (2004) "Credible Commitment to Optimal Escape from a Liquidity Trap: The Role of the Balance Sheet of an Independent Central Bank" IMF Working Paper WP/04/162, Okina (1999), Cargill (2005), Sims (2003a).

Figure 2. U.S. Federal Reserve System



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

Figure 3. Bank of Canada



1/ Includes C\$5 million in capital and C\$25 million in the "Rest Fund."
 Source: Bank of Canada, Annual Report, various issues.

The last reason to be discussed here is the increased attention given central bank independence in the last two decades and in particular the delineation by the European Union of financial independence as one of its key components. The creation of the European Central Bank led to considerable thinking about central banking best practice in general and to central bank independence in particular.¹²

The European Union, through the European Monetary Institute (the precursor to the European Central Bank) has stressed the importance of central bank financial independence as an element in overall independence.¹³ That this issue is taken seriously can be seen in the determination by the Commission of the European Communities that Swedish legislation in 2002 "...is assessed not to be compatible with the Treaty and the ESCB Statute."¹⁴ and in the Opinion of the European Central Bank expressed on proposed government amendments to the Suomen Pankki Act (Finland's central bank).¹⁵ In both cases, the fiscal relationship between the State and the central bank was not deemed sufficiently well-defined to ensure that the central bank would always have adequate financial resources to meet its obligation under the Treaty.

II. IS CENTRAL BANK FINANCIAL INDEPENDENCE A SENSIBLE CONCEPT?

A. Technical Insolvency vs. Policy Insolvency

Hopefully, it is obvious that the point of analyzing financial issues as they pertain to central banks is not with a view to assessing profitability. The graphics provided in section I are useful as indicators of central bank financial stress. They, in turn, are useful only if they have some correlation with policy performance. The preliminary econometric evidence suggests that central bank financial strength is so correlated.¹⁶ Supportive evidence is also available in numerous case studies.

However, there are important voices suggesting that the concept itself—central bank financial strength—is not sensible. Either because a central bank—having the power to create

¹² See *Legal Aspects of the European System of Central Banks*, ed. Amicorum and Zamboni Garavelli, European Central Bank.

¹³ EMI (1998) "Convergence report" if an NCB (national central bank) is fully independent from an institutional and functional point of view, but at the same time unable to avail itself autonomously of the appropriate economic means to fulfill its mandate, its overall independence would nevertheless be undermined. In the EMI's opinion, NCBs should be in a position to avail themselves of the appropriate means to ensure that their ESCB-related (European System of Central Banks) tasks can be properly fulfilled. Page 295.

¹⁴ European Monetary Institute, 2002, Convergence Report, (Frankfurt). www.ecb.int/pub/pdf/conrep/cr2002en.pdf

¹⁵ European Central Bank, 15 October 2003 (CON/2003/22) and 20 January 2004 (CON/2004/1).

¹⁶ See Ize (2006), Stella (2007), and Klueh and Stella (2007), forthcoming.

money—need not worry about its financial situation and/or the treasury will always stand behind it with its capacity to tax.

A more cynical view is that the treasury always controls central bank finances, whatever the law might say. Hence the “public finance” view is valid always and everywhere. Buiter (2006) argues that although a central bank may be able to resist, for a time, attempts by the treasury to appropriate its assets, ‘Ultimately, a determined treasury will be able to overcome such obstacles, be they conventions, laws or constitutional arrangements, provided there is popular political support for such depredations.’¹⁷

The close integration view appears prevalent in U.S. official circles. For example, in remarks given by Alan Greenspan: “When there is confidence in the integrity of government, monetary authorities—the *central bank and the finance ministry*—can issue unlimited claims denominated in their own currencies and can guarantee or stand ready to guarantee the obligation of private issuers as they see fit....Central banks can issue *currency, a non-interest-bearing claim on the government*, effectively without limit. They can discount loans and other assets of banks or other private depository institutions, thereby converting potentially illiquid private assets into risk less *claims on the government in the form of deposits at the central bank*. That all of these claims on government are readily accepted reflects the fact that a government cannot become insolvent with respect to obligations in its own currency. A fiat money system, like the monies we have today, can produce such claims without limit.”¹⁸ (Emphasis added).

This is quite an unequivocal and strong form of the integrated central bank and government view. Both currency and deposits at the central bank—the entire monetary base—are considered to be the direct liability of the government.

A different perspective—but arriving at the same conclusion that the central bank’s financial situation should not be a cause for concern—is found in a statement of Laurence H. Meyer before a U.S. congressional committee: “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.”¹⁹

¹⁷ While we agree with this statement, we do *not* agree with the notion that in situations where there is, or has been, political support for central bank independence, laws, institutional arrangements and central bank financial strength are irrelevant for credibility and policy outcomes during a meaningful time horizon. In the long run, of course, all laws, arrangements and constitutions can be modified.

¹⁸ Remarks by Chairman Alan Greenspan at the Catholic University Leuven, Leuven, Belgium January 14, 1997. “Central Banking and Global Finance”
<http://www.federalreserve.gov/boarddocs/speeches/1997/19970114.htm> .

¹⁹ Statement of Laurence H. Meyer, Board of Governors of the Federal Reserve System, before the Committee on Banking and Financial Services, U.S. House of Representatives, May 3, 2000, page 7.

A third view, coming from a still different perspective was expressed by the U.S. General Accounting Office after assessing the appropriate level of Federal Reserve System capital: “We found no widely accepted, analytically based criteria to show whether a central bank needs capital as a cushion against losses or how the level of such an account should be determined.”²⁰

These statements raise a number of interesting issues, the most important of which is not whether the government/central bank can meet its temporary liquidity requirements in local currency but whether other government commitments would be violated—in real terms—were the central bank to exercise its power, i.e., create enough money to meet all of its (and government’s) securitized and monetary obligations.

Viewed as an integrated whole, the point, as Sims (2003b) has shown, is that there are clear limits to a government’s, and central bank’s, ability to commit to an inflation target in the absence of a fiscal anchor.²¹ From the viewpoint of an independent central bank the point is that the actions necessary to avoid its own financial default circumscribe the strength of the policy outcome the central bank can orchestrate—even supposing it has no financial commitment to its shareholder(s) and no domestic currency liquidity constraint.²² Thus the interesting focus of analysis is not whether the central bank can avoid technical insolvency but whether the central bank can meet its policy commitments given its financial situation.²³

This distinction between technical insolvency and policy “bankruptcy” can be traced back a considerable time. As cited above, Bagehot (1873) argues essentially that no one even dreams the Bank of England could be insolvent. But later in the book he notes that the Bank of England’s Banking Department had failed three times. How to reconcile this with the safety of the capital? The answer lies in the power of the government to change or suspend the law governing the conversion of Bank of England obligations into specie (gold or silver coins or bullion). Thus the Parliament’s ability and willingness to suspend the law, not the Bank’s ability to create claims, is what protected the Bank’s capital. Which brings us back to the original point, that if the ultimate policy goal was to maintain convertibility and liquidity in the market, had not the Bank failed, even though, with the suspension of conversion, its capital was preserved?

B. Policy Insolvency—Does the Central Bank Balance Sheet Alone Matter?

If we accept that policy insolvency is the more relevant concept this does not necessarily imply that the central bank financial situation—independently—is worth analyzing. Indeed, the question posed above, in the integrated view, would likely be answered in the negative.

²⁰ U.S. General Accounting Office (2002).

²¹ Sims (2003b).

²² Ize (2005) provides an insightful discussion of the situation facing the Central Bank of Costa Rica.

²³ See Stella (1997).

That is, were the central bank to arrive at a situation where its policy decisions were being impacted by its financial condition, the treasury would, could, or should always assist.

Goodhart (1999) outlines the view that the central bank balance sheet does not matter and it is noteworthy that—in a fiat money environment—he emphasizes the importance of the financial backing of the state to achieve central bank objectives, not the ability of the state to renege on its commitments. “CBs in some countries, mainly in Latin America, have actually become technically insolvent (using generally accepted accounting principles) as a result of losses incurred on loans in support of the domestic financial system. But such insolvency does not make much difference because what stands behind the liabilities of the CB is not the capital of the CB but the strength and taxing power of the State.”²⁴

Buiter states this view even more forcefully. “The concept of a financially independent central bank is therefore, in substance, vacuous, whatever the formal legal status of the central bank. First the inflation target has to be financable by the state, that is, the consolidated central bank and government. Second, when monetary policy is institutionally delegated to the central bank, the treasury has to ‘stand behind’ the central bank.”²⁵

However, for a number of countries, this is not a valid assumption and such a distinction between monetary regimes—there are those where the state explicitly or implicitly stands behind the central bank and those where it does not—is the essential starting point for the analysis in Sims (2003a). The following two sections of this paper discuss the international experience on this point from first a legal then empirical/historical perspective.

C. A Digression: Are Central Bank Finances of Macroeconomic Importance?

In discussing the financial situation of the Federal Reserve System, the Bank of Canada or the European Central Bank, the magnitudes would seem worthy of no more than a footnote to the general fiscal accounts. Fed profits average about ¼ of one percent of GDP and the profits/losses of the European Central Bank, during its brief existence, have remained less than 0.03 percent of Euro-area GDP in absolute value. Threats to central bank financial independence could well seem extremely speculative in many countries. Within a “reasonable” range of observed situations in mature industrial country central banks, the disturbances to the local equilibrium wherein resides central bank financial strength are hardly enough to lead anyone to question whether they will impact policy objectives.

If the Federal Reserve or the European Central Bank were to experience minor perturbations in the strength of their balance sheets, fiat money could cover them either immediately or through the retention of future seignorage. But it is dangerous to extrapolate too far from the local equilibrium when experience is no guide.

²⁴ Charles A. E. Goodhart, *Myths about the Lender of Last Resort*, International Finance 2:3, 1999, page 348).

²⁵ *How Robust is the New Conventional Wisdom in Monetary Policy?* Willem H. Buiter, paper presented at the 2006 Central Bank Governors’ Symposium ‘Challenges to Monetary Theory’, (Bank of England) June 23.

Goodfriend (1994) has noted that Congress does have the power to reduce Fed surplus and that “If carried far enough, stripping the Fed of its liquid assets would obviously interfere with its ability to conduct monetary and credit policy. Equally important, however, it would undermine the Fed’s financial independence by denying it enough interest income to finance its operations without having to ask Congress for appropriations or resorting to inflationary money creation.”²⁶

The financial status of the Bank of Japan has been the subject of rather intense debate in recent years particular owing to the balance sheet risk it has undertaken as part of its quantitative easing policy associated with prolonged deflation. In Latin America, Asia, Africa, and in Eastern and Central Europe, central banks have found themselves in considerable financial distress, usually owing to the delayed impact of quasi-fiscal operations—often in direct relation to the provision of credit in situations of a systemic banking crisis.

The prolonged impact of such operations in certain countries can be seen in Table 1 below.

Table 2. Central Bank Losses in a Group of Western Hemisphere Countries, 1987-2005
(In percent of GDP)

Country	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Argentina	-0.7	-0.5	-4.5	-0.7	-0.4	-0.1	0.4	0.2	0.2	0.3	0.3	0.3	0.2	0.3	-0.1	...	...	...	...
Bolivia	...	-0.2	-0.4	-0.7	-0.7	-0.2	0.4	0.7	0.9	0.6	0.7	0.7	0.4	0.5	0.5	0.5	0.2	0.3	0.3 *
Chile	-3.1	-3.2	-1.8	-2.2	-1.1	-1.2	-1.0	-0.9	-0.6	-0.7	-1.1	-1.1	-1.1	-1.4	-1.0	-1.2	-0.7	-0.8	-0.5
Costa Rica	-3.5	-3.3	-2.8	-2.0	-1.9	-2	-1.5	-1.4	-1.9	-2.1	-1.8	-1.6	-1.6	-1.8	-1.2	-1.4	-1.6	-1.3	-1.4 *
Dominican Republic	-1.0	-1.5	-0.8	-0.6	0.0	-0.6	-0.1	-0.6	-0.5	-0.6	-0.7	-0.5	-0.4	-0.3	-0.2	-0.3	-2.6	-4.0	-2.9
Ecuador	...	-2.2	-2.5	-2.9	-2.3	-1.0	0.1	0.6	0.0	0.2	0.1	0.3	-1.2	0.6	...	...	...	...	...
Guatemala	-1.6	-1.9	-1.5	-2.4	-1.6	-1.2	-1.1	-1.3	-1.0	-1.2	-0.8	-0.3	-0.3	-0.4	-0.8	-0.6	-0.5	-0.6	-0.5 ¹
Haiti	...	...	...	...	...	...	...	...	...	...	...	0.1	0.0	-0.2	-0.2	-0.3	-0.6	-1.0	...
Honduras	...	...	...	-3.2	-2.5	-2.7	-0.5	-1.3	-1.9	-1.6	-1.6	-0.1	-0.2	0.0	-0.4	-0.9	-1.1	-1.1	-1.0 *
Jamaica ²	-5.7	-5.4	-5.4	-5.0	-4.3	-5.6	-4.7	-1.8	-2.0	0.6	1.0	-0.3	0.0	0.3	-0.5	-1.7	-1.7	-1.0	-1.5
Nicaragua	-5.0	-8.0	-13.8	-2.8	-0.7	-1.1	-1.4	-0.6	0.1	-0.2	-0.6	-3.3	-1.7	-1.6	-1.3	-2.0	-1.6	-1.4	...
Paraguay	0.2	0.2	0.1	0.6	0.8	0.5	0.1	0.0	-3.8	-1.5	-1.8	-0.6	-0.8	-0.4	-1.3	-1.4	-1.1	-0.8	-0.2 *
Peru	-5.4	-3.2	-0.4	-1.1	-0.4	-0.2	-0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.0	-0.1 *
Uruguay	-2.8	-3.1	-3.4	-3.6	-2.2	-1.6	-0.8	-0.6	-0.6	-0.5	-0.5	-0.5	-0.2	-0.4	-0.3	-0.3	0.0	-0.6	...
Venezuela	-1.4	-2.9	-1.8	-2.0	-1.7	0.0	-0.2	-2.0	-1.0	-0.7	-0.6	-0.8	-0.5	0.3	0.1	0.1	0.8	1.6	...
Mean	-2.7	-2.7	-3.0	-2.0	-1.4	-1.2	-0.7	-0.6	-0.9	-0.5	-0.5	-0.5	-0.5	-0.3	-0.5	-0.7	-0.8	-0.8	-1.0
Median	-2.8	-2.9	-1.8	-2.1	-1.4	-1.1	-0.4	-0.6	-0.6	-0.6	-0.6	-0.3	-0.3	-0.2	-0.4	-0.6	-0.7	-0.8	-0.8

Sources: Leone (1994), IMF staff reports, Central Bank of Argentina, Central Bank of Guatemala, Central Bank of Paraguay, Central Bank of Uruguay, Central Bank of Venezuela

* Preliminary

¹ IMF staff estimate

² For years after 2002, only includes Bank of Jamaica (BoJ) cash losses, excluding BoJ Special Issue Bond

In Uruguay, central bank losses averaged 3 percent of GDP in the late 1980s. The central banks of Chile and Guatemala have made losses for close to two decades consecutively. Venezuela made losses for 12 out of 13 consecutive years, Uruguay made losses for 14 consecutive years, Jamaica 9.

²⁶ *Journal of Money, Credit and Banking*, vol. 26, No. 3 (August 1994, part 2).

Where this question has its most practical application is in a situation when, to borrow from Buiters' terminology, in the midst of a banking crisis the central bank with its "*short-term deep pockets*" provides risk-laden credit and thereafter hopes to be recapitalized by "The treasury, the agency of the state with the capacity to tax [with] *long-term deep pockets*."²⁷ This effect can be seen in a number of countries during the 1980s and subsequent spikes in the data more recently—for example, the Dominican Republic in 2003–05.²⁸

From a theoretical perspective Sims (2003a) notes that in general equilibrium models—“..uniqueness and stability of the price level depends on beliefs of the public about how the system would react in the face of extreme circumstances like very high inflation, severe financial instability, or deflations in which the zero lower bound on nominal interest rates is approached.”²⁹ That is, under stress, the expectations of the public as to how the central bank will respond to an extreme deterioration in its financial position will determine the effectiveness of macroeconomic stabilization efforts.³⁰

In reality, many countries have found themselves in “extreme circumstances” and their experience suggests that neither the Fed nor the ECB situations are representative of the issues facing a number of developing or emerging market central banks on a daily basis.

In the Dominican Republic, following efforts to contain the liquidity expansion following the recent banking crisis, central bank domestic debt amounts to 22 times central government domestic debt. In Costa Rica, the central bank has made losses for over two decades consecutively as the structure of the balance sheet reveals a huge imbalance among interest bearing liabilities and interest earning assets.³¹ Periodic partial recapitalizations have not been sufficient to reverse the overall trend.

The negative equity problem of the Central Bank of Chile can be traced back to the financial crisis of 1982 the cost of which has been estimated at 33 percent of GDP. Initially the cost was borne entirely by the central bank but in 1987 the government made a partial recapitalization. This issue was not faced again until 2006 when the Congress approved a transfer of up to 0.5 percent of GDP per annum for a period of 5 years. The central bank has estimated that this capital infusion would advance the date at which it would have positive equity from 2041 to 2026, that is, by fifteen years. The central bank received US\$606 million as the first part of this partial recapitalization on December 27, 2006.

²⁷ Buiters (2006) “How Robust is the New Conventional Wisdom in Monetary Policy?” Page 44.

²⁸ Unfortunately, obscure accounting treatments have often led to a delayed recognition of losses. See Stella (2002).

²⁹ Sims (2003a) Fiscal Aspects of Central Bank Independence, page 3.

³⁰ See JPMorgan. *Japan Markets Outlook and Strategy*, January 24, 2002.

³¹ See Ize (2005).

In Honduras and Nicaragua the ratios of central bank domestic debt to central government domestic debt are 2.4, and 1.4, respectively. During a one year period—August 2000 to 2001—the Central Bank of Nicaragua issued 20 percent of GDP in dollar-indexed domestic debt to resolve four bank failures. These bonds subsequently had to be restructured in an agreement with the private sector holders. Monetary stabilization bonds account for 57 percent of the liabilities of the Central Bank of Korea (end-2005); Bank Indonesia certificates 19 percent, and Bank of Jamaica certificates of deposit 61 percent.

In a number of countries it can safely be said that the central bank is both the manager and obligor of the sovereign's domestic debt. In those cases the conflict of interest that is usually present between the government and central bank—raising interest rates to influence inflation leads to higher sovereign debt service cost (at least in the short run)—is observed within a single institution.

The central bank as debt issuer raises governance problems. In particular, while government debt issues are usually subject to legislative approval, debt issues by central banks may not be so constrained.³² Here the implicit nature of government backing may allow the central bank to issue in its own name under the general securities law of the country. Operational links with banks—frequently the largest holder of domestic government debt—facilitate marketing and establishing the infrastructure (if no market already exists) as well as potentially compounds the governance issue. Furthermore, in many countries that have witnessed a sharp rise in domestic debt it has been precisely the provision of large amounts of central bank securities to an insolvent banking system which has enabled the rapid but often illusory “deepening” of the market. The banking system—which may also be regulated by the central bank—then becomes dependent for its survival on the full and timely service by the central bank of their largest single performing asset.

These are a few examples of central banks who have been constrained in their operations following what might be classified as a heavy engagement in quasi-fiscal operations. The fact that such operations usually take place in the context of government fiscal distress suggests why it is particularly innocent to assume that government will “stand behind” the central bank in a timely way to ensure that policy commitments are met. The power to tax, often cited as the ultimate guarantor of the currency, is unlikely to be employed precisely during those extreme circumstances when the central bank would require backing for its operations. Indeed, it is precisely during those circumstances that the inflation tax is seen as an efficient tool and price stability a dispensable luxury. Experiences worldwide suggest that Buiter's treasury's “deep long pockets” may be quite deep and in the end—or at least during a very material time frame—potentially empty.

³² Sims (1999) discusses the interesting case of Grover Cleveland's issuance of debt for essentially monetary policy purposes without consulting Congress.

III. LEGAL PROVISIONS

A. Explicit Recognition of Responsibilities

The first issue to be considered here is whether in legislation pertaining to the central bank there are provisions noting whether the government is in some sense responsible for the central bank's financial liabilities and vice versa. We examine this in two ways. First, among the general provisions in the legislation treating relations with the fiscal authorities, second in those sections of the law that deal with the financial structure of the central bank and how capital deficiencies would be resolved. The findings, based on a review of 135 central bank laws, are summarized in Appendix 1 Table A below.

Appendix 1 shows that there is a diversity of legal views world wide with, in particular, a diametrically opposed bi-model distribution. Examples supporting the views expressed by Greenspan, Lindsey, Goodhart and Buiter, which suggest that the treasury stands behind the central bank include El Salvador: "All the obligations of the Central Reserve Bank of El Salvador shall be assumed by the State through the Ministry of Finance, which may offset them against obligations existing in its favor."³³ Croatia is a second example, "obligations of the Croatian National Bank shall be guaranteed by the Republic of Croatia." The charter of the Central Bank of Argentina states that "The National State guarantees any liabilities undertaken by the Bank." The Act on the Central Bank of Iceland states that "All obligations of the Central Bank are guaranteed by the State Treasury."

A very different sentiment is expressed in a number of countries where the law explicitly states that, in general, the central bank is not responsible for the liabilities of the state and the state is not responsible for the liabilities of the central bank. One interesting commonality in this respect can be perceived in a number of the laws in the countries comprising Estonia, Latvia, Lithuania, Russia and other states of the former Soviet Union. This could be the result of the fact that most of the laws date from a similar era when this was deemed to be an important feature of central bank independence; the particular political and economic realities shared by those countries at the time; or a peculiarity of the distribution of state assets and liabilities following the dissolution of the Soviet Union.

If one takes, for example, the Law on the Bank of Lithuania, it stands in stark contrast with the notion that the government stands behind the central bank and vice versa. "The State of Lithuania shall not be liable for the obligations of the Bank of Lithuania, and the Bank of Lithuania shall not be liable for the obligations of the State of Lithuania." Similarly, the law on the National Bank of Tajikistan: "The Republic of Tajikistan shall not be liable for the obligations of the National Bank of Tajikistan, except for those assumed with consent of the Madjlisi Oli of the Republic of Tajikistan or the President of the Republic of Tajikistan."

³³ This provision dates from the era prior to the full dollarization of the Salvadorian economy and the elimination of the national currency.

Although most central bank laws are not explicit on this issue, the review summarized above and provided in Appendix 1 shows that it cannot be assumed that the state is legally responsible for the central bank's obligations which suggests that the latter's independent financial strength is a consideration when considering its ability to fulfill its mandate.

B. Coping with Central Bank Losses or Capital Insufficiency

Indirect responsibility for central bank liabilities can be inferred from provisions in the central bank law governing how central bank losses or capital insufficiency would be addressed. Many central bank laws have such provisions although the procedures are defined with different levels of specificity.

Some countries have general clauses, such as Kuwait "If the General Reserve Fund, in any years, is insufficient to meet the losses of the Bank, or if it can not be used to meet the losses, the Government shall cover the deficit." A slightly more specific phrase can be found in the Bank of Korea Act: "Any loss incurred by the Bank of Korea during any fiscal year shall be offset from the reserves and, should these be insufficient, the deficiency shall be made-up by the Government in accordance with the Budget and Accounts Act."

The Bank of Korea Act points to the potential issue of requiring further legislative approval for a recapitalization, for instance through the annual budgetary process. Some country laws specify that further approval is not necessary and hence appear to be closer to "automatic" recapitalization. Take the Central Bank of Kenya Act: "The amount of any net losses of the Bank in any financial year which is in excess of the sums standing to the credit of the general reserve fund of the Bank shall be charged upon and paid out of the Consolidated Fund without further appropriation than this Act."

The Reserve Bank of New Zealand Act specifies particular losses that are to be covered by Government reflecting the particular agency arrangement the latter has with the former regarding the management of the country's foreign exchange reserves: "The Minister shall, without further appropriation, pay to the Bank out of the Crown Bank Account the amount of any exchange losses (whether realized or unrealized) incurred by the Bank as a result of dealing in foreign exchange under sections 17 and 18 of this Act".

How the losses are covered can be as important as when. Some central bank laws specify the type of transfer that is to be received. In Cape Verde: "If the Bank incurs a net loss...[it] shall be applied to the General Reserves, and if the latter should prove insufficient...the balance of the loss should be transferred to inappropriate earnings; After the submission, by the Bank, of a report...confirming the balance of the cumulative losses, the Government shall deliver to the Bank, within a maximum period of 60 days, funds, negotiable instruments that are dated and on market-determined terms and conditions and at market-determined exchange rates, in the amount or amounts necessary to make up the deficit."

In other countries the law specifically calls for the provision of securities of a very different and/or more ambiguous nature. In Fiji "The Minister...shall cause to be transferred to the ownership of the Reserve Bank non-negotiable non-interest bearing securities issued by the Government ...for the purpose of preserving the paid-up capital from any impairment..." In

Malawi, “...any devaluation losses shall be covered by promissory notes of the government on such terms and conditions as shall be agreed upon between the Minister and the Bank.” The Bank of Namibia Act calls for revaluation losses to be covered by “...non-negotiable securities to the extent of the deficiency, on such terms and conditions as the Minister and the Board may agree upon.” The Central Banking Act in Papua New Guinea states that the Minister may create and issue to the Central Bank “non-interest bearing non-negotiable notes for an amount not exceeding any payment made by the Minister to the Central Bank out of the Consolidated Revenue Fund.”

In some cases the securities are to be serviced out of future central bank profits, such as United Arab Emirates “...the Government shall cover it [net debit balance] by issuing non-interest bearing, negotiable Treasury Bonds, which shall in turn be returned out of any net profits realized in subsequent years.” In Rwanda “...the Government will issue Treasury Bills not negotiable and non interest-bearing, for an amount equivalent to the debit balance of revaluation account. These Treasury Bills will be refundable by deduction from the Government share of Bank profits according to a schedule agreed upon with the Minister having finances under their competency.”

IV. DO TREASURIES ACTUALLY STAND BEHIND CENTRAL BANKS?

The basic answer to this question is frequently no, at least not on a timely basis.

Examples of this phenomenon abound with the motivations/rationales falling into several different categories. One is that some states simply do not fulfill their legal obligations. Jácome and Parrado (2007) note that “In practice, this legal mandate has not materialized in the Dominican Republic and Nicaragua...”³⁴

A second reason is that although the law might provide in general terms for the necessity of a recapitalization, the actual transfer of resources from the treasury would usually require legislative approval. That is, as most countries require legislative approval to spend public funds, a general commitment to maintain the capital of a public enterprise cannot override a requirement that the legislature specifically authorize such an expenditure prior to its occurrence.

In some laws, this notion is recognized explicitly, e.g., in Guatemala the central bank law calls for the Minister of Finance to submit, within the subsequent year’s budget request, the amount necessary to recapitalize the central bank.³⁵ It does not, and seemingly could not,

³⁴ *The Quest for Price Stability in Central America and the Dominican Republic*, Luis I. Jácome and Eric Parrado, IMF Working Paper, WP/07/54, page 6.

³⁵ This replaced Article 83 of the old Central Bank of Guatemala law which required that the State, through the Ministry of Finance, shall absorb the accumulated cost of monetary, exchange rate and credit policies through the emission of long term public debt with an interest rate of zero (author’s translation).

mandate a future congress to authorize that expenditure whatever the amount, whenever it occurs and for whatever the reason.

Third, as suggested by the review of law in section III, central banks have frequently been “recapitalized” with treasury obligations with virtually no value. The Central Bank of Honduras (BCH) has been “capitalized” three times with nonremunerated long-term debt.³⁶

At its founding, in 1950 the BCH received a 50 year non-remunerated government bond to cover its newly mandated monetary liabilities to the extent that these exceeded the assets of the monetary board that it replaced. Interestingly the government never used its own resources to redeem the bond. The 1996 amendments to the central bank law required the central bank to redeem the bond out of its own reserves. In 1997, the BCH received another 50 year non-remunerated bond to cover its accumulated losses as of end-1996. The nominal value was 5.4 billion lempira, equivalent to 1.1 percent of 1996 GDP. However, valuing a payment of 5.4 billion lempira to be received in 2047 at 1997 prices using as a discount rate the average return on Honduran government bonds during the period 1997–2003 yields a value of 0.0006 percent of GDP. In 2005, the BCH received a third non-remunerated 50-year bond, with 25 years grace, to cover losses accumulated during the years 1997–2003.

A not infrequent technique is to provide the central bank with a security the debt service on which is to be paid out of the central bank’s own retained earnings. Taking this security at an arbitrary par value may allow the treasury to meet its obligation under the law but provides neither an asset under IFRS nor any positive cash flow in the immediate future.³⁷

Central banks highly exposed to foreign exchange fluctuations are particularly prone to decapitalization from a mechanical asymmetric profit transfer rule. Profit transfers in years with significant revaluation gains are not balanced by years in which large revaluation losses are suffered since there is no provision for treasury coverage in that eventuality. Considerations such as these recently led the Netherlands to amend the central bank dividend policy.

Legal provisions determining when and how profits are transferred to the treasury can be exceptionally important. In this respect most central banks pay a mechanical proportion of profit to the treasury on an annual basis. Many laws are silent as to how to treat losses, leaving the central bank prone to decapitalization. There are no recognized standards for central bank capital, nor is the Basel risk-weighted asset to capital ratio applied.³⁸

³⁶ See Stella (2007), *Varieties of central bank recapitalization experience*, IMF Working Paper, forthcoming.

³⁷ There is an imbedded option value similar to that with tax losses carried forward.

³⁸ The Fed is extremely unusual in that it calculates and transfers to the U.S. Treasury profits on a weekly basis. Owing to revaluation losses on its admittedly small foreign reserve holdings, it has registered a loss (for a week) occasionally.

How can central banks run consistent losses but continue to show positive capital? It is quite common in central bank laws to have a mandated nominal capital for the central bank. In addition to this statutory capital it is also customary to have a reserve account(s). Equity would normally be considered to be the sum of capital and reserves. Most commonly, reserves are accumulated from retained earnings. If we presume that reserves cannot go below zero as a lower bound, there are three basic ways in which central banks can sustain losses in excess of equity yet continue to show positive capital.

The first point to recognize is that most central banks have not fully implemented IFRS, in particular fair market valuation of assets. Thus the accounting system may allow the non recognition of losses through the use of historical cost of acquisition for valuation. This practice was widespread also in commercial banking before recent changes in worldwide accounting best practice. For central banks, the original motive was consistent with a desire not to distribute unrealized gains on assets to the government as that is akin to monetary financing. A number of central banks continue to account for gold at cost of acquisition.

The second method is the use of revaluation or adjustment accounts which do not impact equity. This accounting can either be mandated in law or be permitted by the accounting policies followed by the bank. A number of countries utilize such revaluation accounts which were originally conceived as protecting the central bank from being forced to distribute unrealized gains. This is a variant of the first principle—one recognizes the revaluation but does not take it into the profit and loss account. Hence large changes in real net worth are reflected in the asset or liability revaluation accounts but do not impact equity.

Sometimes the motivation for this treatment is out of a commitment to the law. If the law states that capital must be a certain nominal figure, it could be deemed illegal to for the Board or chief accountant to adjust this figure. The only way to make the balance sheet balance is then to take the accumulated losses on to the asset side of the balance sheet. (Rather than lowering capital, a liability, below the legal minimum one creates instead an “asset” of rather dubious value).³⁹ Sometimes this asset is noted on the balance sheet as a claim on government—regardless of whether the government recognizes it at such. Obviously the central bank is not in a position to dictate terms on such an asset and invariably it is not serviced on time and in full by government. In other cases, there may be a legal remedy for the central bank that establishes its claim on government for accumulated losses and eventually the bank is provided real assets as part of a recapitalization at some distant point in the future.

One example of the use of revaluation accounts was the National Bank of Hungary (NBH) before its recapitalization. Revaluation losses by end-1995 had reached 37 percent of central

³⁹ At the Central Bank of Ecuador such assets were known in the 1990s as “perdidas activadas” which translates roughly as “assetized losses.”

bank assets, far in excess of capital (see Table 2).⁴⁰ Despite these large revaluation losses the NBH continued to transfer profit to the Ministry of Finance.⁴¹

Table 2. Hungary. Central Bank Balance Sheet as of December 31, 1995
(in billions of forints)

ASSETS		LIABILITIES	
Foreign exchange	1,805	2,906	Non-resident deposits and other liabilities
Credit to government	1,130	1,466	Resident deposits
Credit to financial institutions, other credit and specific provisions	287	482	Banknotes and coins
Revaluation losses	2,033	182	IMF claims
Other assets	166	152	Blocked foreign exchange deposits of government
		177	Other liabilities
		55	Balance sheet profit, authorized capital and provisions
Total	5,421	5,421	

Source: National Bank of Hungary Annual Report 1995, Statistical Annex, pages 224–25.

V. CAN CENTRAL BANK FINANCIAL INDEPENDENCE BE PRESERVED?

In many cases the exposure of the central bank to losses comes primarily from its role in putting its capital at risk by intervening in a systemic crisis to provide liquidity to financial institutions and/or their depositors and other creditors.⁴² Whether central banks should do so is another matter and indeed there are good reasons for central banks to avoid this and other “quasi-fiscal” activities.⁴³ Given that government financial responsibility for such operations is often slow to be assumed, outright prohibition of them may be the best course of action to preserve independence. This has led some countries to restrict or limit the central bank’s ability to be involved in such operations. For example, the central bank law enacted in Peru in 1992 expressly prohibited the activities that had been associated with the hyperinflation of the late 1980s.

In the case of Peru just described, and in others, changes in legal arrangements reflected broader political changes and those, of course, could be reversed. However, presuming an underlying consensus for independence, legislatures may enable central bank independence

⁴⁰ In South Africa (2003) and Peru (1988), similar accounts reached 28 percent and 25 percent of total central bank assets, respectively.

⁴¹ See NBH Annual Report 1995, Section V, “Resolutions by the General Meeting.”

⁴² Apart from explicit liquidity intervention in crisis situations, many central banks hold significant off-balance sheet contingent liabilities in the form of daylight overdrafts in the inter-bank payments system.

⁴³ MacKenzie and Stella (1996).

for a reasonable period of time, for example three to five years, under most reasonable circumstances. Broaddus and Goodfriend (1996)⁴⁴ discuss the U.S.: “Congress has long recognized, however, that the pressure of budgetary politics could tempt future Congresses to press the Fed at least implicitly to help finance federal expenditures through inflationary monetary policy. Consequently, the Fed has been made financially independent—its operations are funded from the interest payments on its portfolio of securities—and the Fed has wide discretion over the assets it holds.”

The current financial structure of the Fed thus obviates the need to be overly concerned about its financial strength or with provisions to ensure it beyond the Treasury guarantee of Federal Reserve Notes. The U.S. does, however, explicitly recognize contingent liabilities to other financial institutions. One example of this is the capital obligation of the U.S. to the International Bank for Reconstruction and Development, commonly known as the World Bank.

The World Bank has both paid in and callable capital but most lending is financed with funds borrowed in international capital markets. Should the Bank be unable to cover credit losses with its capital and retained earnings, members are committed to pay in further capital to avoid a default on outstanding Bank bonds. “Over and above the \$2 billion in capital that the United States has already paid in, the country has agreed to pay in another \$30 billion in callable capital should such an event materialize....The Congress has appropriated about \$7.4 billion for that purpose, so the Treasury could provide up to that amount without additional Congressional action.”⁴⁵

While the prospect of the U.S. being required to provide more than \$7.4 billion in callable capital to the World Bank is quite improbable, the U.S. approach bears a resemblance to that discussed above in the cases of the Reserve Bank of New Zealand and the Bank of Kenya—a legislatively delegated budgetary authorization for central bank recapitalization.

With these examples in mind we might posit three “stages” or “layers” of central bank financial independence. The first being capital on hand, that is, the current strength of the balance sheet represented by equity properly valued. The central bank could exhaust this equity without any outside involvement.

⁴⁴ J. Alfred Broaddus, Jr., and Marvin Goodfriend “Foreign Exchange Operations and the Federal Reserve,” Federal Reserve Bank of Richmond Economic Quarterly Volume 82/1 Winter 1996.

⁴⁵ *The Costs and Budgetary Treatment of Multilateral Financial Institutions’ Activities*, statement of Douglas Holtz-Eakin, Director, Congressional Budget Office, before the Committee on Banking, Housing, and Urban Affairs, United States Senate, May 19, 2004.

The second would be a legislatively pre-authorized transfer of liquid funds to cover specified losses or a general remedy for capital deficiency. To activate this stage would require a technical decision or judgment by the treasury, but not an act of the legislature.

A third stage would be a specific legislative commitment—without pre-authorized budgetary authority—to cover a larger capital deficiency. To activate this stage would require both treasury consent and budgetary approval by the legislature (in the form of a budgetary appropriation).

The U.S. and Canada are cases where the strength of the central bank balance sheet eliminates the need for explicit consideration of stages 2 and 3. Many countries have a stage 3 solution in place, but, to the authors' knowledge, only New Zealand and Kenyan legislation have elements of stage 2. What some countries do have, however, either formally or informally, is a mechanism to suspend profit transfers when the balance sheet is in some sense deemed inadequate, e.g., equity is negative. In others, the profit transfer is negotiated or agreed with the Ministry of Finance depending both on the central bank's and Ministry's financial need at the time.

The problem with implementing these solutions is that there is no agreed technical trigger indicating central bank capital inadequacy—nor can there be. As the real issue is not technical insolvency but policy solvency and its credibility, the appropriate degree of central bank financial strength is both policy-dependent and a political issue. However, once an appropriate level or range in a given country, at a given time, is determined, institutional design can play an important role in preserving it.

VI. CURRENT PRACTICES IN SIGNING BANKNOTES—A SUMMARY

Most banknotes bear signatures, with the vast majority of the signatures being those of central bank officials (see Table 3). Of the 184 IMF member states at the end of 2005, seven—Ecuador, El Salvador, Marshall Islands, Micronesia, Palau, Panama, and Timor-Leste—use the currency issued by another country, namely the U.S. Of the remaining 177 cases, in 119 the only signatures on the banknotes are of central bank officials. The second most frequent occurrence (32 cases) is a mixture of central bank and ministry of finance/treasury officials.

It is extremely rare for the banknotes to be signed by only treasury officials, with the U.S. (two signatures), Bhutan, Samoa, and Singapore being the only current cases. The U.S. practice is reflected in the strong legal obligation of the Treasury for both its own banknotes and those of the Federal Reserve. As the U.S. Treasury states on its website: “The Federal Reserve Act of 1913 authorized the production and circulation of Federal Reserve notes. Although the Bureau of Engraving and Printing (BEP) prints these notes, they move

into circulation through the Federal Reserve System. They are obligations of both the Federal Reserve System and the United States Government.”

Table 3. Summary—Who Signs Banknotes?
December 2005

	Number of Countries
<u>Banknotes with no signature(s)</u>	10
of which:	
banknotes with no signature(s) but with seal(s)	3
banknotes with no signature(s) and no seal(s)	7
<u>Banknotes with signature(s)</u>	167
of which:	
central bank official(s) only ^{1/}	119
central bank official(s) and ministry of finance (treasury) official(s)	32
central bank official(s) and other	8
ministry of finance (treasury) official(s) only	4
ministry of finance (treasury) official(s) and other	1
other only	3
<u>Total</u>	<u>177</u>

1/ The following countries have two signatures from central bank officials: Angola, Burundi, Canada, Denmark, Finland, the Gambia, Indonesia, Lebanon, Mauritius, Rwanda, Sierra Leone, Tunisia, Turkey, and Venezuela.

Sources: Tables 6–8 below.

Among the more unusual signature combinations can be noted that eight countries—Argentina, Eritrea, Estonia, Israel, Morocco, Philippines, Sweden, and Tajikistan—have a signature by a central bank official with an other (non-ministry of finance) person. Tonga is the only country with the combination of a signature by a ministry of finance official and other (non-ministry of finance) person. Three countries—Bahrain, Brunei, and Oman—have each one signature by one other person who is neither an official of a central bank nor of a ministry of finance/treasury.

Euro banknotes bear only the signature of the President of the European Central Bank. Table 4 and Table 5 provide information on the variety of signatures on the banknotes previously issued by the countries in the European Union as of end-2001. The adoption of the euro by twelve of those countries resulted in the elimination of two treasury signatures from the banknotes circulating there.

Table 4. Signatures on Issued Banknotes in European Union Countries, December 2001

	Number of Signatures on Banknotes	Chairman of the Board of the Central Bank	Governor of the Central Bank	Deputy Governor of the Central Bank	Other Officials of the Central Bank	Officials of the Ministry of Finance	Other
<u>Countries in the EMU</u>							
of which:							
Austria	3	-	1	-	2	-	-
Belgium ⁴⁶	2	-	1	-	1	-	-
Finland	2	1	1	-	-	-	-
France	3	-	-	-	3	-	-
Germany	2	-	1	1	-	-	-
Greece	2	-	1	-	1	-	-
Ireland	2	-	1	-	-	1	-
Italy	2	-	1	-	1	-	-
Luxembourg	2	-	1	-	-	1	-
The Netherlands	2	-	1	-	1	-	-
Portugal	2	-	1	-	1	-	-
Spain	2	-	1	-	1	-	-
<u>Countries outside the EMU</u>							
of which:							
Denmark	2	-	1	-	1	-	-
Sweden	2	1	1	-	-	-	-
U.K.	1	-	-	-	1	-	-

Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.; MRI Bankers' Guide to Foreign Currency, 57th ed.

⁴⁶ During 1964–66, “treasury notes” were issued in Belgium in parallel with banknotes from the central bank..

Table 5. Positions of the Signers of Banknotes in European Union Countries, December 2001

	Number of Signatures on Banknotes	Explicit Positions of Signers of Banknotes or <i>Implicit Positions of Signers of Banknotes</i>		
<u>Countries in the EMU</u>				
of which:				
Austria	3	Generalrat	President	Generaldirektor
Belgium	2	Le Trésorier	Le Gouverneur	-
Finland	2	<i>Chairman of the board of the central bank</i>	<i>Governor</i>	-
France	3	Le Secrétaire Général	Le Controleur Général	Le Caissier Général
Germany	2	<i>Governor</i>	<i>Deputy Governor</i>	-
Greece	2	Governor	Director	-
Ireland	2	Governor	Secretary General of the Department of Finance	-
Italy	2	Il Governatore	Il Cassiere	-
Luxembourg	2	<i>Director-General of the LMI</i>	<i>Minister of Treasury</i>	-
The Netherlands	2	President	Secretaris	-
Portugal	2	O Governador	O Administrador	-
Spain	2	El Gobernador	El Cajero	-
<u>Countries outside the EMU</u>				
of which:				
Denmark	2	<i>Governor</i>	<i>Head of Banking Services</i>	-
Sweden	2	<i>Chairman of the board of the central bank</i>	<i>Governor</i>	-
U.K.	1	Chief Cashier	-	-

Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.; MRI Bankers' Guide to Foreign Currency, 57th ed.

VII. WHY ARE BANKNOTES SIGNED?

In the past, many countries required that all issued banknotes be hand signed by at least one person. This requirement was based on a tradition that preceded the existence of banknotes, when the equivalent of paper money was created by producing a formal document that (i) specified certain financial obligations between two parties; (ii) allowed the transfer of the document with the financial obligation to a third party; and (iii) was signed (and sometimes sealed). Thus, the obligation became legally binding.

In addition to following this tradition with its legal implications, signatures on banknotes—zero-interest promissory notes payable on demand—could be seen as an anti-counterfeiting device. This was also a means to restrict the quantity of banknotes issued, since there was a physical limitation regarding how many banknotes could be signed by one or more persons.

Today, almost all banknotes are printed with one or more signatures. The most important exceptions to this tradition are Chinese, Japanese, and Korean banknotes. Instead of signatures, they use printed seals typically reading “the seal of the Governor.”⁴⁷ Furthermore, banknotes from seven countries lack both signatures and seals.⁴⁸

A. Study on Signatures on Banknotes

For the purposes of this paper, a study was undertaken on the use of signatures on the banknotes issued by the member states of the IMF, reflecting the situation at the end of 2005. Accordingly, the banknotes of 184 states were analyzed. Operationally, the selection of banknotes was limited to the legally circulating banknotes within the most recently issued “family” of banknotes.

Principally five sources were used for the study:

- Standard Catalog of World Paper Money, Vol. 3, 12th ed., Krause Publications, 2006; a major numismatic reference book, covering modern banknote issues since 1961;
- MRI Bankers’ Guide to Foreign Currency, 57th ed., Monetary Research Institute, Houston Texas, 2005–06; a compilation used by banks and foreign exchange bureaus to identify foreign banknotes to establish whether they continue to be legal tender;
- Material prepared by Thomas De La Rue Currency and other major international banknote printing firms;
- “The Colorful World of Money;” a CD Rom with 1,500 world banknote scans; and
- Central Bank Legislation Database (as of December 2005)—a data base maintained by the Central Banking Division of the Monetary and Capital Markets Department of the IMF.

⁴⁷ These are sometimes called “stamps” or “chops.” Contemporary Chinese banknotes use one square seal on the reverse side of the banknote, Japanese banknotes have one round seal printed on both the obverse and reverse sides, while Korean banknotes use one round seal on the obverse side only.

⁴⁸ Azerbaijan, Belarus, Laos, Myanmar, Russia, Uzbekistan, and Vietnam.

B. Who Issues Paper Currency?

Before discussing the specificity of who signs banknotes, this paper first examines the issue of identifying the authority that was in charge of issuing banknotes. The key categories are: (i) the state's own central bank; (ii) use of another country's central bank for countries not issuing specific currencies of their own; (iii) a multilateral central bank for countries that are part of a currency union; and (iv) a non-central bank authority.

Table 6 contains information on which types of authorities issue banknotes. The data are subdivided into (i) the geographical distribution according to the region used by the IMF; and (ii) the distribution by income according to the World Development Indicators Income Classification as prepared by the World Bank.⁴⁹

Table 6. Authorities Issuing Banknotes, December 2005

	Own Central Bank	Other Country's Central Bank	Multilateral Central Bank	Other Authority	Total IMF Member States
<u>Distribution by IMF Region</u>	143	7	33	1	184
of which:					
Africa	31	-	14	-	45
Asia and Pacific	30	4	-	-	34
Europe	29	-	13	-	42
Middle East and Central Asia	29	-	-	-	29
Western Hemisphere	24	3	6	1	34
<u>Countries by Income Level</u>	143	7	33	1	184
of which:					
High-income	21	-	13	1	35
Upper middle-income	29	2	8	-	39
Lower middle-income	48	5	-	-	53
Low-income	45	-	12	-	57

Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.; MRI Bankers' Guide to Foreign Currency, 57th ed.

The main conclusions that can be drawn from Table 6 are:

- In about three quarters of all IMF member states, the national central banks issued banknotes. In the Middle East and Central Asia region, all states issued their own

⁴⁹ The income classification divides economies according to 2005 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income \$875 or less; lower middle income \$876–\$3,465; upper middle income \$3,466–\$10,725; and high income \$10,726 or more.

banknotes, while two thirds of the states in Europe and sub-Saharan Africa were also in this category.⁵⁰

- Multilateral central banks issued banknotes for 33 countries—18 percent of the IMF member states. There are four multilateral central banks, with two in Africa—Banque Centrale des États de l'Afrique de l'Ouest (BCEAO)⁵¹ and Banque des États de l'Afrique Centrale (BEAC)⁵²—one in Europe—the European Central Bank (ECB)⁵³—and one in the Western Hemisphere, Eastern Caribbean Central Bank (ECCB).⁵⁴
- Another country's currency was used in seven countries, 4 percent of the total. In all these cases, the currency was the U.S. dollar. Four of the countries were in the western Pacific—Marshall Islands, Micronesia, Palau, and Timor-Leste, and three countries in Latin America—Ecuador, El Salvador, and Panama.⁵⁵
- In 37 percent of the high-income countries, the banknotes were issued by the ECB.
- The only upper middle-income countries not issuing banknotes from their own central banks were Palau and Panama (both using the U.S. dollar); the six IMF member states in the ECCB and Equatorial Guinea and Gabon (all using multilateral central banks).

⁵⁰ The Central Bank of Liberia issued banknotes, but the U.S. dollar is, in addition, recognized as legal tender. Also, since 1992, the Central Bank of Sudan issued the Sudanese dinar but as part of the Comprehensive Peace Accord of January 2005, the 10 states of southern Sudan was allowed to use the U.S. dollar and three neighboring countries' national currencies as legal tender in its part of the country. For the purpose of this study, Liberia and Sudan were placed in the category central bank issuing own banknotes.

⁵¹ The eight west African states in BCEAO were Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo.

⁵² The six central African states in the BEAC were Cameroun, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, and Gabon.

⁵³ At end-2005, San Marino, a Fund member state, used the Euro in addition to twelve EU member states—Austria, Belgium, Finland, France Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. Moreover, four non-Fund members used the Euro—Andorra, UN-administered Kosovo, Monaco, and the Vatican State. In 2005, Montenegro was in a federation with Serbia; the Federation of Serbia and Montenegro was an IMF member and had the dinar as legal tender, but Montenegro unilaterally used the Euro. In January 2007, Slovenia joined the Euro area.

⁵⁴ In addition to the six IMF member states in the ECCB—Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines—two additional participants—Anguilla and Montserrat—are not IMF members.

⁵⁵ Previously issued banknotes in colon, the traditional national currency of El Salvador, remained legal tender, but those reaching the banking system were not reissued.

C. How Many Signatures on the Banknotes?

The material from the 184 cases was reviewed with respect to the number of signatures on contemporary banknotes. From the results presented in Table 7, the following conclusions can be drawn:

Table 7. Number of Signatures on Issued Banknotes, December 2005

	None	One	Two	Three or more	Total IMF Member States
<u>Distribution by IMF Region</u>	10	73	94	7	184
of which:					
Africa	-	12	33	-	45
Asia and Pacific	6	13	15	-	34
Europe	2	26	13	1	42
Middle East and Central Asia	2	11	16	-	29
Western Hemisphere	-	11	17	6	34
<u>Countries by Income Level</u>	10	73	94	7	184
of which:					
High-income	1	21	13	-	35
Upper middle-income	2	18	16	3	39
Lower middle-income	3	15	32	3	53
Low-income	4	19	33	1	57
<u>Issuing Authority</u>	10	73	94	7	184
of which:					
Own central bank	10	54	72	7	143
Other country's central bank	-	-	7	-	7
Multilateral central bank	-	19	14	-	33
Other authority	-	-	1	-	1

Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.; MRI Bankers' Guide to Foreign Currency, 57th ed.

- About half the countries issued banknotes with two signatures. The highest proportion was in (sub-Saharan) Africa (73 percent) and the lowest in Europe with one third.
- More than one third of the countries used one signature, with the highest proportion in Europe.
- No contemporary banknotes have more than three signatures, but eight countries used three signatures—Hungary and seven countries in central and south America.

- No signature on banknotes was uncommon (4 percent) with seven such cases.⁵⁶ As previously mentioned, three countries used seals in lieu of signatures.
- The number of signatures on banknotes correlates with the issuing countries' income level: high-income countries have the largest relative share of banknotes with one signature; while lower middle-income and low-income countries have the higher share of two-signature banknotes.
- With respect to issuing authority, more than half of the countries with their own central banks issued banknotes with two signatures. Also, the two African multilateral central banks use two signatures, while the ECB and ECCB have one signature on their banknotes.

D. Who Signs the Banknotes?

From a taxonomy point of view, the study included six different cases/categories of signatures on contemporary banknotes: (i) signed by the chairman of the board of the central bank; (ii) signed by the governor of the central bank; (iii) signed by a deputy (sometimes called vice-) governor of the central bank; (iv) signed by other officials of the central bank; (v) signed by an official of the ministry of finance; and (vi) signed by other authorities. As expected, the exact titles of the various positions varied; on occasion, for example, the chairman of the board was referred to as “president,” while sometimes that title signified the governor of the central bank.

In Table 8, the data are summarized based on the taxonomy discussed above, applying the categories earlier presented in Table 6 and Table 7. Since 55 percent of the countries have two or three signatures on their contemporary banknotes, the number of observations in Table 8, which totaled 283, far exceeded the number of IMF member states.

The main conclusions that may be drawn from the data in Table 8 are:

- The single most common signature was that of *governor* of the central bank with 155 entries, representing 85 percent of all IMF member states and 55 percent of all observed signatures.
- The second most common signature was shared between *other officials of the central bank* and *officials of the ministry of finance/treasury*, each occurring in 25 percent of the member states.
- The remaining three categories were represented in 5–8 percent of the member states.

⁵⁶ In Asia, Laos, Myanmar and Vietnam; in Europe, Belarus and Russia; and in Central Asia, Azerbaijan and Uzbekistan.

Table 8. Signatures on Issued Banknotes, December 2005

	Chairman of the Board of the Central Bank	Governor of the Central Bank	Deputy Governor of the Central Bank	Other Officials of the Central Bank	Officials in the Ministry (Treasury)	Other	Total Number of Signatures
<u>IMF Regional Distribution</u>	8	155	14	49	48	9	283
of which							
Africa	-	45	6	20	6	1	78
Asia and Pacific	-	19	1	2	18	3	43
Europe	5	38	2	11	-	-	56
Middle East and Central Asia	2	22	2	2	11	4	43
Western Hemisphere	1	31	3	14	13	1	63
<u>Distribution by Income Level 3/</u>	8	155	14	49	48	9	283
of which							
High-income countries	4	29	2	4	8	1	48
Upper Middle-income	2	32	4	12	6	3	59
Lower Middle-income	2	42	3	14	24	3	88
Low-income	-	52	5	19	10	2	88
<u>Issuing Authority</u>	8	155	14	49	48	9	283
of which							
Own Central Bank	8	121	14	33	34	9	219
Other Country's Central Bank	-	1	-	1	12	-	14
Regional Multilateral Central Bank	-	33	-	15	-	-	48
Other Authority	-	-	-	-	2	-	2
<u>Number of Signatures</u>	8	155	14	49	48	9	283
of which							
One	-	66	-	3	3	3	75
Two	7	83	13	36	42	6	187
Three or more	1	6	1	10	3	-	21

Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.; MRI Bankers' Guide to Foreign Currency, 57th ed.

- For African member states, all issued banknotes included the signature of the *governor* and in addition 44 percent contained the signature of *other officials of the central bank*.
- In the Western Hemisphere, the signature of the *governor* was used in almost all countries, with the U.S. being the one prominent exception. It was equally common,

about 40 percent, to find a signature on the banknotes for *other officials of the central bank* as for *officials of the ministry of finance*.

- On European banknotes, the signature of *governor* was used in about 90 percent of the countries, but the most striking feature was that none of the banknotes included signatures of *officials of the ministry of finance*. Instead, of all the regions Europe had, in relative terms, the highest share of signatures of the *chairman of the board of the central bank* with 12 percent.
- In the Middle East and Central Asia region, the signature of *governor* was used in 76 percent of the countries. The proportion of signatures of *officials of the ministry of finance* was almost at the Western Hemisphere level with 38 percent.
- Finally, for the Asia and Pacific region, the signature of *governor* was the lowest recorded with 56 percent of the countries. The most common combination was that of *governor* plus *officials of the ministry of finance*, with the latter signature in 52 percent of the countries.

The main characteristics in the distribution based on countries' income level was that the combination of *governor/chairman of the board of the central bank* was clearly highest for the high-income countries with the other extreme being lower middle-income countries where the *governor's* signature often occurred with that of an *official of the ministry of finance*. For the upper middle-income countries and low-income countries, the combination *governor/other officials of the central bank* was most frequent.

E. Final Remarks

The results of the study on signatures on contemporary banknotes may be interpreted in terms of the degree of central bank independence. The data clearly indicate that in the high-income countries—where the discussion has been most intensive about guarding central bank autonomy from directives of the ministries of finance—the signatures of *officials from the ministries of finance* no longer feature. This provides symbolic evidence of greater central bank independence.

The case of the European Union countries the year before the issuance of the Euro banknotes provides an illustration. At the end of 2001, 15 states were part of the EU. Tables 4 and 5 above presents these and the incidence of signatures on the banknotes that were issued just before the release of the physical Euro banknotes on January 1, 2002.

This can be seen in contrast to the fact that the two signatures on all U.S. banknotes are of officials of the Treasury rather than the Federal Reserve, although the banknotes are Federal Reserve banknotes.

Appendix 1. Table A. Is the Central Bank Responsible for the State's Obligations, and Vice Versa?

Country	Title and Date	Reference in the Law	Text
Argentina	Law No. 24,144 Charter of the Reserve Bank of the Argentine Republic, amended as of March 2002	Article 3.	The National State Guarantees any liabilities undertaken by the Bank.
Armenia	The Republic of Armenia Law on the Central Bank of the Republic of Armenia, as of Dec. 28, 2005	Article 1. The Central Bank of the Republic of Armenia	6. The Central Bank and the Government of the Republic of Armenia shall bear no responsibilities for their respective obligations if not assumed such.
Belgium	Constitution of Belgium of 1970	Section II - Share capital and rights attaching to shares. Article 10.	Shareholders shall be liable for losses only to the extent of their interest in the Bank.
Bosnia and Herzegovina	Law on the Central Bank of Bosnia and Herzegovina, amended as of March 7, 2003	Article 29. Coverage of shortfalls in capital of the Central Bank	Whenever: a. on a quarterly pro-forma (un-audited) balance sheet of the Central Bank prepared pursuant to Article 64 the value of its assets falls below the sum of its liabilities and its unimpaired authorized capital, or b. the net profit of the Central Bank for any financial year is insufficient to increase the authorized capital of the Central Bank to a level equivalent to five percent of the aggregate amount of monetary liabilities (as defined by Article 32) shown on the balance sheet of the Central Bank for the end of that financial year, the Ministry responsible for the budget of Bosnia and Herzegovina shall, within two months after submission of that balance sheet to the Presidency of Bosnia and Herzegovina, provide Convertible Marka in such amount or amounts as shall be necessary to remedy this deficit.
		Article 30. Restrictions on allocation of net profit	No transfer, redemption or payment pursuant to Article 27 or 28 shall be made if, as a result thereof, in the opinion of the Governing Board of the Central Bank, the assets of the Central Bank would be less than the sum of its liabilities and unimpaired capital and reserves.

Country	Title and Date	Reference in the Law	Text
Cape Verde	Organic Law of the Bank of Cape Verde of May 29, 2002	Article 57 - (Income for the Year)	8. If the Bank incurs a net loss during any financial year: (a) This loss shall be applied to the General Reserve, and if the latter should prove insufficient to cover the total amount of the loss, the balance of the loss should be transferred to unappropriated earnings; (b) After the submission, by the Bank, of a report or statement confirming the balance of the cumulative losses, the Government shall deliver to the Bank, within a maximum period of 60 days, funds, negotiable instruments that are dated and on market-determined terms and conditions and at market-determined exchange rates, in the amount or amounts necessary to make up the deficit.
China	Law of the People's Republic of China on the People's Bank of China (12/27/2003)	Article 4	The People's Bank of China assumes the following functions: (8) Manage the State treasury;
		Article 38	The People's Bank of China shall have an independent budget arrangement. Its budget shall be reviewed by the fiscal authority and become part of the central government budget. Its execution is subject to the supervision of the fiscal authority under the State Council.
		Article 39	The People's Bank of China [shall] surrender to the central budget its net profit each accounting year after making general provisions at a level set by the fiscal authority. Losses of the People's Bank of China shall be covered by fiscal appropriation from the central budget.
Congo, Democratic Republic	Law 005/2002 of May 7, 2002 on the Establishment, Organization, and Operations of the Central Bank of the Congo	Article 52	The government shall be liable for net losses sustained by the Bank if, at any time, the general reserve account and the special reserve accounts are depleted.
Croatia	Law on the Croatian National Bank, new law enacted on April 5, 2001	Article 1. Subject Matter of the Law	(2) Obligations of the Croatian National Bank shall be guaranteed by the Republic of Croatia.

Country	Title and Date	Reference in the Law	Text
Dominican Republic	Dominican Republic - Monetary and Financial Law No. 183-2 of December 3, 2002	Article 16. Net Worth, Accounting, and Financial Statements System	When a deficit is generated [in a fiscal year], it shall be covered first by debiting the General Reserve Fund. If this is not sufficient to cover the deficit, the Government shall absorb the difference by a direct of funds to the Central Bank or by issuing a Treasury Bill, whose maturity shall not exceed one (1) year, for the total amount of the difference, at an interest rate that may not be less than the market interest rate. This Treasury Bill may be broken up by the Central Bank in order to trade it on the secondary market. The Government shall include the payment of this Bill in its budget the year after it is issued.
		Article 82. Debts and operational deficit	The government will fully cover the cumulative deficit of the Central Bank, debts of the public sector with the Central Bank existing when this Law comes into force, and losses generated as a result of application of Article 84 of this Law, either by <i>issuing bonds in local currency with a maturity of at least fifty (50) years</i> , or by allocating funds obtained by the government through long-term international financing, or through a combination of the two. <i>In the case of bond issuance in local currency, the benchmark interest rate will be up to 2 percent, and interest will start to accrue ten (10) years after the date of issue.</i> The government will transfer such bonds to the Central Bank, within one year from the date on which the Law comes into effect. For these purposes, the Central Bank shall present a study to the government, within six months following promulgation of this Law, giving details of the items referred to in this Article. The government will issue the bonds through decree; their use will be restricted to the purposes indicated in this Article.

Country	Title and Date	Reference in the Law	Text
El Salvador	Charter of the Central Reserve Bank of El Salvador, Reforms of may 23, 1996, amended by the Monetary Integration Law of 2001	Chapter II-Assets. Article 7	In no case may transfers be made from the Bank's capital and reserves, nor from the special funds, nor from its net profits or undistributed profits, in favor of public or private institutions. Exceptions to the above shall be contributions to the Fund for the Protection of Bank Officials and Employees, and to the Superintendency of the Financial System, as well as contributions to the Fund for the Consolidation and Strengthening of Financial Institutions pursuant to the Law governing the Financial Consolidation and Strengthening of Commercial Banks and Savings and Loan Associations, and contributions relating to Article 6(c) above. [Article 6(c) states: any net end-of-year profits shall be assigned in the following order: ...(c) to the State, 10 percent of profits after deduction of the above]
		Chapter XV - Transitional Provisions. Article 100.	The State shall make up the Bank's losses on the operations established in the Law on the Financial Recovery and Strengthening of Commercial Banks and Savings and Loans Associations, in a manner to be prescribed by the Ministry of Finance.
Estonia	Law on the Central Bank of the Republic of Estonia of 18 May 1993, last amendment - RT I 1999,16, 271	Article 3. Independence of Eesti Pank	(2) Eesti Pank shall not to be held liable for the financial obligations of the State, nor shall the State be held liable for the financial obligations of Eesti Pank.
European Central Bank	Protocol on the Statute of the European System of Central Banks and of the European Central Bank, amended as of June 1, 2004	Allocation of net profits and losses of the ECB - Article 33.2	In the event of a loss incurred by the ECB, the shortfall may be offset against the general reserve fund of the ECB and, if necessary, following a decision by the Governing Council, against the monetary income of the relevant financial year in proportion and up to the amounts allocated to the national central banks in accordance with Article 32.5.
Fiji	Chapter 210 - Reserve Bank of Fiji of 1973, amended as of 1998	6. Capital	(5) The Minister, notwithstanding any other provision of this Act, shall cause to be transferred to the ownership of the Reserve Bank <i>non-negotiable non-interest bearing securities</i> issued by the Government from time to time for such an amount as is necessary for the purpose of preserving the paid-up capital from any impairment whenever, in the opinion of the Board, the assets of the Reserve Bank are less than the sum of its liabilities and paid-up capital.

Country	Title and Date	Reference in the Law	Text
		34. Revaluation Reserve Account	(2) Any net loss arising from any such change referred to in subsection (1) shall be set off against any credit balance in the Revaluation Reserve Account and, notwithstanding any other provision of this Act, if such balance is insufficient to cover that loss, the Government shall cause to be transferred to the ownership of the Reserve Bank non-negotiable non-interest bearing securities issued by the Government to the extent of any deficiency.
Finland	No. 214/1998 Act on the Bank of Finland-Issued on 27 March 1998	Section 8. Capital	The Bank of Finland shall have primary capital and a reserve fund. The reserve fund can be used for increasing the primary capital or for covering losses, as prescribed in section 21.
		Section 21. Monetary income and allocation of profits	<p>The monetary income accruing within the European System of Central Banks in the performance of its monetary policy function shall be calculated and allocated between the national central banks in accordance with the provisions of the Statute and the decisions made by the Governing Council of the European Central Bank. Half of the profit, following allocation of the monetary income that has accrued within the European System of Central Banks, shall be transferred to the reserve fund. The remaining profit shall be made available for use in accordance with the needs of the state. The Parliamentary Supervisory Council may decide on use of the profit for other purposes if this is justifiable because of the Bank's financial condition or the size of the reserve fund.</p> <p>Parliament shall decide on the disposal of the profit made available for use in accordance with the needs of the state. If the Bank's annual accounts show a loss, the loss must be covered out of the reserve fund.</p> <p>If the reserve fund is insufficient to cover part of the loss, the uncovered part of the loss may be left temporarily uncovered. Any profits in subsequent years shall be used first to cover such uncovered losses</p>

Country	Title and Date	Reference in the Law	Text
Ghana	Bank of Ghana Act, 2002 Act 612	7. Revaluation Account	<p>(4) Where the profits referred to under subsection (1) are insufficient to cover the losses of the Bank in a financial year, the Government shall cause to be issued to the Bank redeemable negotiable interest bearing securities to the extent of the deficiency.</p> <p>(5) A credit balance in the Revaluation Account at the end of a financial year of the Bank shall be applied to redeem the outstanding securities issued under subsection (4).</p>
		40. Liabilities for issue	<p>(1) The currency cover assets of the Bank shall be available to meet only the liabilities of the Bank as represented by the total of the amount of currency notes and coins issued by the Bank and are in circulation.</p> <p>(2) Where at any time the assets of the Bank including funds in the General Reserve Fund and the Revaluation Account are insufficient to meet demands for the redemption of notes and coins, that deficiency shall be a charge on the Consolidated Fund.</p>
Georgia	The Organic Law of Georgia on the National Bank, as amended - October 23, 2001	Article 3. Independence of the National Bank	2. The National Bank is economically independent and shall cover all expenses with its own revenue. The National Bank shall not be responsible for the liabilities of the Government of Georgia. Likewise, the Government shall not be responsible for the liabilities of the National Bank, except in cases when the National Bank and the Government have committed themselves to guarantee such liabilities.
Germany	Bundesbank Act of 23 March 2002	Article 42. Issue of liquidity paper	<p>(1) The Federal Republic of Germany shall supply the Deutsche Bundesbank on request with Treasury bills or Treasury discount paper in the denominations and on the terms of the Bank's choice (liquidity paper) up to the maximum amount of 25 billion euro. The liquidity paper is payable at the Bank. The Bank is liable to the Federal Republic of Germany for meeting all obligations arising from the liquidity paper.</p> <p>2) The par value of the liquidity paper issued shall be entered in a special account by the Deutsche Bundesbank. The funds may be used only to redeem liquidity paper that has fallen due or been repurchased by the Bank prior to maturity.</p>

Country	Title and Date	Reference in the Law	Text
Guatemala	Organic Law of the Bank of Guatemala, Decree 16/2002 of April 23, 2002	Article 9. Allocation of net deficits	If after covering its operating expenditure, the Bank of Guatemala has insufficient income to cover the cost of implementing the monetary, exchange, and credit policy determined by the Monetary Board, the resulting deficit shall be applied as follows: (a) Charged to the General Reserve account; and (b) If the balance of resources or special assets in the General Reserve account is not sufficient to fully or partially cover the net deficits, these shall be absorbed by the Government. Within a period not exceeding 30 days from the end of the fiscal year in question, the Monetary Board shall begin to make arrangements with the executive branch through the Ministry of Public Finance for the amount of the uncovered deficit to be included in the draft General Income and Expenditure Budget of the Government for the following fiscal year, in which case the Ministry of Public Finance shall make provision for covering said net deficits with Treasury bills or other financial instruments available to that Ministry, which shall yield interest at market rates and be negotiable by the Bank of Guatemala on the national or international secondary market.
		Article 58. Limitation of liability.	When the Central Bank acts as fiscal agent of the government, it shall not assume liability for any financial or other obligations derived from the government's failure to pay the principal, interest, commissions, or any other commitment, financial or otherwise.
Iceland	Act on the Central Bank of Iceland [adopted on May 18, 2001]	Article 1.	The Central Bank of Iceland is an independent institution owned by the State. Its governance is subject to the provisions of this Act. All obligations of the Central Bank are guaranteed by the State Treasury.
Jordan	Law No. 23 of the year 1971 on the Central Bank of Jordan, amended as of 1992.	Article 9. Allocation of net deficits	(d) If the reserves are insufficient to cover any loss in the profit and loss statement for any financial year, an amount sufficient to cover the deficiency shall be paid by the Government within the first three months following the end of the financial year. Such payment shall be a first charge in favor of the Government on the profits which may subsequently be realized.
Kazakhstan	Law No. 2155 of March 30, 1995 on the National Bank of Kazakhstan, amended as of July 10, 2003	Article 22. The government of the Republic of Kazakhstan and the National Bank of Kazakhstan.	The government shall not be liable for the obligations of the National Bank of Kazakhstan, just as the National Bank of Kazakhstan shall not be liable for the obligations of the government, with the exception of those cases in which it assumes such liability.

Country	Title and Date	Reference in the Law	Text
Kenya	The Central Bank of Kenya Act, amended as of January 1, 2001	9. General Reserve Fund.	<p>(1) The Bank shall establish and maintain a fund designated as the General Reserve Fund, to which shall be transferred at the end of each financial year at least ten per centum or any other amount as the Board, in consultation with the Minister, may determine, of the net annual profits of the Bank after allowing for the expenses of operation and after provision has been made for bad and doubtful debts, depreciation in assets, contributions to staff benefit funds, and such other contingencies and accounting provisions as the Bank deems appropriate.</p> <p>(2) Subject to subsection (1) and section 51, the net annual profits of the Bank, calculated in accordance with this section, shall be paid into the Consolidated Fund.</p> <p>(3) <i>The amount of any net losses of the Bank in any financial year which is in excess of the sums standing to the credit of the general reserve fund of the Bank shall be charged upon and paid out of the Consolidated Fund without further appropriation than this Act.</i></p>
Korea	The Bank of Korea Act, amended as of 1997	Article 100 (Recovery of Loss)	Any loss incurred by the Bank of Korea during any fiscal year shall be offset from the reserves and, should these be insufficient, the deficiency shall be made-up by the Government in accordance with the Budget and Accounts Act.
Kuwait	Law No. 32/1968 Concerning Currency, the Central Bank of Kuwait and the Organization of Banking Business	Article 17	(c) If the General Reserve Fund, in any year, is insufficient to meet the losses of the Bank, or if it can not be used to meet the losses, the Government shall cover the deficit.
		Article 48	The Central Bank shall enter in a Special Account the profits realized and the losses incurred as a result of altering the exchange rate of the Kuwaiti currency or any foreign currency, or altering the value of gold in terms of the Kuwaiti currency, as well as the profits resulting from the withdrawal of currency notes and coins under the provisions of Articles (10) and (11) of this Law. Credit balances on this account shall not be entered in the Profit and Loss Account of the Bank. Debit balances shall be met by the Government unless the Board of Directors decides otherwise.

Country	Title and Date	Reference in the Law	Text
Kyrgyzstan	Law of the Kyrgyz Republic on the National Bank of the Kyrgyz Republic of August 6, 1997	Article 1. The National Bank of the Kyrgyz Republic	5. The Kyrgyz Republic shall not bear responsibility for the obligations of the Bank of Kyrgyzstan. The Bank of Kyrgyzstan shall not bear responsibility for the obligations of the Kyrgyz Republic.
Lao PDR	The Bank of The Lao PDR--Law No. 5 dated October 14, 1994, amended as of October 20 1999	Article 34: The methods of accounting the Special Reserve Account.	If the Bank of the Lao PDR has any net losses in any financial year arising from any such change as stipulated in Article 33 above such losses shall be set off against any credit balance in the Special Reserve Account. If such balance is insufficient to cover such losses, the Government shall issue to the Bank non-negotiable securities to the extent of the deficiency on such terms and conditions as the Bank of the Lao PDR may determine.
Lesotho	Central Bank of Lesotho Bill 2000	20. Paid-up capital of the Bank	(6) Notwithstanding this Act, where in the judgment of the Board, the assets of the Bank are less than the sum of its liabilities and minimum paid-up capital, the Board shall notify the Minister who shall authorize the transfer to the Bank of funds, negotiable securities bearing market-related terms and conditions or foreign exchange for the purpose of preserving the minimum paid-up capital of the Bank from impairment.
Liberia	An Act to Authorize the Establishment of the Central Bank of Liberia of 1999	20 Banknotes and Coins	(2) The Central Bank shall, however, be deemed to have issued Liberian coins authorized to be minted in accordance with Section 1173 of Title 35 of the Liberian Code of Laws of 1956 and transferred by the Government to the National Bank of Liberia for circulation, with an equivalent amount of <i>non-negotiable, non-interest-bearing securities</i> having been issued by the Government for the purpose of covering any liabilities now assumed by the Central Bank for coins issued and outstanding as of that date, pursuant to the National Bank Act
Lithuania	Law on the Bank of Lithuania, Law No. I-678 of December 1, 1994, last amendment - March 13, 2001	Article 2. Legal Status of the Bank of Lithuania	4. The State of Lithuania shall not be liable for the obligations of the Bank of Lithuania, and the Bank of Lithuania shall not be liable for the obligations of the State of Lithuania.
Macedonia	Law on the National Bank of the Republic of Macedonia, as of 2005	Article 51	The National Bank shall not guarantee the assumed liabilities of the bodies under paragraph 1 of this Article and shall not purchase directly their debt instruments. [paragraph 1 states "The National Bank shall not extend loans and credits to the central government and government administration bodies."]

Country	Title and Date	Reference in the Law	Text
Malawi	Reserve Bank of Malawi Act, Laws of Malawi Chapter 44:02 adopted in 1989	5.-	(1) The capital of the Bank shall be three million Kwacha. (2) The capital may, from time to time, be increased by such amount as the Board may resolve with the consent of the Minister, and the Government shall subscribe and pay up, at par, the amount of such increase; and the Government shall ensure that the Bank is kept solvent at all times. (3) The capital shall be exclusively held by the Government. (4) The Bank shall create and maintain reserves in accordance with section 54 of this Act.
		54.-	(2) The profit of the Bank shall be distributed in the following order- (b) in the event of a loss incurred by the Bank, such loss shall be deducted from the General Reserve Fund and if the General Reserve Fund is exhausted, the Government shall immediately cover the remaining loss without an appropriation Act being necessary. (5) Results from any devaluation or revaluation of the Malawi currency shall be posted directly into a special account without affecting the Bank's profit and loss account and any devaluation losses shall be covered by <i>promissory notes of the Government on such terms and conditions as shall be agreed upon between the Minister and the Bank.</i>
Mongolia	The Bank of Mongolia October 1, 1996	Article 37. Determination of net income	3. In determining the revaluation of assets and liabilities the Bank of Mongolia shall be guided by the following principles: 1) if there is a difference between the value of the assets and precious metals of the State foreign currency reserve and the value of the equity fund after the revaluation of those funds that difference shall be made up from assets in the revaluation fund; 2) if by the end of the financial year it is not possible to make up such difference from the revaluation fund and the general reserve fund the Government shall, within four months after the end of that financial year, issue obligations at market interest rates and places them with the Bank of Mongolia.

Country	Title and Date	Reference in the Law	Text
Namibia	Bank of Namibia Act, 1997 (Act No. 15 of 1997)	31. Revaluation Reserve Account	(2) (a) Where in any financial year the Bank incurs net losses arising from the change in value referred to in subsection (1), such losses shall be set off against any credit balance in the Revaluation Reserve Account. (b) If the balance in the Revaluation Reserve Account is insufficient to cover such losses, the Government shall issue to the Bank <i>non-negotiable securities to the extent of the deficiency, on such terms and conditions as the Minister and the Board may agree upon.</i>
Nicaragua	Organic Law of the Central Bank of Nicaragua, Law No. 317 of March 30, 2001	Article 10.	Losses that the Bank might incur in a particular fiscal year shall be applied to the reserves that have been formed in prior fiscal years and, should this be impossible, shall affect the capital of the institution. In this case, the Government of the Republic will transfer to it negotiable public securities, that will produce interest at a rate equal to the average deposits rate in the banks, for the amount necessary to cover the capital shortfall.
Nepal	Nepal Rastra Bank Act of 2002	42. Allocation of Net Loss:	(2) The loss that cannot be adjusted after making allocation pursuant to sub-section (1), His Majesty's Government shall bear the loss.
New Zealand	Reserve Bank of New Zealand Act 1989, amended as of August 20, 2003	21. Foreign exchange gains and losses	(2) The Minister shall, without further appropriation, pay to the Bank out of the Crown Bank Account the amount of any exchange losses (whether realized or unrealized) incurred by the Bank as a result of dealing in foreign exchange under sections 17 and 18 of this Act.
Nicaragua	Organic Law of the Central Bank of Nicaragua, Law No. 317 of March 30, 2001	Art. 6.	The Central Bank shall have the authority to directly incur liabilities deriving from international loans aimed at strengthening the Balance of Payments or at the Bank's institutional development. In such cases, the Central Bank will be responsible for budgeting and making the corresponding payments using its own resources.
Oman	Central Bank of Oman - Royal Decree No. 114 /2000 Issuing The Banking Law	Article 35: Deficiencies in General Reserve Fund	If at the conclusion of any annual accounting period, the general reserve fund is insufficient to cover the losses of the Central Bank for the previous year, the deficiency shall be a liability of the Government of the Sultanate and shall be paid by the Government of the Sultanate within 90 days. Any deficiency shall continue to be a liability of the Government until such payment is made to cancel the liability.

Country	Title and Date	Reference in the Law	Text
Papua New Guinea	Independent State of Papua New Guinea – An Act Entitled: Central Banking Act 2000	Article 50. Determination of profits and losses.	(4) Notwithstanding anything contained in this Act or in the Loans Securities Act (Chapter 134) or in any other law the Minister may create and issue to the Central Bank <i>non-interest bearing non-negotiable notes</i> for an amount not exceeding any payment made by the Minister to the Central Bank out of the Consolidated Revenue Fund in accordance with Subsections (1) and (2).
Paraguay	Law No. 489 - Organic Law of the Central bank of Paraguay, as of 1997	Article 39. Issuance of Banknotes and Coins	Banknotes and coins issued shall be Central Bank of Paraguay liabilities and shall be unconditionally backed by the Government.
		Article 111. Losses	Any losses incurred by the Central Bank of Paraguay in a given fiscal year shall be imputed to the reserves funded in prior fiscal years and if they should be insufficient, they shall affect capital of the institution.
		Article 114. Restatement of the International Monetary Reserve	Earnings resulting from any change in the valuation of assets or the obligations of the Central Bank of Paraguay held or denominated in gold, Special Drawing Rights, foreign currencies, or in other internationally traded units of account and resulting from changes in the value of the Guarani shall be credited to a special account called “Restatement of International Monetary Reserves”. Losses or gains resulting from such changes shall not be included in the Central Bank of Paraguay profit and loss account. Losses resulting from prior changes shall be covered by any surpluses in the “Restatement of International Monetary Reserves” account. If these should be insufficient, they shall be offset by the transfer of a non-negotiable Government bond in the amount of the resulting deficit.
Philippines	The New Central Bank Act - Republic of the Philippines, of June 10, 1993	Section 51. Liability for Notes and Coins.	Notes and coins issued by the Bangko Sentral shall be liabilities of the Bangko Sentral and may be issued only against, and in amounts not exceeding, the assets of the Bangko Sentral. Said notes and coins shall be a first and paramount lien on all assets of the Bangko Sentral.
Qatar	Law No. (33) of the year 2006 - Qatar Central Bank	Article (6)	If the accounts of the Bank show deficit of the capital, the State should issue untransferable bonds, without proceeds, to cover the deficit.

Country	Title and Date	Reference in the Law	Text
		Article (8)	The Bank shall have a general reserve account to which 10% of the annual net profits shall be transferable. The necessary amounts for redemption of the bonds issued in accordance to the second paragraph of Article (6) of this law shall be drawn from the remaining percentage.
Romania	Law on the Statute of the National Bank of Romania of May 26, 1998, amended as of June 28, 2004	Article 44. Loss coverage	In the event of a loss incurred by the National Bank of Romania during a financial year, the loss shall be covered from the available sources in the following priority order: a) special revaluation account; b) statutory reserves.
Russia	Federal law No. 86-FZ of the Russian Federation of July 10, 2002, amended as of June 12, 2006	Article 2	The State shall not be liable for the obligations of the Bank of Russia, nor shall the Bank of Russia be liable for the obligations of the State, unless they have assumed such obligations or unless otherwise provided by federal laws.
		Article 30.	Banknotes and coinage of the Bank of Russia shall constitute unconditional obligations of the Bank of Russia and shall be guaranteed by all of its assets.
Rwanda	Law No. 11/97 OF 26/7/1997 - Regarding Statutes of the National Bank of Rwanda	Article 45.	<p>Profits and losses resulting from fluctuations of exchange rates are charged to profit and loss account of the Bank. However, profits or losses resulting from revaluation of foreign exchange holdings and international commitments registered to the balance of the Bank due to a revision of foreign exchange system or a modification of the value of exchange rate of franc decided by the Government are accounted for in a special account entitled 'Revaluation Account', and are not considered in the final profit and loss account of the Bank.</p> <p>The Government guarantees the Bank against any loss that would result from such a revaluation. On Bank requirement, the <i>Government will issue Treasury Bills not negotiable and non interest-bearing</i>, for an amount equivalent to the debit balance of revaluation account. These Treasury Bills will be refundable by deduction from the Government share of <i>Bank profits</i> according to a schedule agreed upon with the Minister having Finances in his attributions.</p>

Country	Title and Date	Reference in the Law	Text
Sierra Leone	The Bank of Sierra Leone Act, 2000	Article 11	(7) If the Bank incurs any net loss during any financial year such loss shall be charged to the General Reserve; and if the General Reserve is inadequate to cover the entire amount of the loss, the balance of loss shall be carried forward in an account for accumulated losses.
			(8) The balance of accumulated losses shall be replenished by Government by transferring to the Bank funds negotiable securities bearing market-related terms and conditions or foreign exchange on the lines indicated in subsection (6) of section 10.
			(9) If in any financial year there are accumulated losses carried forward from previous years and which losses have not yet been replenished by Government in the manner provided in subsection (8), the final profit of that year shall be allocated in priority to the cancellation of such accumulated losses. The allocations stipulated in subsections (2), (3), (4) and (5) shall refer only to the balance of profits which remains after the cancellation of accumulated losses carried forward from previous years.
Serbia	Law on the National Bank of Serbia of 2004	Article 1.	The Republic of Serbia shall guarantee for the obligations of the NBS.
Singapore	The Monetary Authority of Singapore Act - Chapter 186, amended as of 2005	MISCELLANEOUS - 38. Guarantee by Government	(1) The Government shall be responsible for the payment of all moneys due by the Authority.
Spain	Law of Autonomy of the Banco de España - Law 13/1994, of June 1, amended as of December 27, 2004	Preamble	Autonomy for our central bank requires, in the first place, that the Treasury shall not run overdrafts on its account with the Bank even on a temporary basis, because this would deprive the Bank of its initiative in the process of money creation. In keeping with an additional precautionary provision of the EU Treaty, the Bank may not acquire directly from the Treasury any securities issued by it, although it may conduct operations in the public debt market. Autonomy also means that in the area of monetary policy, the Bank shall not take instructions from the government or the Economy and Finance Minister, enabling it to direct its policy toward its primary objective of maintaining price stability.

Country	Title and Date	Reference in the Law	Text
			As a result of the foregoing, and in response in general to the conditions set out in the protocol under which the Statutes of the European System of Central Banks and of the European Central Bank was approved, the new design of the Bank is altered definitively from that established in the Legislative Decree on the Nationalization of the Bank in 1962, which made it in all respects a direct arm of the government and maintained its traditional function of financing the government. The current legal text, in contrast, continues a trend begun in 1980 with Law 30/1980, of July 21, on the Governing Bodies of the Bank, which granted it a significant degree of instrumental autonomy and limited the possible causes for the dismissal of the Governor.
Tajikistan	Law of the Republic of Tajikistan on the National Bank of the Republic of Tajikistan, amended as of December 14, 1996	Article 1. Legal Status of the National Bank of Tajikistan	The Republic of Tajikistan shall not be liable for the obligations of the National Bank of Tajikistan, except for those assumed with consent of the Madjlisi Oli of the Republic of Tajikistan or the President of the Republic of Tajikistan; and the National Bank of Tajikistan shall not be liable for the obligations assumed by the Republic of Tajikistan without consent of the National Bank of Tajikistan.
United Arab Emirates	Union Law No. (10) of 1980 Concerning the Central Bank, the Monetary System and Organization of Banking	Article (52)	3) Should the Account show a net credit balance at the end of the financial year, said balance shall not be included in the Bank's profit. Should the account show a net debit balance, the Government shall cover it by issuing <i>non-interest bearing, negotiable Treasury Bonds, which shall in turn be returned out of any net profits realized in subsequent years.</i>
Uzbekistan	Law of the Republic of Uzbekistan On The Central Bank Of The Republic Of Uzbekistan No. 154-I dated 12/21/95, Amended as of December 15, 2000	Article 6. Independence of the Central Bank.	The state shall not be liable for obligations of the Central Bank, nor shall the Central Bank be liable for obligations of the state, unless they themselves have accepted such obligations, or unless foreseen otherwise by legislative acts.

Country	Title and Date	Reference in the Law	Text
Venezuela	Law on the Central Bank of Venezuela, amended as of September 4, 2001	Article 72	<p>In the event that the balances in the accounts for undistributed earnings and capital reserves, as mentioned in the preceding article, should prove insufficient to cover financial imbalances during a fiscal year, the Republic shall be responsible for making the contributions required to replenish them.</p> <p>When such imbalances persist, the Republic must make the necessary contributions to remedy them.</p> <p>For the purposes of this Article, such contributions shall be made by allocating the corresponding credits in the budget for the fiscal year following that in which the amount required was determined. In the event that the tax accounts do not allow the budgetary allocation to be made, the National Assembly shall authorize a special issue of national public debt securities, under market conditions and with expiration not exceeding five (5) years.</p>
Zambia	The Bank of Zambia Act, No. 43 of 1996	6. Capital	<p>(5) Whenever the Board certifies that the assets of the Bank are less than the sum of its capital and other liabilities, the Minister notwithstanding the provisions of any other written law, shall, on behalf of the Government cause to be transferred to the ownership of the Bank negotiable and interest bearing securities issued by the Government for such amount as is necessary for the purposes of preserving the capital of the Bank from any impairment.</p>

Appendix 2. Case Study—United States

[To be completed]

There are a number of interesting features of the U.S. situation, in particular as they explain the prevalence of the U.S. “integrated” view. The U.S. Treasury has the power to issue bearer currency notes and did so from 1863 through 1971. It also takes full responsibility for redeeming them as well as Federal Reserve notes. “Both United States Notes and Federal Reserve Notes are parts of our national currency and both are legal tender. They circulate as money in the same way. However, the issuing authority for them comes from different statutes. United States Notes were redeemable in gold until 1933, when the United States abandoned the gold standard. Since then, both currencies have served essentially the same purpose, and have had the same value..... United States Notes (characterized by a red seal and serial number) were the first national currency, authorized by the Legal Tender Act of 1862 and began circulating during the Civil War. The Treasury Department issued these notes directly into circulation, and they are obligations of the U.S. Government. The issuance of United States Notes is subject to limitations established by Congress. It established a statutory limitation of \$300 million on the amount of United States Notes authorized to be outstanding and in circulation. While this was a significant figure in Civil War days, it is now a very small fraction of the total currency in circulation in the United States”.⁵⁷

[Provision in FR Act for liquidation of Fed and coverage of liabilities by government]

⁵⁷ <http://www.ustreas.gov/education/faq/currency/legal-tender.shtml> .

Appendix 3. Case Study: Sweden—Events in the Early History of Banknotes

First modern banknotes

It is sometime suggested that the modern banknotes and central banks both trace their origins to Sweden in the 1660s. At that time, a militarily powerful multi-ethnic Swedish kingdom dominated areas around the Baltic Sea.⁵⁸ The currency in circulation in Sweden consisted of foreign, mostly silver, coins, as well as domestically minted coins which, since the year 995, had largely been minted under the control of the Swedish king.

In the 1600s, Sweden had the largest known copper production in the world, but not much gold or silver. Consequently, the many circulating domestic coins were made of copper. For the higher denominations, *plåtmynt*, special solid plates of copper with stamps to indicate the weight and thereby the value, were used. The largest plate money—the 10 *daler* made in 1644–45—weighed 19.7 kg (43 lb), making it highly impractical.

In 1656, a royal license was granted to a company set up by Johan Palmstruch to carry out banking business. The new bank, *Stockholms Banco*, started operations the next year and became an unusual private bank. Palmstruch came from Riga, at that time the largest city and most important port in the Swedish realm. Palmstruch was inspired by Dutch banking and his idea was to accept metal currency as deposits in *Stockholms Banco* and in return issue to the bearer non-interest-bearing, fixed denomination paper notes that could easily be used in payment transactions.⁵⁹ The new banknotes, called *credityf-sedlar*, were not receipts for specific currency deposited, but could be exchanged for metal currency on demand. Thus, in 1661, these first modern banknotes were printed, signed by hand by Palmstruch and seven other officials of *Stockholms Banco*, and two seals were applied.⁶⁰

⁵⁸ In 1660, the Swedish realm included besides present day Sweden also Finland, Estonia, parts of northern Latvia, Russian territories around the Bay of Finland, parts of northwestern Poland, and several parts of northern Germany.

⁵⁹ The banknotes were denominated in *daler silver mynt* or *riksdaler specie*, which could both be exchanged for Swedish silver coins, or in *daler kopparmynt*, which could be exchanged for Swedish copper coins. The number of denominations varied with the currency:

- for *daler silver mynt*, 13 denominations: 10, 25 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, and 1,000;
- for *riksdaler specie*, 11 denominations: 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, and 1,000; and
- for *daler kopparmynt*, 24 denominations: 5, 10 12½, 25, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, and 1,000.

⁶⁰ The Chinese had printed and used paper money since around 600 A.D., but these did not meet the current criteria for banknotes.

The banknotes became a direct success and the bank expanded greatly. In the boom that followed, the leadership of *Stockholms Banco* could not resist the temptation to issue significantly more banknotes than was motivated by deposits made. The resulting banknote overhang became evident when economic activity slumped and a rapidly increasing number of banknotes were sent back to be exchanged for metal currency. As a result, in 1664, *Stockholms Banco* failed, creating considerable turmoil. Palmstruch was sentenced to death, but was spared and spent the rest of his life in jail.

The Parliament's bank

Noting the experience of *Stockholms Banco*, leading persons of the Swedish Parliament realized what tremendous power had accompanied the issuance of paper money. In 1668, Parliament took over the license granted to *Stockholms Banco* to operate as a bank to preempt the Swedish monarchy from using the instrument to finance military operations. The new bank was named *Riksens Ständers Wäxel-Banco*,⁶¹ and is sometimes called the first central bank in the world.⁶²

It should be underscored that this institution had initially only a few similarities with a modern central bank. The issuance of banknotes was one but as will be further explained below, during more than an century this was not a monopoly but took place in competition with other institutions. Furthermore, it would take time before *Riksens Ständers Wäxel-Banco* would engage in modern monetary or foreign exchange rate policies. Still, the institution did act as the bank of the Parliament, and the central bank of Sweden has ever since been an autonomous institution under Parliament.

In view of the preceding calamities, the central bank was initially not allowed to issue banknotes. However, in 1701, the central bank launched a new instrument called *transportsedel*, transfer note, which was similar to a banknote. In 1726, these notes became legal tender for all public debt and in 1745 also for all private debt. All along, the king, represented by the government (specifically the ministry of finance), continued to be in charge of the minting of coins, the key means of payment.

It is worth noting that this difference in ownership and control of the production of banknotes and coins has remained for a long time. The responsibility for coins changed to the Swedish central bank as late as 1988.⁶³ In many other countries—also in Europe—the production of coins remains the business of the ministries of finance rather than the central banks. With respect to the introduction of the euro, the decisions about the denominations and designs were made by the European Central Bank, while the Council of Ministers decided on the coins.

⁶¹ The name can be translated as the Exchange Bank of the Estates of the Realm.

⁶² The second oldest existing central bank is the Bank of England, established 26 years later in 1694.

⁶³ In 2001, the Swedish Mint was privatized and sold to Finnish investors.

Back to the past, due to inflation in the wake of wars, the *transportsedel* could no longer be exchanged for silver coins between 1745 and 1776, leading to reduced the demand for this type of currency. In 1776, as part of a monetary reform, the old currencies—both foreign and domestic—based on copper coins were abolished. In their place, the *riksdaler banco* was introduced as a unified national currency. Its subdenomination was the *skilling* with 48 *skillingar* equaling one *riksdaler banco*.

Competing domestic currency banknotes

In 1789, the Swedish Parliament set up *Riksens Ständers Riksgälds Contoir*,⁶⁴ the National Debt Office, to limit the possibilities of the Swedish monarchy incurring debt to finance wars. The new institution was also given the right to issue a new currency called *riksdaler riksgälds* in the form of banknotes. These banknotes could not be exchanged for silver coins, which made them less desirable than banknotes issued by the central bank.

When, in addition and over time, the National Debt Office aggressively issued more banknotes, the difference in value between the two parallel currencies in circulation increased. Thus, by 1803, 1 *riksdaler banco* equaled 1½ *riksdaler riksgälds*. After another monetary crisis at the beginning of the 1800s, the issued banknotes again could not be exchanged, a situation that lasted until 1834.

The proliferation of various exchange rates for co-circulating legal tenders also extended to include banknotes issued by the central bank in *riksdaler banco* and *skilling banco* and silver coins in the denomination *riksdaler specie*. By 1834, 1 *riksdaler specie* equaled 128 *skillingar banco* or 2⅔ *riksdaler banco*, corresponding to 4 *riksdaler riksgälds*.

Milestones during the 1800s

During the 1800s, a number of important actions were taken:

- From 1830, private banks were permitted to be established with the right to issue their own banknotes. These institutions tended to be local or regional commercial banks, and this led to a dramatic increase in the volume of banknotes.
- In 1855, the decimal system was introduced for Swedish currency when 1 *riksdaler riksgälds* equaling ¼ *riksdaler specie* was transformed into 1 *riksdaler riksmünt* with the subdenomination *öre*.
- In 1867, the central bank's name was changed to *Sveriges Riksbank*.
- In 1873, in a currency reform, the *riksdaler riksmünt* was replaced by the *krona* (crown; abbreviated kr) at an exchange rate of one-for-one. The subdenomination *öre* was maintained. This took place at the same time as an agreement between Denmark

⁶⁴ The name can be translated as the National Debt Office of the Estates of the Realm.

and Sweden to establish a Scandinavian Currency Union.⁶⁵ As the basis for the currency union, all denominations of the new national currencies could be exchanged on demand for gold at a fixed peg.⁶⁶

- In 1897, the Riksbank was by law given a monopoly on issuing currency notes. Commercial banks that had issued banknotes were permitted to continue to do so until 1903, and by 1906 all of their outstanding banknotes were to be invalidated.

Modern banknote denominations

Shortly after the Scandinavian currency reform, the Riksbank initially issued banknotes in six denominations: 1 kr, 5 kr, 10 kr, 50 kr, 100 kr and 1,000 kr. During the period 1874–2007, a total of nine denominations of *krona* banknotes have been issued. They are detailed in Table B below.

Table B. Sweden: Banknote Denominations issued by the Riksbank, 1874–2007

Denominations	Year first issued	Year last issued
1 kr	1874	1940
5 kr	1874	1981
10 kr	1874	1990
20 kr	1991	ongoing
50 kr	1874	ongoing
100 kr	1874	ongoing
500 kr	1985	ongoing
1,000 kr	1874	ongoing
10,000 kr	1939	1958

Sources: Sveriges Riksbank, Standard Catalog of Sources: Standard Catalog of World Paper Money, Vol. 3, 12th ed.

The initial lowest denomination was the 1 kr banknote which, in different varieties, was issued from 1874 to 1940. During the period 1876–1940, this banknote was competing with the 1 kr silver coins. In a similar fashion and in part as a result of inflation, banknotes in the denomination 5 kr and 10 kr were over time replaced by coins after periods of co-circulation.

As regards the highest denomination, it is worth noting that from 1939 to 1958, the Riksbank issued three types of the 10,000 kr banknote. Using a typical exchange rate to the U.S. dollar at the time, this represented a value of about \$1,950. Initially, this corresponded to more than one year's wages for an average worker.

In 2007, the Riksbank continues to issue regular (non-commemorative) banknotes in five denominations: 20 kr, 50 kr, 100 kr, 500 kr, and 1,000 kr.

⁶⁵ Norway joined the Scandinavian Currency Union in 1875.

⁶⁶ The Scandinavian Currency Union was effectively abolished at the beginning of World War I, when Sweden abandoned the gold peg in August 1914.

Signatures on modern Swedish banknotes

Since the Scandinavian Currency Union, all Swedish banknotes have featured two signatures, both by officials of the Riksbank. In the earlier years, for the higher denomination banknotes, one of the signatures was the Governor's while the other was that of a Director of the Riksbank. For lower denominations, one signature could be the Deputy Governor's or both signatures could be those of Directors.

From the 1950s onward, a tendency for greater coordination had developed. With the introduction of a new variety of the lowest denomination, 5 *kronor*, in 1954, the banknotes were signed by the Governor and the Director of the Legal Department of the Riksbank.⁶⁷ A similar development occurred with the introduction of a new variety of the 10 *kronor* banknote in 1963; however, starting in 1968, the second signatory was the Chairman of the Governing Board of the Riksbank. The position of Chairman was often held by the Under-Secretary of the Ministry of Finance.

By the late 1980s, harmonization was achieved for all newly issued banknotes with two signatures, the first one being that of the Chairman of the Governing Board and the second the Governor's.

⁶⁷ An exception from this rule is the 5 *kronor* banknote issued in 1963 which for unknown reasons was signed by Sven Jøge, the Deputy Governor, rather than Per Åsbrink, the Governor of the Riksbank.

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