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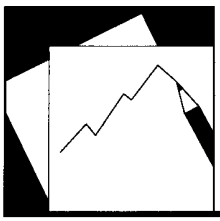

IMF Working Paper

Treasury Bills and/or Central Bank Bills for Absorbing Surplus Liquidity: The Main Considerations

Obert Nyawata

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Treasury Bills and/or Central Bank Bills for Absorbing Surplus Liquidity: The Main Considerations

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Abstract

This paper discusses the challenging question of whether central banks should use treasury bills or central bank bills for draining excess liquidity in the banking system. While recognizing that there are practical reasons for using central bank bills, the paper argues that treasury bills are the first best option especially because positive externalities for the financial sector and the rest of the economy. However, the main considerations in the choice should be: (i) operational independence for the central bank; (ii) market development; and (iii) the strengthening of the transmission of monetary policy impulses.

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EXECUTIVE SUMMARY

This paper discusses the challenging question of whether central banks should use government securities or their own securities when draining liquidity from the market. The paper argues that treasury bills are the first best option, because this would shield central banks from potential financial losses associated with issuance of own securities and from likely threats to central bank autonomy in the conduct of monetary policy. The advocacy for treasury bills is premised on: (i) an integrated view of public sector finance; (ii) the public policy argument for developing money markets; and (iii) the advantages of the inherent features that enable government securities to generate positive externalities for other financial instruments and the rest of the economy in a way that cannot easily be replicated by other instruments.

Consistent with debt management concerns, the treasury bill market should be designed with a view to sterilizing the structural liquidity of the banking sector in the cheapest possible way and contributing to the development of financial markets. In reality, many countries, especially developing and emerging market ones, use both central bank and treasury bills. In such cases, the overriding factors should be the extent to which: (i) operational independence for the central bank is ensured; (ii) the development of liquid markets is fostered; and (iii) the transmission of monetary impulses is strengthened.

I. INTRODUCTION

1. **Without effective monetary instruments, draining surplus liquidity can be a daunting task for many central banks.** Under normal circumstances, open Market operations (OMO) in various forms are the main mechanism through which central banks provide or withdraw liquidity to/from the money market, steer short-term interest rates and signal the stance of monetary policy. Most central banks have at their disposal various types of open market operations and these include: outright transactions, repos, issuance of debt certificates, foreign exchange swaps and fixed-term deposits.

2. **This paper focuses on the challenge of draining surplus liquidity—a challenge that is often acute in some emerging and developing countries—using government securities or central bank bills**.[2] It builds on the discussion in Quintyn (1996) and explores further the scope for clear guidelines on the perennial issue concerning the choice between treasury bills and central bank bills in a changed environment (i.e., with many countries having dispensed with financial repression). At the time of Quintyn's study, many developing and emerging market countries were only beginning the transition from direct to indirect instruments of monetary policy. Since then, many countries have implemented and/or aspire to conduct monetary policy through market determined instruments. Also since then, MCM has developed in-house databases that provide information on the extent of use of government and central bank securities and on central bank legal provisions on losses/profits and capital.

3. **Without sufficient securities, the central bank's success in draining surplus reserves will be limited, as will any impact on interest rates.** Government securities and central bank bills are the main debt instruments used and to different degrees, the primary issuances of them have been used to drain surplus liquidity.[3] For monetary policy and liquidity management purposes, the focus is typically on government securities (treasury bills) and central bank bills with maturities of less than a year. Both securities have low credit risk (virtually zero credit risk) and are located at the bottom end of the risk/return spectrum.

4. **Questions often arise as to: (i) whether central banks should be indifferent between using government securities or central bank bills; (ii) what should guide the choice between the two types of securities; and (iii) whether there is any broad agreement on which securities to use.** Underlying these questions are concerns about potential conflicts between debt management and monetary policy objectives and by extension, tensions that may arise between central banks and ministries of finance. In practice, the choice between government securities and central bank bills seems to be an

[2] The draining of liquidity has also become a major challenge and preoccupation of many industrial country central banks subsequent to the monetary easing to deal with the recent financial crisis.

[3] For monetary policy and liquidity management purposes, the focus is typically on treasury bills and central bank bills with maturities of less than a year. The maturity structure of government paper including bonds spans a wide range.

operational issue that depends more on country circumstances, agency arrangements between central banks and ministries of finance and legal guidelines.

5. **The circumstances under which many central banks have started issuing their own securities seem to underscore a presumption that government securities are the first best option.** Central banks have often resorted to own securities in circumstances where the markets for government securities are undeveloped and where governments are reluctant to issue securities in sufficient amounts to absorb excess liquidity. In addition, three elements seem to accord an edge to the use of government securities over central bank bills and these include: (i) an integrated view of public sector finance; (ii) the public policy argument for the government's role in fostering the development of money markets; and (iii) the ability to generate positive externalities for other financial instruments and the rest of the economy in a way that is not easily replicable by other instruments.

6. **Unless adequate arrangements are in place to deal with central bank losses and threats to central bank autonomy, the potential threat to a central bank's balance sheets is a compelling reason for shying away from central bank securities, if possible.** However, for practical operational reasons, there are situations in which central bank bills are the better option. While agreeing with the conclusion drawn by Quintyn (1996) that the advantages and disadvantages associated with government securities and central bank bills are such that no clear preference can be put forward for either, this paper makes a stronger case for government securities on the basis of the three elements cited above.[4]

7. **In affirming the relative edge of government securities over central bank bills, this paper notes that primary issuance should not be overburdened with addressing both fine-tuning operations and structural excess liquidity.** The former should be addressed by short-term instruments such as repos (using government securities as the underlying collateral). It is also important that the proceeds from government securities used for liquidity management be placed in blocked account at the central bank. Ultimately, the cost of sterilization is a charge on the consolidated public finances, which should, in ideal circumstances and in the interest of transparency, be explicitly recognized and provided for in the government budget. However, some governments may prefer to reflect this on the balance sheet of the central bank instead of the government budget.

8. **For the most part, literature on securities used for monetary policy does not tackle the question of which instrument is preferable.** For example, Mohanty (2002) identifies examples of countries that use central bank bills for monetary policy but focuses more on strategies to improve liquidity in government securities, as do many other researchers. In particular, the wider literature also deals with the challenges of improving the depth and liquidity of securities markets as well other issues such as: the coordination of debt management and monetary operations; possible fragmentation of markets; central bank independence; possible threats to balance sheets of central banks; relationships between the central banks and treasuries; the adequacy of resources at the disposal of central banks to

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See Annex I for Quintyn's table of advantages and disadvantages of both instruments.

carry out their mandates; and money market development as a basis for the development of vibrant and long-term debt markets.

9. **The paper is organized as follows:** Section II reviews country practices with respect to the use and significance of treasury and central bank bills; Section III discusses the desirable features of securities to be used for monetary operations; Section IV discusses the issues that could be considered in making the choice; and Section V concludes.

II. Country Use Of Government Securities and Central Bank Bills

10. **The in-house database on monetary policy instruments- Information System Instruments of Monetary Policy (ISIMP) of the Monetary and Capital markets department of the IMF shows the extent of use of government securities and central bank bills within the Fund membership.** This survey based database captures inter alia, information on countries' use of treasury or central bank bills in open market operations. The latest survey was conducted in 2008.

Results from the 2008 survey

11. **The 2008 survey results, which are based on responses from 83 countries show that the extent of use of treasury bills and central bank bills among the respondents is almost the same (Table 1 and Figure 2).**[5] This in part reflects the sample's domination by developing and emerging countries where the use of both types of securities is high. Developing and emerging economies tend to have higher frequencies of situations where instruments operate side by side perhaps reflecting the reluctance of some governments to have treasury bills used for liquidity management.

12. **Some countries have switched from the use of central bank bills to the use of treasury securities for monetary policy purposes and Brazil one such case.** Before May 2002, both the treasury and the central bank issued their own paper. The two entities agreed on a strategy for the development of the domestic market and decided that treasury bills be used for monetary policy purpose as well. Accordingly, the central bank stopped issuing own bills and the treasury started issuing equivalent amounts of government securities when the outstanding central bank bills expired. The proceeds from these additional government securities were placed in a special account and could only be used to augment foreign reserves or retire foreign debts. From May 2002 to July 2004, the volume of outstanding

[5] The **industrial countries** included in the 2008 survey data are: Australia, Canada, Germany, United Kingdom, Denmark, Iceland, and Sweden. The **emerging market countries** include: Brazil, India, Peru, Singapore, Uruguay, Armenia, Azerbaijan, China, Indonesia, Kazakhstan, Mexico, Romania, South Africa, Tajikistan, Turkey, Ukraine, Belarus, Bolivia, Chile, Costa Rica, Croatia, Czech Republic, Kyrgyz Republic, Malaysia, Poland, Russia, and Thailand. The **developing countries** in the sample are: Afghanistan, Albania, the Bahamas, Botswana, Barbados, Belize, Cambodia, Cape Verde, Dominican Rep, Fiji, ECCB, Ethiopia, Ghana, the Gambia, Guinea, Guyana, Haiti, Iran, Jamaica, Jordan, Kuwait, Lao, Lebanon, Lesotho, Macedonia, Malawi, Maldives, Mauritania, Mauritius, Mongolia, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Nigeria, Oman, Papua New Guinea, Pakistan, Samoa, Saudi Arabia, Serbia, Sierra Leone, Syria, Tanzania, Trinidad and Tobago, Uganda, Uzbekistan, and Vanuatu.

government securities increased from 395 billion to 736 billion while the volume of outstanding central bank bills decreased from 126 billion to 22 billion.

13. **Many central banks statutes clearly state whether the central bank can use treasury bills or its own securities for monetary operations.**[6] There are also provisions on the distribution of central bank profits and procedures for recapitalization in the event that it is needed albeit with different levels of specificity.

Table 1. Summary Information on Use of Treasury Bills and Central Bank Bills

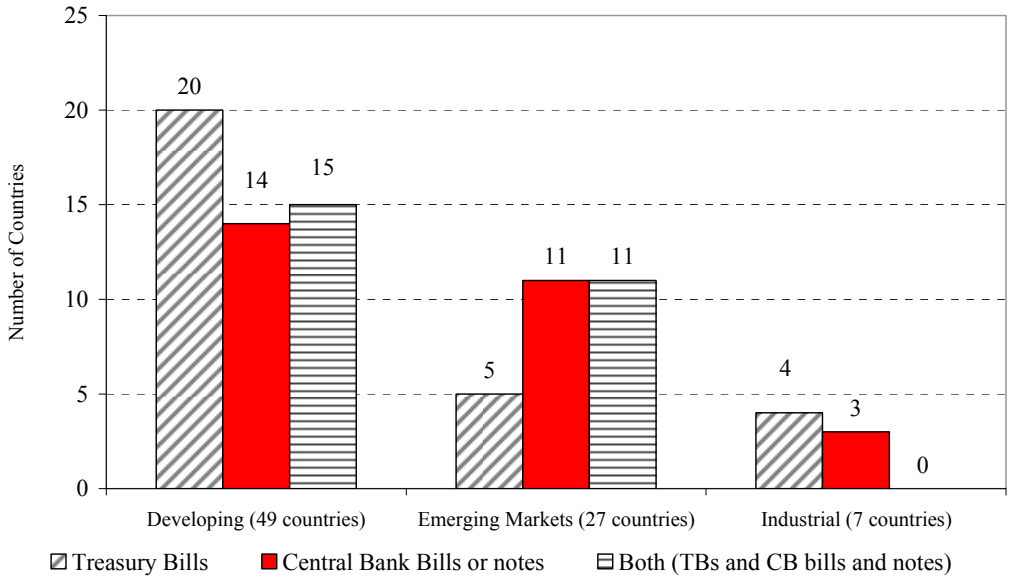
(As per 2008 Survey

	Number of Countries	in Percent of Total
Sample of Countries	84	100.0
Countries using treasury bills only	29	34.5
Countries using central bank bills	28	33.3
Countries using both treasury bills and Central bank bills	27	32.2
Total use of Treasury Bills	**56**	**50.5**
Total Use of Central Bank Bills	**55**	**49.5**

Source: ISIMP database

[6] Such information can be gleaned from the IMF/MCM Central Bank Legislation Database (2009). Stella uses this database to highlight the specific statutory provisions on these issues.

Figure 2. Monetary Policy Instruments by Level of Development
(Total Number of Countries)



Maturity profile

14. **Despite the institutional changes that have seen the setting-up of separate debt management agencies, many central banks continue to serve as agents for the primary issuance of government securities.** The maturity profiles of securities used for liquidity management and debt management tend to differ, with the former concentrating on the short end of the market (less than 12 months) while debt management ideally focuses on the long end of the maturity spectrum. In the case of financing, short-term debt tends to increase the refinancing risk and contributes to macroeconomic instability because of its susceptibility to sudden changes in market conditions. Consequently, many countries strive to restructure the maturity profiles of their debt towards the long end of the market. This effort is borne out by the decline in the proportion of short-term debt in both international and domestic securities since the mid 1990s.

15. **Data on half of the countries covered in the 2008 ISIMP survey show that, with a few exceptions, central bank bills for liquidity management generally have maturities of up to 12 months (Table 2).** Only a few of the countries indicated in Table 2 had maturities longer than 12 months (Armenia, Costa Rica, Dominican Rep, Jordan, Macedonia, Malaysia, Tajikistan, Thailand, Russia, and Uzbekistan). The table also shows that most of the bills are sold through multiple price auction formats and have weekly frequencies.

16. **The short end of the market in countries with less developed financial markets tends to have both treasury and central bank securities, while the more developed markets may have private paper such as bills of exchange, commercial paper and certificates of deposit.** A study of the development of bond markets covering Hong Kong,

Singapore, Korea, Malaysia, Thailand, Chile, Mexico, Peru, Poland and Israel, the BIS (2000) found that the public sector accounted for about half of the outstanding domestic debt securities while the corporate sector paper accounted for a quarter and the financial sector including central banks accounted for about 30 percent. Central bank securities alone accounted for 15 percent of the issuances at the end of 2000. In Chile, central bank securities accounted for 55 percent of total domestic debt issuance. This is probably the highest recorded level and reflects Chile's extensive use of such paper to sterilize large capital inflows.

Table 2. Maturity Profile of Central Bank Bills

Country	Central Bank Bills	Maximum Maturities	Auction format	Frequency of Auctions
Afghanistan	X	≤12 months	M	I
Albania	X	≤12 months	M	I
Armenia	X	≤ 15 years	M	I
Azerbaijan	X	≤4 weeks	M	W
Bolivia	X	≤ 4 years	M	W
Botswana	X	≤ 3 months	M	W
Cape Verde	X	≤12 months	M	W
Chile	X	≤ 12 months	U	W
Costa Rica	X	≤ 15 years	M	W
Denmark	X	1 week	O	W
Dominican Rep.	X	≤ 7 years	M	W
Fiji	X	≤ 12 months	O	I
Ghana	X	≤ 12 months	M	W
Gambia, The	X	≤ 12 months	M	W
Guyana	X	≤ 12 months	M	W
Haiti	X	≤ 3 months	M	W
Iceland	X	≤ 6 months	U	W
Indonesia	X	≤ 12 months	M	W
Iran, I.R. of	X	≤ 1 year	O	I
Jordan	X	≤ 10 years	O	I
Kazakhstan	X	≤1 year	M	W
Kuwait	X	≤ 1 year	O	I
Kyrgyz Republic	X	≤ 6 months	M	W
Lebanon	X	≤5 years	O	I
Macedonia	X	≤ 28 days	U	W
Malawi	X	≤ 90 days	M	I
Malaysia	X	≤ 3 years	M	W
Mongolia	X	≤28 weeks	M	W
Mozambique	X	≤ 12 months	M	D
Nepal	X	≤ 12 months	M	W
Nigeria	X	≤ 6 months	U	
Oman	X	≤ 6 months	M	W
Papua New Guinea	X	≤ 28 days	O	W
Poland	X	7 days	U	W
Russia	X	≤ 30 years	O	I
Samoa	X	≤180 days	M	W
South Africa	X	≤1 year	M	I
Serbia	X	≤ 6 months	M	L
Tajikistan	X	≤ 56 months	O	W
Thailand	X	≤20 years	M	I
Uzbekistan	X	≤ 3 years	U	I
Vanuatu	X	≤182 days	M	W

Source: ISIMP Data base, 2008 Responses to Questionnaire
M= Multiple Price; U= Uniform Price; D = Daily; W = Weekly; O = every other week; L = frequently; and I = Irregularly.

III. Desirable Features of Securities Used in Liquidity Management

17. **Central banks need securities to enable them to: manage the demand and supply of bank reserves; serve as underlying collateral for repos and support the payment and**

settlement systems. The securities used should be under the control of the central bank; avoid fragmenting the market for securities; be available in sufficient amounts and in key maturities; accord operational independence to the central bank; and enhance the transmission mechanisms of monetary policy. They should also be liquid and have minimal credit risk— qualities which both government securities and central bank bills have— to avoid financial losses. Also important are the infrastructure arrangements, which include auction formats, trading platforms, price determination and settlement arrangements; design and operation of payment systems; the design of monetary policy instruments and procedures for money and exchange market operations; and public debt and foreign exchange reserves management. These infrastructure elements not only contribute to the effective implementation of monetary and fiscal policy but also have important implications for the efficient functioning of financial markets and overall financial sector stability.

18. **Market liquidity has increasingly become an important public policy issue for central banks and policy makers in general**. In cases where financial markets are still rudimentary, it is desirable that securities used also promote market development. For overall market development, the maturity spectrum of securities should be viewed as a continuum in, which the short end, would generally address monetary policy needs while the long end addresses the government financing needs. It should also be noted that short-term treasury bills may also be required for active cash management in government.

19. **In essence, treasury bills and central bank bills have similar features, which can enable them to function equally well in managing liquidity.** However, major differences and potential conflicts can arise from institutional, legal and administrative issues pertaining to decisions on maturity profiles, constraints on volumes and the lack of formal agreements between ministries of finance and central banks.

Liquidity and its dimensions

20. **A central bank's influence on market liquidity conditions is emitted through interest rate policy decisions and the provision of clearing and settlement services.** As a concept, liquidity has various dimensions, which include: the ease with which a financial instrument can be exchanged for cash without a loss in value; market liquidity, which refers to the ability to trade a given volume of assets without significantly affecting their prices; and monetary liquidity which refers to monetary aggregates.[7] The more widely accepted definition of market liquidity characterizes it as a market in which large and fast transactions can be executed with minimal impact on prices.[8] The main elements of a broad concept of market liquidity pertain to width, depth, immediacy and resilience.[9]

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[7] See Muranga and Shimizu (1999) for a survey of different interpretations of market liquidity.
[8] Other definitions can be found in Borio (2000), Inoue (1999), Kyle (1985), Muranaga and Shimizu (1997).
[9] For examples, see Lyons (2001), Madhavan (2000), O'Hara (1995). ***Width*** refers to the size of the bid-ask spreads reflecting the cost of providing liquidity; ***Depth*** refers to the volume of transactions at particular levels of bid-ask spreads and whether they are effected without price changes; ***Immediacy*** refers to the speed with which transactions are effected and whether there are price changes; and ***Resilience*** refers to the speed with which price fluctuations caused by some orders peter out.

21. **Deep and liquid securities markets are important not only for public debt management, monetary policy and overall financial stability, but also for the pricing of financial instruments and market development.** For central banks, indicators for assessing the inflation and output outlooks are derived from the pricing data in securities markets. For the private participants in financial markets, the securities not only serve as risk free investment vehicles but also serve as collateral and benchmarks for pricing fixed income securities, and for hedging interest rate risks. At times, each of the beneficiaries may lack adequate incentives to maintain the sufficient liquidity and therein, lies the rationale for the activist role of governments and central banks in fostering liquidity in financial markets.

22. **A strong welfare argument for the public sector's involvement in the enhancement of market liquidity stems from the desire to ensure that the costs and benefits of liquidity are properly priced by the private sector.** Another compelling reason for public policy interest in market liquidity concerns the positive externalities for debt management and monetary policies. With the externalities accruing to the financial sector and the related enhancement of price discovery, the effectiveness of monetary policy is enhanced.

Main elements of central bank bills and government securities

Central bank bills

23. **Reflecting the assumed strength of central banks' financial position and ultimately, the underwriting of central bank losses of capital by governments, central bank bills are considered to be free from credit risk and share many of the features of treasury bills.** Central bank bills have generally tended to operate on the short end of the money market (maturities that are less than 12 months). As indicated in section II, many of the countries covered in the 2008 ISIMP database survey use central bank bills in conjunction with or as an alternative to government securities for liquidity management. It should be noted that many central banks especially in emerging and developing countries have not built up significant portfolios of government securities and are often not permitted to do so by respective governments.

24. **Some central banks have resorted to own-securities because of the unavailability of appropriate government securities**. The presumption is that if government securities are available in sufficient amounts and there are no legal restrictions on their use for monetary policy, central banks will not need to issue its own securities. The experiences of some former centrally planned economies in the transition to indirect instruments of monetary policy illustrate various circumstances under which the use of central bank bills started.[10] While in the early stages of transition these countries needed to inject liquidity into the banking system, the situation changed to one of having to deal with excess liquidity as foreign exchange inflows increased and banks expanded their loan portfolios thereby

[10] The lessons are drawn from the documentation of the early experiences of the Czech Republic, Hungary, Poland, Slovakia and Slovenia by Krzak and Schubert (1997).

accumulating bad loans. Under these circumstances, open market operations were undertaken to offset the impact of these flows on the monetary base. For many of these countries, government securities were not available in sufficient volumes because with strong fiscal surpluses, governments were less motivated to embark on large treasury bill issuance programs. Without access to treasury bills for liquidity management, affected central banks started issuing their own securities.

25. **Examples of this reaction can be drawn from the experiences of China, Guatemala, Indonesia, Lebanon and Serbia.** In these countries, capital inflows led to defensive issuances of central bank bills to sterilize the impact of the central banks' purchases of foreign exchange as central banks did not have sufficient stocks of government securities to use. More generally, the underlying reasons that explain why some central banks' resort to own securities include:

- The inadequacy of volumes of government securities for the conduct of open market operations;
- The reluctance of some government to issue government securities beyond financing needs and the associated lack of commitment to market development;
- The desire for operational flexibility in monetary operations; and
- Attempts to separate monetary management from debt management.

26. **Central banks need sufficient resources to enable them to carry out their mandates without undermining their balance sheets and autonomy.** Although some central banks have posted profits for many years, many have experienced chronic losses and this may interfere with the implementation of monetary policy and delivery on other central bank mandates.[11]

27. **Large issuances of central bank bills can put a strain on a central bank's balance sheets and lead to losses that undermine its financial position.** For example, in 1998–99, the National Bank of Poland suffered losses amounting to about 0.8 percent of GDP due to sterilization operations through central bank bills. In the early 1990s, other central banks also incurred large losses: Chile (1.4 percent of GDP) and Colombia (0.5 percent to 0.7 percent of GDP), Mexico (0.2 percent to 0.4 percent of GDP). Similarly, the central banks of Indonesia, Malaysia, and Sri Lanka also incurred significant losses because of own paper issuances. Stella and Lonnberg (2008) present graphic evidence of the general decline in the return on assets of a sample of 91 central banks from 1.66 percent during the period 1995–99 to 1.25 percent during the period 2000–04.

[11] See Stella and Lonnberg (2008) for losses of central banks in selected Western Hemisphere countries during the period 1987- 2005. For example, Uruguay's central bank losses average 3 percent of GDP in the late 1980s; central banks of Chile and Guatemala posted losses for almost two decades; Venezuela's central bank made losses for 12 out of 13 consecutive years, and Uruguay's central bank posted losses for 14 consecutive years, while the central bank of Jamaica posted losses for 9 consecutive years.

28. **Some central banks have been subject to fiscal abuse through quasi-fiscal operations and other actions**. When it comes to the Treasury's intervention to address the resultant financial strains on central banks the timing and the arrangements can be cumbersome. As noted in Stella and Lonnberg (2008), some of the financial problems of central banks have come from central banks' issuance of debt. An aversion to the accumulation of an unsustainable debt burden by the central bank would be consistent with the preference to use treasury bills instead of central bank securities.[12]

29. **Whereas the general financial difficulties for central banks might have been more associated with developing countries, potential financial difficulties have also been noted for central banks of some industrial and emerging market countries.** This development can be attributed to the provision of central bank credit to ailing banking systems; increased exposure to revaluation losses in large foreign exchange reserve holdings; the issuance of central bank debt to resist exchange rate appreciation; fiscal abuse of central banks through quasi-fiscal operations; and decreased revenue from inflation tax and seigniorage in an environment of low inflation. Not least important to the surfacing of financial concerns in central bank balance sheets is the increased transparency in reporting and accounting practices.[13] A central bank experiencing financial difficulties suffers a decline in financial independence, which in turn compromises its overall independence. Accountability is a corollary for central bank independence and initiatives such as the IMF's Code of Good Practices on Transparency in Monetary and Financial Policies under the Financial Sector Assessment Program (FSAP) call for increased transparency.

30. **Persistent central bank losses may necessitate recapitalization, which is a charge on public finances.** Heightened interest in central bank capital is closely associated with increased central bank independence in implementing monetary policy and a concern that the lack of financial autonomy can undermine the central bank's ability to deliver on its mandates. Views on the need for central bank recapitalization are varied and there is no universally accepted level of capital that a central bank should hold.[14] However, there is widespread concern that the financial position of a central bank could become a constraint on the fulfillment of its mandate on inflation and other responsibilities. There are divergent views on central bank recapitalization with some suggesting that central bank capital only needs to be non-negative. The views are widely discussed in the literature.[15]

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[12] Elected officials could raise legitimate concerns about a country being committed to unsustainable debt by unelected central bank bureaucrats.

[13] The adoption of International Financial Reporting Standards (IFRS) by some central banks has brought about significant changes in the treatment of valuation gains/losses and profit distribution.

[14] Stella (1997) and Dalton (1999) discuss four ways that central banks have used to determine their own level of capital:(i) an absolute nominal value; (ii) a target ratio to a selected central bank balance sheet item; (iii) a target ratio to some macroeconomic variable; and(iv) according to the perceived risks to the solvency of the central bank.

[15] For example see Stella (1997).

31. **Central bank bills can serve as a substitute for treasury bills and can be particularly useful in post conflict situations where the central bank may be the lone credible official institution.** The opposite could also be true in cases where the central bank has been so fiscally abused that it has all but lost its credibility as the situation experienced in Zimbabwe during the 2000s. The generally positive perceptions of central banks may thus not always hold. Quintyn (1997) notes that central bank paper can be convenient in regional monetary arrangements where the collective central bank can sell its own paper without being constrained by securities of individual governments and respective issuance calendars.

32. **However, there are a number of challenges in the use of central bank bills.** These include: potential conflict with government debt management objectives; limited externalities for overall money market development as participation is often limited to banks,[16] possible weakening of the balance sheet of the central bank and threats to central bank credibility; and also the potential for market segmentation especially if the maturities of paper are similar.

33. **The use of different paper for monetary policy, government financing and/or cash management runs the risk of market fragmentation and the loss of liquidity.** The result is often many series of small issuances, which further hinder the development of benchmark securities. For central banks issuing own securities, a potential conflict of interest arises. As monetary authorities, such central banks would want the market to determine the interest rate for their securities. However, as issuers, they would wish to minimize their costs and this desire often results in their interfering with price determination.[17]

34. **One way to address the problem of fragmentation is for the government to issue additional treasury bills as an add-on to normal auctions and sterilize the proceeds in a special account.** Such add-ons to treasury bill auctions add to the central bank's access to securities needed for market intervention (IMF and World Bank, 2001). This is especially the case in cases where the range of market intervention instruments is limited or nonexistent. The add-ons are issuances over and above the budgetary financial needs and are specifically for supporting liquidity management. This instrument fosters market development but also raises additional budget costs, and requires the sterilization of proceeds from it and coordination between liquidity and debt management policies.

35. **Without transparency, add-ons could confuse the market as participants will not know which portion of a tender is being used for budget financing or monetary policy.** However, such confusion can be eliminated by the announcement of central bank add-ons and limiting securities for monetary policy to the short end maturity spectrum. Furthermore, the transactions for monetary policy can be limited to a select group of financial institutions and the proceeds should be held in a blocked account that is unavailable for use by the

[16] One rational for limiting participation to commercial banks or those entities holding reservable deposits is that the impact on the reserves is direct and more assured. It should be noted though that ultimately the impact on reserves is the same.

[17] For example, a World Bank study (2006) found that before 2004, both the Croatian Ministry of Finance and the Central Bank issued their own paper but for similar maturities, the discount for treasury bills was 8 percent while that for central bank bills was only 1 percent.

government. There is also the further challenge from the potential conflict between debt management objectives and monetary policy objectives. For example, the interest costs of treasury bills used for liquidity absorption increases budget costs. If not carefully coordinated and managed, such situations can undermine the operational autonomy of the central bank and, with it, the effectiveness of monetary policy. For example, during the 1980s, an agreement between the Philippines Treasury and the central bank initially permitted add-ons and froze the proceeds but the Treasury subsequently resisted the issuing of the full amounts of add-ons required by the central bank and insisted on a modification of the original agreement to freeze the proceeds.

36. **Apart from add-ons, two additional ways in which a central bank can obtain additional government securities are the conversion of existing central bank loans to securities and recapitalization of the central bank.** The later was effected in the Philippines in 1993 and in Uganda in 1999. Both ways present challenges, which may lead to objections by governments. For example, the existing loans may be below market rates and converting them to treasury bills implies higher costs.

37. **Annex II presents a stylized scheme for the requisite coordination between monetary operations and debt management.** While institutional details will differ, the essence of the stylized scheme is to underscore the imperative for effective collaboration between debt management and monetary operations. The Bank Fund debt management guidelines present the main objective of debt management as ensuring that the government's financing needs and its payment obligations are met at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk; however, the need for consistency with monetary policy is also critical.[18] With appropriate maturity structures and handling of proceeds, the use of the same instrument for both debt management and monetary policy avoids market fragmentation and strengthens the role of government securities as a tool for market development.

38. **In a bid to separate debt management from liquidity management, consideration has been given to possible alternatives such as private paper and auctioned interest-bearing deposits.** While there has been a surge in private paper over time, its use for monetary policy has been limited even among industrial countries. Quintyn (1994) cites Indonesia as a rare exception where the central bank used its own debt instruments as well as private paper in open market operations. Among industrial countries, Japan has used private paper but experienced some problems of default in 1997.[19] In any case, private paper is not used for liquidity draining operations.

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[18] This consideration is clearly articulated for example in the United Kingdom Debt Management Office's characterization of its debt management as follows: "to minimize over the long-term, the costs of meeting the Government financing needs, taking into account risk, whilst ensuring that debt management policy is consistent with the aims of monetary policy."

[19] Yaohan, a large retailer defaulted on its publicly traded bonds and several Japanese banks followed suit.

39. **While potentially serving the same purpose as central bank bills, auctioned deposits are not marketable and thus do not contribute to market development.** Like central bank bills, the auctioned deposits also require coordination and invariably impose a direct financial burden on the balance sheet of the central bank and indirectly on the overall government budget. Furthermore, the extent to which an additional financial burden on the central bank can be imposed sets a limit to the amount that can be available in this instrument. Generally where the deposit facility is used for liquidity absorbing operations, the rates tend to be the lower bound in the case of interest rate corridors.

40. **In situations where central banks use own securities, it is critical that such paper avoid fragmenting the market, be on the short-end of the maturity spectrum, be closely coordinated with debt management objectives and not undermine the financial position of the central bank.** One way to avoid such fragmentation would be for the maturity profiles to be different with central bank bills concentrating on the short end of the market while treasury bills concentrate on the longer end. Coordination is also important otherwise there could be instances where attempts to absorb liquidity are negated by injections from redemptions of some securities. Many central banks in countries where there is already a T-bill market do not use central bank bills, although there are exceptions. When the modalities of the central bank bills and the treasury bills are identical, market fragmentation could be less of an issue.

41. **The main advantage of having a central bank bill program is the autonomy it accords the central bank in controlling excess liquidity without relying on the government issuance program**. Of course, the disadvantage is that the interest costs are borne by the central bank, and these could be large when there is a lot of liquidity to absorb and rates are high.

Treasury bills

42. **Historically, government securities have been associated with many positive externalities for the financial sector and the rest of the economy.**[20] At a more general level, the stylized features of government securities include:

- being regarded as virtually free from credit risk;[21] acting as a tool for hedging interest rate risks and as underlying assets and collateral for related markets such as repo, futures and option markets;

[20] This in part, explains the well documented concern with the decline in treasury securities that was observed about 10 years ago when the U.S. and many other countries started reducing the stock of treasury securities as a result of stronger fiscal positions [Schinasi et al (2001), BIS (2001), BIS (2000), McCauley (2001) and Zelmer (2001)]. In the late 1990s, government securities declined fastest in Australia, Canada, Sweden, the United Kingdom, the United States, and other industrial countries with fiscal surpluses. The size of the euro-denominated securities market was sustained by fiscal deficits in France, Spain, and other euro area countries. At the same time, large fiscal deficits in Japan produced a large government securities market.

[21] Short-term treasury bills are free of price risk and inflation-indexed securities are free of inflation risk, rendering them a safer store of value than even cash.

(continued…)

- serving as a benchmark in pricing for other financial assets[22] as well as for extracting information on inflation and output outlook; and

- liquidity being concentrated in a few key maturities.

43. **It is for these features that government securities are the most natural candidate for the core financial market**. However, not all of these features are present in government securities of all countries at all times. Instances of near or actual defaults and the attendant credit ratings bear testimony to this reality.[23] Nonetheless, government securities have been at the center of the global financial system because they usually represent the most creditworthy obligations in the national economy.

44. **Despite earlier concerns about potential reductions in the stock of government securities as fiscal positions improve and some aversion to over funding sets in, the experiences of Hong Kong, Singapore, and Australia demonstrate that the government securities markets can be created through the accumulation of assets (MaCauley, 2002).**[24] In a similar effort, the U.K. sought to maintain new issuance volumes in the bond market during a period of fiscal surpluses by allowing its holdings of financial assets to rise temporarily when it received an unexpectedly large injection of cash from the sale of mobile phone licenses.

45. **The role of government bond markets remains pivotal in virtually all of the major economies**. By providing benchmarks with negligible or predictable risk premia and being useful in assessing market expectations of future short-term interest rates, government securities form the basis for developing risk-free yield curves. The interest rate on risk-free assets effectively provides an anchor for the pricing of financial assets. The government yield curve has typically served as a proxy for the risk-free rate. While private instruments such as collateralized obligations (until recently) and interest rate swaps also have the potential to serve as risk-free benchmarks, they lack certain unique features associated with government securities. These are:

- perception of high creditworthiness and being virtually risk free;

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[22] The performance of many investments was often judged against hypothetical portfolios of government bonds and the tendency to consider spreads against government bonds was further encouraged by the use of government bonds to hedge positions in non-government securities.

[23] Examples of near defaults that were avoided include Pakistan in 1999; Ukraine in 2000, Moldova in 2001; and Uruguay in 2003. Examples of actual defaults include Argentina in 2001, Russia in 1998, Ecuador in 1999, and Ivory Coast in 2000 (Fabozzi, Frank and Steven Mann, 2005, p. 454–459).

[24] The Hong Kong Monetary Authority and the Singapore government issued bills and notes in an effort to build a government yield curve to serve as a base for the pricing of corporate issues and swaps etc. They also built up foreign asset holdings which were split into liquidity and investment portfolios. The Australian government deposited its proceeds from the sale of Telstra with the Reserve Bank of Australia, which in turn swapped the proceeds into foreign exchange.

- the presence of high volumes of outstanding and fungible issues that facilitate trading and with the most recently issued of them (on-the-run) being more liquid than private paper;

- the ability of government to cater for a wide range of risk appetites and maturity profiles; and

- the existence of well-developed repo and derivatives markets for government securities, which enable market participants to take short and long positions that reflect their views of future interest rate movements.

46. **When government securities markets were less developed, private sector debt instruments were used to assess market expectations of future short-term interest rates and inflation.**[25] This confirms that to function as an efficient proxy for risk-free interest rates, a financial instrument does not have to be risk free. Further confirmation of this can be derived from the fact that there have been instances of government defaults and credit ratings of governments are occasionally downgraded. The determination of the risk-free rate only requires that the risk premia embedded in forward rates be predictable. It should be noted though that issuers can employ various mechanisms to demonstrate their resolve to maintain the quality of their assets.[26] Even with all these possibilities, the emergence of a market consensus that elevates the status of bonds issued by a particular private entity to that of a risk-free benchmark remains elusive.

47. **In the major debt markets, interest rates in the general collateral repo market are already widely regarded as the most efficient proxy for risk-free rates at very short maturities [CGFS (1999)].** Government securities stand out among risk-free instruments that have been used as the underlying collateral in repo transactions. Repo markets are typically liquid out to about 3 months (12 months in the U.S.), and expectations extracted from them serve monetary policy well. Repo rates have thus displaced government yields at the very short end of the yield curve. However, beyond the short-term, expectations extracted from the term structure of repo rates may not be accurate for the broader collateralized debt market that extends out to 30 years or more. The market would save on resources if price discovery about macroeconomic fundamentals is concentrated in only one homogeneous instrument.

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[25] In the 1950s and 1960s, market participants in the U.S. dollar market referred to bonds issued by top-grade corporations, such as American Telephone and Telegraph, to gauge expectations of future interest rates. Contemporaneously, in Japan, bank debentures and bonds issued by Nippon Telephone and Telegraph effectively served as risk-free benchmarks. These bonds were not necessarily default-free instruments, but at the time the stable nature of the issuer's business activities limited the volatility of any associated credit spreads.

[26] For example, bond covenants might restrict significant alterations in the operational or financial risk characteristics of a firm, or coupon payments might be linked to the issuer's credit rating.

IV. Issues to Consider in the Choice Between the Securities

48. **In an era of increased central bank autonomy and independence, it is critical that the conduct of monetary policy be unconstrained by factors that could undermine the central bank's ability to deliver on its mandate.** Not only should the central bank be accorded a stream of income to finance its operations but it should also enjoy financial independence. There has been a general trend for central bank statutes to be strengthened with a view to giving more prominence to central bank independence, transparency and accountability. This development provides a foundation and support for the active use of indirect instruments of monetary policy.

49. **Financial relationships between the central bank and the government have important implications for the autonomy of the former**. Financial autonomy of the central bank manifests itself in three broad ways: (i) possessing the latitude to set the terms and conditions for items in its balance sheet; (ii) having the resources to cover operational expenses and losses; and (iii) having in place clear rules that govern the distribution of profits, and the accumulation of capital and reserves. Many developments in the transition to indirect instruments have laid the foundation for some of the required autonomy. Examples of such developments include: the explicit prohibition on central bank lending to the government; and the elimination of explicit or implicit subsidies to the government. The prohibition on direct lending to the government has motivated governments to develop local money and securities markets as sources of finance.[27] Some central banks and finance ministries have developed Memoranda of Understanding (MOUs) to guide interactions between them. This is meant to strengthen collaboration and ensure efficient implementation of policy.

50. **As indicated in Section II, the use of central bank securities is quite widespread among developing and emerging market economies, some of whom also use treasury bills as well**. In contrast, the incidence of use of central bank securities in industrial countries is quite low.[28] It is worthwhile noting that industrial countries generally seem to have been ahead of the curve in terms of attaining central bank independence and autonomy. Furthermore, industrial countries generally grapple with the need to supply liquidity as opposed to draining liquidity from the system, for which they would need such securities.

51. **The decision on the choice between using government securities or central bank bills should benefit from a recognition that the costs of sterilization can be borne directly and in a transparent manner through the government budget or indirectly**

[27] Many developing countries have relied on external financing but have also realized the need to for domestic sources of finance and to that end, started initiatives to develop domestic securities markets, which will not only address financing needs but also develop money markets and strengthen the operational basis for indirect instruments of monetary policy.

[28] The central banks of Denmark and Sweden conduct transactions in central bank securities to influence market liquidity and often conduct repos on the basis of these securities, IMF and World Bank, 2002, p. 83).The Reserve Bank of New Zealand uses a combination of primary issues of central bank securities, outright transactions in government and central bank securities and repos on the basis of both securities.

through the balance sheet of the central bank where they can have perverse effects on the effectiveness of the central bank. Such impairment of the central bank's balance sheet may necessitate the injection of capital by the government. The bottom line is that in the consolidated public sector, the government bears the costs either directly by recognizing them as a budget entry or indirectly through (i) reduced profit transfers from the central bank; or (ii) increased budget outlays to meet central bank losses or inject capital. Ultimately, the decision of which instrument to use should be guided by institutional arrangements and assurance that objectives will be met without undue constraints.

52. **Specifically, the choice between government securities and central bank paper should be guided by the extent to which they: (i) facilitate the transmission of monetary impulses; (ii) assist in the development of liquid markets; and (iii)ensure operational independence for the central bank.** It is important that the central bank be unconstrained in pursuing its objectives. Constraints can stem from the lack of autonomy, a significant contributory factor to which can be a weak financial position. Relying on own debt instruments can weaken the balance sheet of a central bank and the situation can be even more complicated if the framework and timing of government financial support are not clear. The development of liquid debt markets can be viewed as a public good whose benefits outweigh the costs.

53. **Open market operations, the linchpin of market based monetary operations depend importantly on the establishment of liquid securities markets with appropriate maturities.** The development of vibrant securities markets has positive effects for the development of other financial instruments. In particular, treasury bills enjoy features that make them an ideal vehicle for the development of markets. They facilitate the development of yield curves that are critical for the conveyance of monetary policy signals. The successful emission of policy signals reflects an enhancement of monetary transmission channels.

54. **In shallow markets where secondary markets are not yet in place, treasury bills are the preferred instrument because of the large volumes that can facilitate the catalytic role they play in fostering the development of markets**. However, failure to recognize where the ultimate responsibility for the cost of monetary operations lies can lead to a reluctance of some governments to issue treasury bills if there is no financing need.

55. **Fiscal surpluses, the availability of alternative sources of financing and concern about budget costs can be reasons for a government's reluctance to issue government securities**. While government concerns about costs are understandable, it should be recognized that securities issuances even in times of fiscal surpluses not only promote market development but also can serve as a useful barometer of market perceptions on the soundness of the government's macroeconomic policies. To the extent that perceptions are positive, this should translate into substantially lower costs of government borrowing if and when the need to borrow domestically arises.

56. **For all the positive attributes commending their use for liquidity management in addition to their traditional role (debt management), treasury bills should not be overburdened with multiple objectives**. In addition to debt management, treasury bills can be an effective instrument for the management of structural excess liquidity. They would not

serve well for fine-tuning as liquidity forecasting errors would feed directly into volatility in the entire yield curve and thereby contaminate the whole interest rate structure. Instead, short-term instruments such as repos with maturities of one to two weeks should be used to fine-tune short-term liquidity in the banking sector. Errors in forecasting liquidity will in that case only feed directly into the short-term money market rates (one-week or two-week rates, depending on the maturity of the liquidity management instrument). Volatility in short-term interest rates should normally not significantly influence longer-term money market rates or lending rates. Longer-term money market rates should to a greater extent reflect expectations about future short-term interest rates.

57. **As suggested above, government securities serve as benchmarks for other financial instruments such as commercial paper, asset-backed securities, and corporate bonds, and there by strengthens financial intermediation and stability.** Investors demand for liquidity premiums tends to be high when markets are not liquid. The development of a liquid secondary market helps to lower funding costs for governments and thus mitigates some of the inherent conflict between debt management and monetary operations.

58. **The use of treasury bills would be helpful in: i) insulating of all sterilization operations from normal day-to-day liquidity management; (ii) reducing and/or eliminating volatility, which can contaminate the whole spectrum of interest rates; (iii) making effective use of short-term instruments for fine-tuning; and (iv) developing benchmark issues to pave the way for a vibrant secondary market.** The structure of the treasury bill market should be designed with a view to sterilizing the structural liquidity of the banking sector in the cheapest possible way and contributing to the development of markets.

59. **Where government securities are not available for monetary policy, the central bank needs to have a strong enough balance sheet to issue its own bills and service the interest costs**. However, it is rare to find a central bank with a solid balance sheet in a country with a weak fiscal position. An exception would be a central bank that owns the country's international reserves and is independent enough to control the earnings on these reserves. A case could be made for allowing a central bank to buy limited amounts of treasury bills at every government auction in order to build a stock from which it could derive an income. However, such purchases should be transparent and announced in advance. Over time the central bank would hold a portfolio of bills of different maturities, giving it great flexibility for OMO repo operations.

60. **As noted in Section II, a significant number of countries that participated in the 2008 survey for the ISIMP, use both treasury bills and central bank bills**. In addition to the regular coordination issues between monetary and debt management policies, such situations present additional challenges pertaining to market fragmentation, determination of volumes and issuance procedures and terms, and maturity profiles. A case for the consolidation of all public debt under one obligor could be made. Such a set-up has the advantage of eliminating possibilities of debt management and monetary operations negating each other. It also removes the market fragmentation and ensures that maturity profiles are targeted appropriately to meet the respective needs of debt management and liquidity management. The issuance of similar maturity profiles may contribute to market

fragmentation and may lead to differential market assessments of instruments that essentially have the same features.[29]

The case for treasury bills

61. **An integrated perspective of the public sector, the promotion and development of money markets and positive externalities for the whole economy are factors that contribute to a stronger case for the use of treasury bills over central bank bills.**

Integrated public finance perspective

62. **The allusion to treasury bills being the first best option for liquidity management is premised on an integrated view of public finance according to which the tax payer has the ultimate responsibility over losses incurred by the central bank.** The integrated view of the public sector considers the overall financial position of the central bank and the government as an integral whole. Accordingly, losses posted by the central bank and any need for recapitalization are a charge on public accounts and by extension, the tax payer. In simple terms, the consolidated public sector could be presented as shown in Annex II. Governments can choose to recognize the cost of sterilization operations explicitly in their budgets or indirectly in the balance sheets of the central banks where it can result in reduced profit distribution to the government and/or losses that impair the balance sheet of the central bank and may give rise to the need for recapitalization.

63. **Central bank losses interfere with the conduct of monetary policy and the ability of the central bank to deliver on other mandates.** It is particularly challenging if these losses are an outcome of the central bank's having had to issue its own securities in order to absorb excess liquidity. The continued issuance of central bank debt may result in unsustainable debt for the central bank and further add to public debt. It would be ideal to bring all public debt under a single obligor where the issuance can be better coordinated to cater for the various maturity profiles. This would have the advantage of avoiding competition and market fragmentation, thereby improving the requisite coordination between monetary policy and debt management. Regardless of whether central bank or government securities are used, the inherent conflicts between debt management and monetary policy still need to be managed.[30]

64. **An independent central bank would be particularly mindful of its net worth. To safeguard its independence, there needs to be some clarity in the guidelines pertaining to accounting practices, transfer of profit, coverage of losses and recapitalization.**[31] The

[29] Korea experienced differential pricing between a two–year monetary stabilization bond and a three-year treasury bond. The monetary stabilization bond traded nearly 20 basis points above the treasury bond but both enjoyed the same explicit guarantee [Jeanneau and Tovar (2008)].

[30] Annex II present a stylized structure of institutional arrangements for monetary and debt management.

[31] Stella and Lonnberg (2008) note that the concept of central bank financial strength has been questioned on the grounds that a central bank can create money and has the backing of the treasury. They find the notion of the inextricable intertwining of central bank and treasury finances prevalent in U.S. official circles.

(continued…)

arrangements may need to be formalized in an MOU between the central bank and the ministry of finance especially in situations where there are underlying tensions between the two institutions. Some anecdotal information seems to suggest that IMF missions are often an opportunity for more comprehensive dialogue and information exchange between central banks and ministries of finance in some countries. This suggests that underlying tensions can be strong and do weaken the scope for much needed collaboration between the two institutions.

65. **Bindseil et al (2004) take the notion of integrated public finance further and construct a model based on the strong assumption of a "liquidity unconstrained" central bank**.[32] The absence of a liquidity constraint is premised on the notion that the central bank maintains the right to issue legal tender over an infinite horizon. The construct is used to illustrate the conditions under which a given level of capital, low or negative, would not have harmful effects on the ability of the central bank to achieve its monetary policy objective. In its simple and restrictive form, the model does not confirm the empirical evidence regarding the negative correlation between inflation performance and the financial strength of the central bank. Under restrictive assumptions, the model leads to the conclusion that a temporary shock creating negative capital and central bank losses is reversed in the long run as the central bank returns to profitability and a positive level of capital.

66. **The U.S. General Accounting Office failed to find either widely accepted or analytically based criteria to show whether a central bank needs capital as a cushion against losses and how the level could be determined; such failure resonates with other analysts' conclusions.** This raises important questions as to what the level of a central bank's capital should be and whether this can hamper monetary operations. Buiter (2006) and Goodhart (1999) lend strong support to the integrated public finance view by arguing that the taxing power of the state stands behind liabilities of the central bank and that when monetary policy is institutionally delegated to the central bank, the treasury has to stand behind the central bank. While it could be argued that automated and reliable rules for recapitalization or covering of central bank losses can be regarded as a substitute for non negative capital, in practice, the automaticity often does not take place.

67. **Whether various governments actually provide backing to the central bank and what forms it takes is an empirical matter that is circumscribed by legal and institutional traditions**. Moreover, many central banks do not have unambiguous legal provisions regarding the treatment of losses but invariably provide rules for the distribution of profits. Drawing on 135 central bank statutes to establish country practices regarding the support of central bank finances by the treasuries, provisions for recapitalization and guidelines on the distribution of profits, Stella and Lonnberg (2008) find divergent practices among countries and note the bimodal distribution of practices. One group explicitly recognizes treasury responsibilities for central bank finances, while the other group takes the opposite position that neither of the two institutions should have financial responsibility for the other. It thus cannot be generally concluded that government stands behind the central

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[32] This assumption can be questionable in situations in which the value of the legal tender collapses due to hyperinflation and dollarization, reflecting the rejection of a local currency such as has happened in Zimbabwe recently.

bank's finances and by extension it has to be presumed that the central bank's financial position is important for the assurance that the bank can deliver on its mandate.

Promoting the development of money markets

68. **To the extent that efficient financial markets help in allocating and transferring economic resources across time and space in an uncertain environment, their absence implies a welfare loss for society.** Episodes of financial crises have given much impetus, in both academic and policy circles, to the development of domestic securities markets. These endeavors have been enriched by the pioneering work of Goldsmith (1965) and the insights of Shaw (1973) and McKinnon (1973), as well as those of many others after them. Much of the concern stems from the perception that the absence of bond markets made several Asian economies more vulnerable to financial crisis (Herring and Chatusripitak 2006).[33]

69. **The existence of deep and liquid financial markets is a matter of public policy interest for financial sector stability, the conduct of monetary policy and debt management**. While market liquidity may not meet the strict criteria of a pure public good, the positive externalities that it generates for the financial sector and the rest of the economy argue for public policy directed at enhancing liquidity.[34] The markets benefit governments, central banks, public entities, private entities and households.[35] There are many interrelated actors and institutions in developing financial markets and Figure 3 depicts the situation where market development is at the center and linked to various elements that help to bring it about. Annex IV also shows the interrelationships among various agents contributing to market development and the relationships among bond and money markets and monetary policy.

70. **The integration of debt and money markets is the bedrock for a vibrant market.** The money market provides banks the primary mechanism through which to adjust intraday liquidity and finance for their inventory of securities. For financial authorities, such a market offers a way of meeting government financing needs in a noninflationary way through primary market issuance while strengthening the monetary policy transmission mechanisms and enhancing the efficiency and stability of financial markets. A well-functioning money market can be characterized as one where participants can deal with one another in meaningful amounts without large price changes and offers and where borrowers and lenders are a reliable source of financing or investment opportunity. This market should be supported by market determined interest rates and sound regulatory and institutional infrastructure. This in turn lays the foundation for a liquid secondary market.

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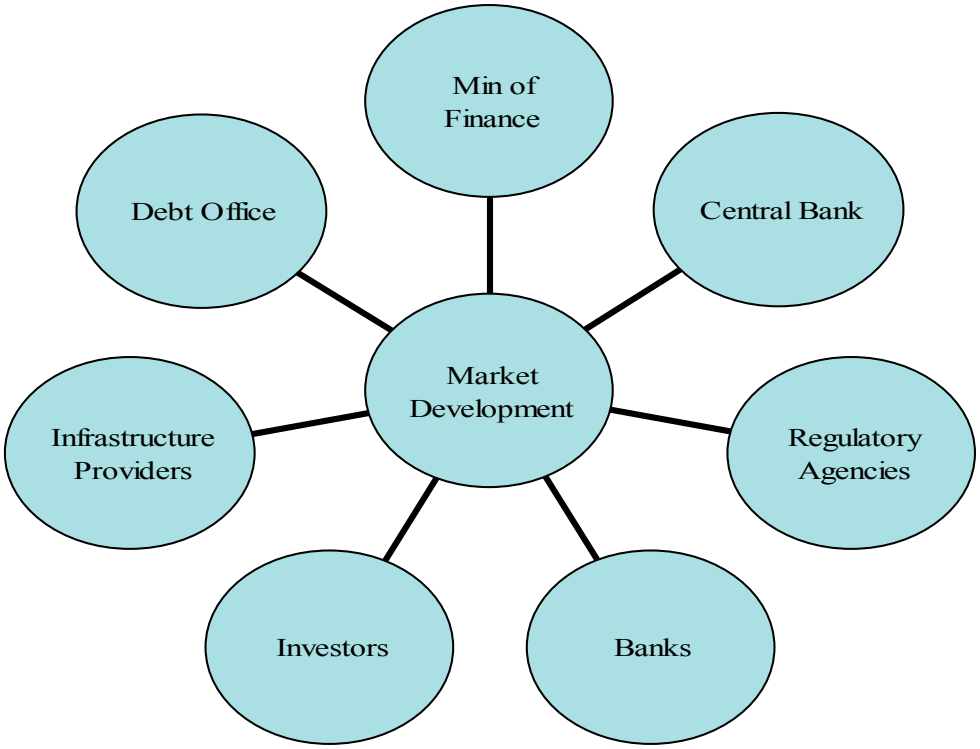
[33] The Governor of the Bank of Thailand (Sonakul (2000)) reflected this view when he observed, "If I [could] turn back the clock and have a wish [list]…high in its ranking would be a well-functioning Thai baht bond market."

[34] Depending on whether the analysis is limited to market participants or includes the rest of the economy, market liquidity may or may not be excludable.

[35] See Castellanos (1998) for a detailed discussion of these.

71. **Market liquidity generates positive externalities for the financial system as well as the rest of the economy.** In this setting, government securities become a reference point for the pricing of other financial instruments and the management of risks. Government securities which are the key instrument discussed in this paper should be viewed in a continuum of maturity spectrums. This includes treasury bills typically with maturities of 12 months or less and medium and long-term notes and bonds. Apart from positive externalities, the need to correct for market failures that could interfere with the extraction of all the social benefits is a justification for public policy involvement in market development. In such a setting, external costs and benefits of market liquidity would be properly priced. Without such a market the economy would not have a market-determined term structure of interest rates. The lack of a term structure inhibits the development of derivatives markets and the ability of economic agents to manage financial risks and price credit risks. Economic agents will be exposed to more financial risk than they would choose to accept if they had access to well-functioning derivatives markets.

Figure 2. Agents for Money Market Development



72. **Other negative factors associated with the absence of deep and liquid markets include**: a diminished range of assets for savers; ii) possible financial disintermediation; iii) loss of welfare to savers who are less well-off than they would be with the option of investing in a wide range of financial assets; iv) a loss of information contained in market determined interest rates; v) lack of a clear measure of the opportunity cost of funds often leading to overinvestment if the firm's internal rate is too low or underinvestment if the firm's internal rate is too high; vi) dominance by banks, which would take advantage of customers by offering low deposit rates because of lack of competition; vii) vulnerability to crisis due to excessive reliance on bank lending from highly leveraged institutions; and viii)difficulty in securitizing non-performing loans so that resources can be redeployed as rapidly as possible to restructure the economy.

73. **The value of the information content of fixed income instruments can be appreciated by conceptually separating out the yields into premiums for**: (i) the loss of purchasing power and uncertainty of future prices (inflation premium); (ii) the willingness to wait for payment (term premium); and (iii) other risks specific to the financial instrument used (credit spreads). Inflation and term premiums reflect expectations about the future prices and the value society attaches to inter-temporal resource transfers across time. These two premiums are common to all financial transactions of the same maturity. Credit spreads

are specific to an issuer and reflect credit quality and specifications of the contract. The yields in financial markets provide a single measure that reflects all three premiums. The secondary market for securities issued by entities with strong credit tends to have enough liquidity and have contracts that are standardized. This is where government securities beat the competition in becoming the benchmark for fixed income securities of similar maturity. Government securities markets play a catalytic role that increases trades in other securities and fosters financial innovation. The broader externalities for other economic agents can be better appreciated when one steps out of the narrow and traditional view of government securities merely as a source of finance for budget.

Positive externalities for the whole economy

74. **The positive externalities associated with government securities accrue to government, central banks, financial systems, public enterprises local governments, businesses and households (Annex V).** Taking the whole spectrum of maturities, government securities establish a benchmark yield curve that helps to establish the overall credit curve and enable the effective use of market based instruments of monetary policy. Government securities markets can effectively meet the financing needs of government and in the process, reduce the burden of external finance if it is on high terms and enhance the transmission and implementation of monetary policy. The market enables governments to smooth consumption and investment expenditures to deal with shocks and if combined with sound debt management, can also reduce exposure to interest rate, currency and other risks.

75. **Government securities disseminate information (a public good) on inflation expectations and term premiums**. They provide an anchor to the notion of a riskless asset and become the benchmark for all other fixed income securities of similar maturity. Their prices do not suffer from noise brought about by credit spreads, which reflect a borrower's credit quality or specific contracts pertaining to the loan. The universal acceptance of this can be inferred from the tendency to calibrate the riskiness of other financial assets by how much extra yield they must offer relative to treasuries. As a benchmark, the securities become the important standard for valuation of all financial contracts. The combination of the inflation and term premiums, devoid of noise from spreads is the most basic discount factor they provide.

76. **Government securities issuance programs provide opportunities for markets to express views on the overall macroeconomic performance and policies as reflected in the level of discounts**. A government's commitment to the lowering of its funding costs provides incentives for prudent policies which are rewarded with lower funding costs. By serving as a hedge for the risk of illiquid securities, government securities increase liquidity in related markets. The hedge increases the availability of the original instrument and this increases its liquidity.

V. CONCLUSIONS

77. **On the whole, the choice between treasury bills or central bank bills should be guided by the extent to which they ensure operational independence for the central bank, assist in the development of liquid markets and facilitate the transmission of**

monetary impulses. As argued in this paper, treasury bills stand out as the first best option security to use for both debt and liquidity management. Strong support for this view can be derived from: (i) an integrated view of public sector finance; (ii) the public policy argument for the government's role in fostering the development of money markets; and (iii) inherent features that enable government securities to generate positive externalities for other financial instruments and the rest of the economy in a way that is not easily replicable by other instruments.

78. **In practice many countries, especially emerging and developing ones use central bank bills and/or treasury bills especially to deal with chronic surplus liquidity**. For such countries, the challenges have to do with possible market fragmentation, and relations between central banks and ministries of finance, especially when the former suffer operational losses and the need for recapitalization. Institutional arrangements including memoranda of understanding can support these arrangements and enable central bank securities to function just as well as government securities in absorbing excess liquidity.

79. **While government securities have their traditional role in debt management, they have successfully taken on a dual role in many country settings.** Typically, paper for liquidity management concentrates on the short end of the market and can take the form of add-ons or special issues over and above financing needs. The bidding process for such securities is typically limited to commercial banks or the central bank's regular counterparties in open market operations. While an appropriate variety and timing of such issues may exist, what is critical is that the overall issuances and redemptions are coordinated so that intended objectives are not negated. For liquidity absorbing operations, it is critical that the proceeds from treasury bills used for this purpose be kept in a frozen account and thus not available for government expenditure. Even in cases where government securities are not used for monetary policy purposes, there is always going to be the need for the close coordination between debt management and monetary policy and therefore close for close coordination between the central bank and the ministry of finance.

80. **The use of treasury bills would be helpful in**: (i) insulating all sterilization operations from normal day-to-day liquidity management; (ii) reducing volatility, which can contaminate the whole spectrum of interest rates; (iii) making effective use of short-term instruments for fine-tuning; and (iv) developing benchmark issues to pave the way for a vibrant secondary market. In addition, the effectiveness of treasury bills requires a commitment to a regular issuance schedule at appropriate maturities. The structure of the treasury bill market should be designed with a view to sterilizing the structural liquidity of the banking sector in the cheapest possible way and to contributing to the development of markets. Notwithstanding the strong argument for selecting government securities as a first best option, the choice between using treasury bills or central bank bills depends on individual country circumstances.

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Annex I. Relative Advantages and Disadvantages of Using Government Securities or Central Bank Securities

	Advantages	Disadvantages
Government securities	• Their use for primary market operations helps the development of a viable market, which in turn will stimulate financial markets in general and transmission of monetary policy. • Shifts cost of monetary tightening to government and makes it transparent in the budget. May encourage fiscal discipline on the part of the government, if direct central bank financing is discontinued.	• Requires high degree of coordination between central bank and treasury; • If not properly coordinated with treasury, the central bank's operational autonomy may not be guaranteed and primary market interventions may not be effective.
Central Bank Securities	• Facilitate the central bank's operational independence (provided their issuance is coordinated with that of government securities). • Flexible instrument for liquidity management.	• May, under certain conditions, reduce central bank profits or lead to central bank losses if issued in large amounts. • Requires some degree of coordination with treasury to avoid small and segmented markets.
Auctions of Central Bank Deposits	• Guarantees the central bank's operational independence and avoids competition with treasury securities.	• Does not assist in developing securities markets (unless they are negotiable, but then they are similar to central bank securities).

Source: "Monetary Policy Through Primary Market Issues: Government Securities or Central Bank Securities?" MAE Operational Paper, MAE OP/96/5, December 1996.

ANNEX II. A REPRESENTATION OF THE INTEGRATED BUDGET FRAMEWORK[36]

Printing base money y = consolidated foreign and domestic net borrowing = consolidated budget deficit + interest payments on outstanding consolidated net debt + central bank credit to the economy + acquisition of foreign assets and other net assets by the government and central bank.

$\Delta RM + (\Delta GDD + \Delta CBB - \Delta GNFA - \Delta CBNFA) = GOE + CBOE - T) + rdGDD + rbCBB - \eta\, GNFA - \tau\, CBNFA - \Psi\, GONA - \lambda\, CBONA - reCBCE + \Delta CBCE + \Delta GONA + \Delta CBONA$

Where: ΔRM = change in the stock of base money (RMt-RMt-1);

ΔGDD = change in the a(mx1) vector of outstanding government domestic debt instruments outside the central bank;

ΔCBB = change in the stock of central bank bill or bond;

$\Delta GNFA$ = change in the a(1xm) vector of outstanding government net foreign assets valued in local currency;

$\Delta CBNFA$ = change in the stock of outstanding central bank foreign assets valued in local currency;

GOE = Total government expenditure;

T = Taxes;

rd = a (1xm) vector of nominal interest rates on government domestic debt instruments outside the central bank;

rdGDD = interest on government domestic debt instruments outside the central bank;
rb = a(1x m) vector of nominal interest rates on central bank bonds or bills;

rbCBB = interest earnings on stock of central bank bills or bonds;

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[36] Adapted from Leone (1991). Many analysts use a similar framework. Examples are Gartner Manfred (1997) ,and Fischer and Easterly (1990). The latter examine three key relationships: national income accounts budget identity, the deficit financing identity and the dynamic equation for the evolution of the ratio of to gross national product. With these, they demonstrate different types of macroeconomic imbalances that deficits can cause: (i) printing money shows up as inflation; (ii) excessive use of foreign reserves leads to crises in the balance of payments; (iii) high foreign borrowing leads to a debt crisis; and (iv) too much domestic borrowing leads to high real interest rates and possible crowding out of private investment. The debt dynamics essentially show the long-run constraints on fiscal policy.

η = a (1xm) vector of the local currency equivalent of nominal international interest rates on government net foreign assets;

η GNFA = interest earnings on government net foreign assets valued in local currency;

τ = a (1xm) vector of the local currency equivalent of nominal international interest rates on central bank net foreign assets;

τ CBNFA = interest earnings on central bank net foreign assets valued in local currency;

Ψ = a (1xm) vector of nominal interest rates on other net government net assets;

GONA = a (1xm) vector of outstanding other net government assets;

Ψ GONA = interest earnings on outstanding other net government assets;

λ = a (1xm) vector of nominal interest rates on other outstanding central bank net assets;

CBONA = a (1xm) vector of other outstanding central bank net assets;

λ CBONA = interest earnings on other outstanding central bank net assets;

re = a(1xm) vector of nominal interest rates on outstanding liabilities of the economy with the central bank;

CBCE = a (1xm) vector of other outstanding debt instruments of the economy (banks and private sector) with the central bank;

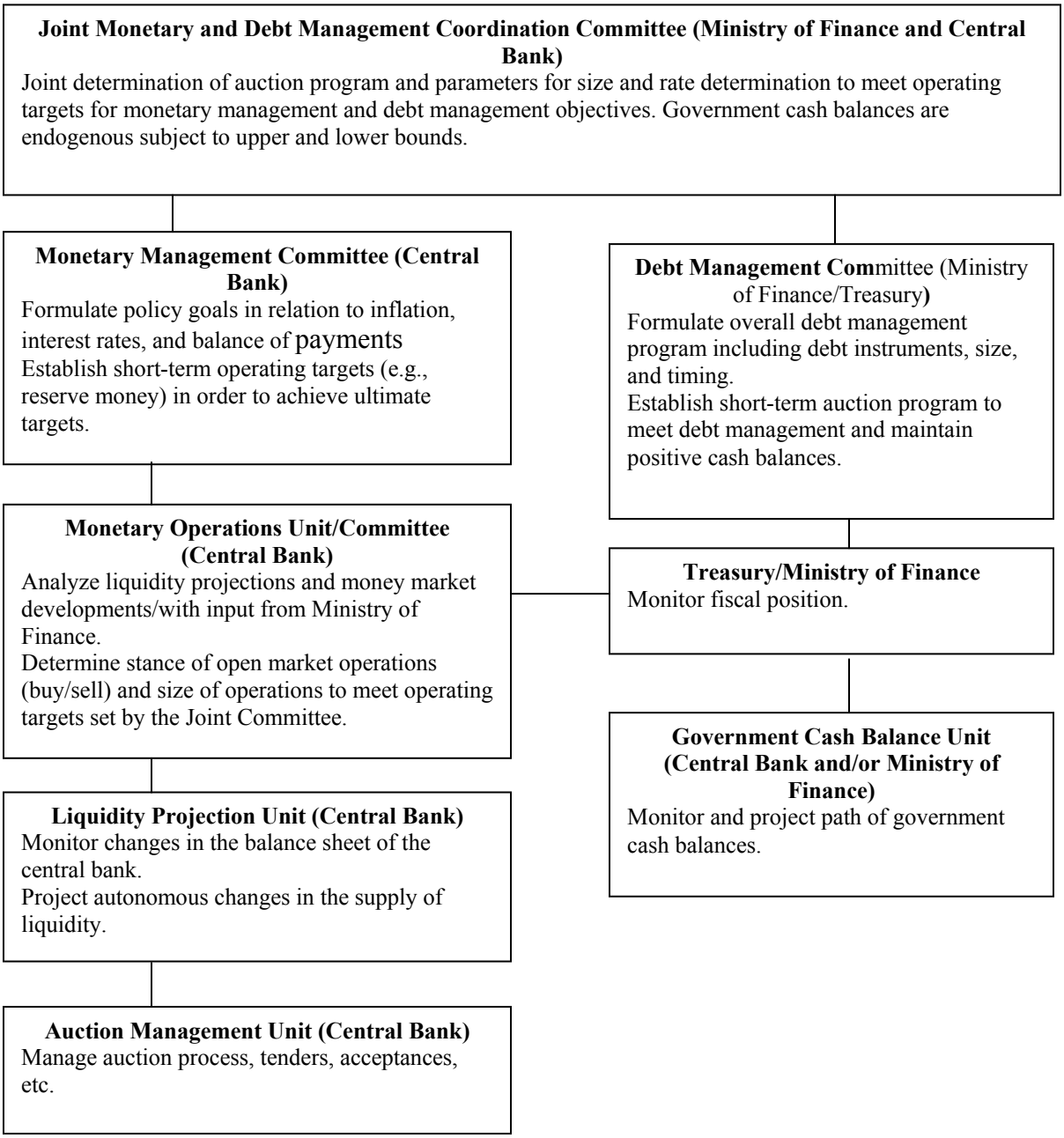
reCBCE= interest earnings on other outstanding debt instruments of the economy (banks and private sector) with the central bank;

ΔCBCE = change in the a (1xm) vector of other outstanding debt instruments of the economy (banks and private sector) with the central bank;

ΔGONA = change in the a (1xm) vector of outstanding other net government assets;

ΔCBONA = change in the a (1xm) vector of other outstanding central bank net assets;

ANNEX III. STYLIZED STRUCTURE OF INSTITUTIONAL ARRANGEMENTS FOR MONETARY AND DEBT MANAGEMENT



Source: Sundararajan, R. Peter Dattels, and Hans J. Blommestein (1997).

ANNEX IV. INTERRELATIONSHIPS AMONG THE BOND AND MONEY MARKETS AND MONETARY POLICY