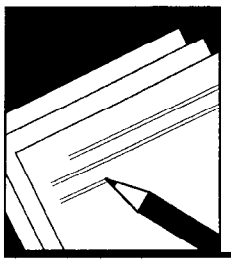
PDP/01/7



IMF Policy Discussion Paper

Monetary Operations and Central Bank Balance Sheets in a World of Limited Government Securities

Mark Zelmer

INTERNATIONAL MONETARY FUND

© 2001 International Monetary Fund PDP/01/7

IMF Policy Discussion Paper

Monetary and Exchange Affairs

Monetary Operations and Central Bank Balance Sheets in a World of Limited Government Securities

Prepared by Mark Zelmer[1]

Authorized for distribution by Piero Ugolini

December 2001

Abstract

The views expressed in this Policy Discussion Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Policy Discussion Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

The limited supply of government securities in some industrial countries has important ramifications for the operating techniques used by central banks to implement monetary policy, provide credit to the financial sector, and also for the assets they hold on their balance sheets. The paper reviews the salient facts regarding the balance sheets and operating techniques of central banks in industrial countries, and outlines different options for dealing with a limited supply of government securities. The main conclusion is that central banks may wish to extend credit using a broad range of assets as collateral, and engage in outright transactions of securities guaranteed by financial institutions.

JEL Classification Numbers: E52, E58

Keywords: central bank, monetary policy

Author's E-Mail Address: mzelmer@imf.org

---

[1] I would like to thank John Broadbent and Chris Ryan (Reserve Bank of Australia), Roger Clews (Bank of England), Denis Blenck and Isabel Von Koppen-Mertes (ECB), Charles Freedman and Donna Howard (Bank of Canada), David Lindsey (Federal Reserve), and IMF colleagues for helpful comments and discussion. The usual disclaimer applies.

I. INTRODUCTION

In recent years there has been a pronounced improvement in the public finances of some industrialized countries. As a result, the stock of government debt issued in the form of marketable securities in those countries is growing less rapidly; between 1995 and 1999 marketable debt issued by industrial country governments (excluding Japan) declined from 45 percent of GDP to 40 percent (OECD, 2001). Government securities are important assets for most central banks because they are often used: (1) in market operations to manage the amount of liquidity in the financial system; (2) as collateral to support the functioning of payment and settlement systems; and (3) as a counterpart to central bank liabilities, such as currency in circulation and commercial bank deposits with the central bank. Although a limited supply of government securities has important ramifications for the functioning of financial markets generally,[2] it is not the only consideration. This paper focuses on the implications for monetary operations and the securities that industrial country central banks hold on their balance sheets.

The main conclusion of this paper is that industrial country central banks may wish to extend credit using a wide range of assets as collateral.[3] Most have already begun taking steps along this path by broadening the range of securities accepted as collateral in repurchase (repo) operations. In some cases they may also wish to engage in outright transactions in securities guaranteed by financial institutions, such as bankers acceptances. In the case of collateralized

---

[2] Partly because of their unique characteristics, especially their minimal credit risk, government securities have come to play an important role in facilitating aspects of private finance, notably the pricing and management of financial risks associated with private securities. As markets for government securities shrink relative to private markets, participants have turned to private instruments to fulfill some of the roles played by government securities. However, it is not yet clear whether good substitutes can be found for all of the public good aspects of government securities. This issue is discussed at length in Schinasi, Kramer, and Smith (2001).

[3] The conclusions drawn in this paper are mainly geared towards central banks in industrial countries. However, they may also apply to central banks in emerging market countries that have small stocks of government securities outstanding and well-developed financial markets.

credit, the securities involved could include those issued by government agencies, other levels of government, and private sector entities. Securities issued by supranational agencies and other foreign entities could also be accepted as collateral in some cases. The principal criteria governing the selection of assets used to collateralize central bank credit should be the riskiness of the asset and its liquidity, rather than the type of issuer. Some suggestions are provided on how to manage these risks and issues surrounding the central bank's involvement in the funds intermediation process.

II. Securities Used in Central Bank Operations

When conducting market transactions, central banks prefer to use securities that are liquid and have minimal credit risk. The liquidity of a security is an important consideration because central banks need to be able to conduct these transactions in large sizes without distorting prevailing market prices, in order to implement monetary policy efficiently, manage their balance sheets, and, when required, supply credit to financial institutions in their role as lender-of-last-resort. Although they could, in theory, carry out trades using any actively-traded security, they have traditionally had a strong preference to do so using those that have low credit risk in order to minimize the risk of incurring a loss because of a default by the issuer of the security. As a result, even now many central banks prefer to use government securities in their outright operations and hold them on their balance sheets because they usually offer the lowest credit risk and are usually the most actively traded securities in the market.

The securities used in repo and collateralized loan transactions are not traded on an outright basis, rather they serve as collateral to help protect a central bank from incurring a loss in the event that its counterparties fail to repay the credit extended to them. Thus, a central bank can focus on the credit risk of the underlying securities used in these operations with less regard

to their liquidity.[4] [5] This flexibility helps to explain why many central banks prefer to implement monetary policy using repos and loans backed by government securities rather than engage in outright transactions.[6]

Other important considerations in the choice of monetary policy operating procedures include the implications for the functioning of financial markets and the independence of a central bank. World Bank-IMF (2001) suggests that where government securities are already in circulation and financial markets are thin, central bank usage of government securities, as opposed to issuing its own securities, for liquidity management purposes helps avoid market fragmentation and supports the role of government securities as a tool for general market development. By the same token, Broaddus and Goodfriend (2001) note that reliance on government securities keeps a central bank out of the economy's funds intermediation process, and minimizes the risk that private-sector credit might be distorted by central bank decisions regarding which assets are eligible for its market and lending operations. They also argue that the choice of operating procedures could affect central bank independence and the effectiveness of monetary policy. In their view, allowing central banks to use non-government securities potentially exposes them to political interference regarding their particular asset choices.

---

[4] Of course, if a counterparty defaulted, a central bank is less likely to experience a loss if the security provided as collateral is actively traded.

[5] The technique used to transfer assets to the central bank also has important consequences for the protection of the central bank in a repo or collateralized loan transaction. The collateral received should be: (1) transferable in book-entry form (ideally deposited with a central depository system in the central bank or in one that is supervised by it); or (2) easily accessible, in order for the central bank to secure ownership (under a repo); or (3) pledged (in the case of a collateralized loan) when credit is extended to the borrower.

[6] In the past, some central banks also preferred repo and collateralized lending over outright operations because they did not have sufficiently deep and liquid domestic money markets in which they could execute outright operations in the requisite volumes without affecting prices.

Central banks' preference for liquid low-risk assets is illustrated by the fact that they mainly hold government securities, repos, and other forms of collateralized short-term credit granted to eligible financial institutions, and foreign assets (Table 1). For most central banks, a significant portion of the latter is composed of securities issued by foreign governments, supranational agencies, and private entities that are actively-traded and have high credit ratings. Some other factors determining the composition of central bank assets include: (1) the extent to which a central bank holds its country's foreign exchange reserves on its balance sheet; and (2) the amount of credit extended to the financial sector in response to requests from individual financial institutions as opposed to at the central bank's initiative. This credit can vary over time and across countries, depending on conditions in the payment and settlement system, the efficiency of the money market, and the financial condition of financial institutions that are eligible to borrow from the central bank.

Central banks require financial institutions that are borrowing funds to pledge or transfer securities as collateral for the credit provided to them. Table 2 suggests that most central banks extend credit to financial institutions through repos or collateralized loans.[7] The distinction between repos and collateralized loans is essentially legal rather than economic, and depends in part on the legal status of each in particular jurisdictions and the assets used as collateral. This is particularly true in countries where there is not an active repo market, but the central bank finds it convenient to use a repo structure to supply liquidity to the financial system. For example, in the Euro System, liquidity-providing operations can be structured either as repos or as collateralized loans, depending on the legal instruments used by the national central banks (in

[7] Although not indicated in the balance sheet data in Table 1, many central banks also provide collateralized *intraday* credit to financial institutions to support the functioning of real-time gross settlement (RTGS) payment systems. This form of credit does not have any monetary policy implications, since it is repaid before the end of the trading day. The same considerations apply for intraday credit as with credit extended for overnight or longer periods.

Table 1. Stylized Central Bank Balance Sheets December 2000 (In percent 1/)

Assets

Central Bank	Net Foreign Assets 2/	Securities owned outright			Credit Extended to Financial Institutions		Other Credit	Total of Preceding
		Government	Financial Institutions	Other	Repo	Other		
Australia 3/	65	9	0	0	26	1	0	100
Canada	4	85	4	0	4	2	0	100
Denmark	52	7	11	0	0	29	1	100
Euro System	39	10	1	1	47	0	2	100
Iceland	23	5	4	0	64	3	1	100
Japan 4/	4	60	0	12	19	1	4	100
New Zealand 3/	3	50	0	0	47	0	0	100
Norway	94	2	0	0	0	4	0	100
Sweden	66	13	0	0	21	0	0	100
Switzerland	75	1	1	2	21	0	0	100
U.K. 5/	0	5	0	2	53	2	39 6/	100
U.S. 7/	5	88	0	0	7	0	0	100

Liabilities and Equity

Central Bank	Currency	Deposits of			Central Bank Securities	Other (net)	Total of Preceding
		Financial Institutions	Government	Other			
Australia 3/	47	1	27	1	0	24	100
Canada	96	5	0	1	0	-1	100
Denmark	20	20	17	3	23	16	100
Euro System	43	30	6	0	0	21	100
Iceland	12	34	15	6	0	32	100
Japan 4/	60	6	23	0	5	6	100
New Zealand 3/	46	1	42	1	0	9	100
Norway	8	4	80	0	0	9	100
Sweden	45	2	0	0	0	53	100
Switzerland	30	5	9	0	0	56	100
U.K. 5/	78	6	1	13	0	2	100
U.S. 7/	95	3	1	0	0	1	100

Source: Central bank annual reports and websites. Data have been reclassified to provide a consistent presentation format across central banks.

1/ As a percent of the sum of: net foreign assets; securities owned outright; and credit extended to financial institutions and other counterparties.
2/ Includes central bank holdings of foreign assets and foreign currency securities of domestic entities, minus central bank foreign currency liabilities.
3/ June 2001.
4/ March 2001.
5/ February 2001. Consolidated data for Banking and Issue Departments.
6/ This mainly reflects an advance to the U.K. National Loan Fund.
7/ Consolidated data for U.S. Federal Reserve Banks.

Table 2. Principal Monetary Operating Procedures in Industrial Countries 1/

	Repo Transactions 2/	Outright Transactions	Rediscount Facilities	Foreign Exchange Swaps	Collateralized Lombard Loan/ Deposit Facilities	Central Bank Securities
Australia 3/	X			X	X	
Canada 4/	X	X			X	
Denmark					X	X
Euro System	X				X	
Iceland	X				X	
Japan	X	X	X		X	X
New Zealand 3/	X			X	X	
Norway	X				X	
Sweden	X				X	
Switzerland 5/	X			X	X	
U.K.	X	X				
U.S.	X	X	X			

Source: Central bank websites

1/ Table refers to the actual use of instruments. Most central banks can activate other instruments if the need arises.
2/ Includes market transactions conducted in the form of collateralized loans and deposits (e.g. Norway).
3/ Deposit facility only. Repo transactions used to extend credit.
4/ Outright transactions used for balance sheet management only. No monetary policy significance.
5/ Use of foreign exchange swaps has declined in recent years.

Germany, all operations are pledges while those in France against securities are repos), and also on the type of collateral used (transactions against bank loans are always pledges, those collateralized by securities can be either repos or pledges).

Many central banks prefer to use government or government-guaranteed securities in their repo transactions (Table 3). This is particularly true in countries where there is an active private repo market in government securities, and the central bank uses this market to execute its repo operations. However, they are generally more willing to accept a broader range of collateral in their rediscount and lombard lending activities. This may reflect the fact that this credit is often extended towards the end of the day to help institutions experiencing shortfalls in the payment and settlement system, and is generally repaid the next business day. In the Euro System, a broad range of assets is accepted for all types of credit operations because the

Table 3. Securities Normally Accepted by Industrial Country Central Banks

Repo Transactions/Facilities 1/

	Government Securities	Govt. Agency Securities	Mortgage Securities	Financial Institution Securities 2/	Other Private Sector Securities	Foreign Securities
Australia	X					X
Canada	X					
Euro System	X	X	X	X	X	
Iceland	X	X				
Japan	X					
New Zealand	X					
Sweden	X	X	X			
Switzerland	X	X	X			X
U.K.	X	X		X		X
U.S. 3/	X	X			X	

Collateralized Lombard Loan Facilities 4/

	Government Securities	Govt. Agency Securities	Mortgage Securities	Financial Institution Securities 2/	Other Private Sector Securities	Foreign Securities
Canada	X	X	X	X	X	
Denmark	X	X	X			
Euro System	X	X	X	X	X	
Iceland	X	X				
Japan	X	X			X	X
Norway	X	X	X	X	X	X
Sweden	X	X	X	X	X	X
Switzerland	X	X	X	X	X	X

Outright Transactions 5/

	Government Securities	Govt. Agency Securities	Mortgage Securities	Financial Institution Securities	Other Private Sector Securities	Foreign Securities
Canada				X		
Japan	X					
U.K.	X	X		X		
U.S. 3/	X	X			X	

Source: Central bank websites.
1/ Excludes central banks in Denmark and Norway, which do not engage in repos.
2/ Securities issued or guaranteed by financial institutions, usually banks. Borrowing financial institutions are not allowed to pledge their own securities.
3/ Private-sector securities accepted are those issued by Fannie-Mae and Freddie-Mac.
4/ Excludes central banks in Australia, New Zealand, the United Kingdom, and the United States, which do not offer collateralized Lombard lending facilities.
5/ Excludes central banks that do not engage in outright transactions on a regular basis.

principle of non-discrimination in favor of public sector issuers proscribed by Article 102 of the treaty establishing the European Community is a key element of the collateral framework. A

wider range of collateral is also accepted by most central banks on a case-by-case basis when they are called upon to help institutions experiencing more protracted liquidity problems.

In all cases, central banks require institutions that are borrowing funds from them to transfer or pledge more collateral than the amount of cash actually borrowed. Requiring "initial margins" or "haircuts" and insisting on daily mark-to-market revaluations of the collateral and "variation margins" helps protect the central bank against adverse changes in the value of the collateral. Such changes can arise from either movements in interest rates and exchange rates (market risk), which directly affect the value of debt securities held as collateral, changes in the risk of default of the issuer of the securities, or changes in the liquidity of the security. Different initial and variation margin requirements are usually set for different securities depending on the risk characteristics of the security in question.

Many central banks that are willing to accept private sector securities as collateral also require that these securities exceed a predetermined minimum external credit rating threshold (e.g. Canada and Japan) or exceed minimum thresholds set by the central bank's internal credit analysis system (e.g. Euro System).[8] In several cases, the list of securities that are accepted as collateral for central bank credit are published on central bank websites (e.g. European Central Bank/Euro System, Sweden, and the U.K.).

Not all central banks have found it necessary to use collateralized credit and outright operations to conduct monetary policy. For example, central banks in Australia and New Zealand are using foreign exchange swaps in addition to repos to manage the amount of liquidity circulating in their financial systems. These swaps were often used in the past by the Swiss National Bank and the Bank of Norway when their money markets were less developed and government securities were in short supply. The Danish central bank manages short-term

---

[8] The Bank of Canada also imposes restrictions on the amount of securities of a single issuer than can be pledged by a borrower for a collateralized loan in the large-value payment system.

interest rates by fixing the lending rate, which is equal to the interest rate on central bank securities. Central bank securities have also been used by the Bank of Japan.

III. Options for Coping with Limited Government Securities

Central banks have already begun to take steps to modify their operations. As noted previously, central banks in Australia and New Zealand have begun using foreign exchange swaps in addition to repos to manage the amount of liquidity in their financial systems. Meanwhile, those in Australia, Canada, Norway, the United Kingdom, and the United States have taken steps to broaden the range of collateral they accept in their repo operations and hold on their balance sheets.[9]

Clearly, a small supply of government securities implies that central banks may need to broaden the range of securities used in their operations beyond those issued by the central governments or make more active use of foreign exchange swaps. The key issue is how to implement this in a way that enables central banks to conduct their operations effectively, while contributing to well-functioning financial markets (or the development of domestic markets), and avoiding undue risks to central banks' financial condition and independence. This is discussed with reference to three techniques for implementing monetary policy: (1) outright operations involving a broader range of securities; (2) collateralized lending operations

---

[9] The Reserve Bank of Australia now accepts in its repo operations Australian dollar-denominated securities issued by certain supranational agencies and those issued by state governments in euromarkets and lodged domestically in a form known as "euroentitlements." The Bank of Canada has started purchasing bankers' acceptances on an outright basis for balance sheet management purposes, the Norges Bank broadened the range of securities it accepts as collateral in 1999, and the Bank of England has broadened the range of collateral it accepts to include foreign currency debt of the U.K. government, sterling-denominated debt issued by supranational agencies, and selected foreign currency debt issued by foreign issuers. The Federal Reserve has accepted securities issued by federally-sponsored agencies in its repo operations since 1966, but altered the pricing of repo operations in July 2000. It is also considering the use of foreign debt and state and local obligations as collateral for repos; see Federal Reserve Bank of New York (2000) and Federal Reserve Board (2001).

involving a broader range of assets; and (3) foreign exchange swaps.[10] These techniques will be evaluated based on the following criteria: (1) implications for the effectiveness of monetary policy implementation and the liquidity of central bank assets; (2) contribution to well-functioning financial markets; (3) implications for the intermediation of funds in the economy and the independence of monetary policy; and (4) implications for the financial condition of a central bank.

A. Outright Operations

For many central banks, this would imply expanding the range of securities held outright on their balance sheets to include those issued by government agencies, other levels of government and their agencies, and private sector entities such as financial institutions and commercial enterprises.

Since government securities are typically the most actively traded fixed-income securities in any domestic financial market, this option implies that a central bank must be prepared to use less liquid instruments in its market operations. However, Gravelle (1999) notes that some countries are finding that trading in non-government securities generally increases, while that in government securities declines, as the stock of government securities declines in importance. That said, in times of market stress, non-government securities can become very illiquid as trading activity shifts in favor of government securities.

---

[10] The options of relying on adjustments to the amount of central bank deposits/securities outstanding and outright purchases or sales of foreign assets are ruled out at the start. Market fragmentation concerns mentioned previously make the issuance of central bank deposits or securities appropriate only in situations where there is not a well-developed government debt market—something that is not the case in most industrial countries. Government securities are unlikely to disappear completely, allowing both central bank and government securities to trade simultaneously would only exacerbate the fragmentation of the market. Moreover, issuance of central bank paper might undermine the financial condition of the central bank if, as a result of sterilization, the central bank found itself paying a much higher interest rate on its liabilities than it received on its foreign assets. Outright purchases or sales of foreign securities and foreign exchange are ruled out because they would have direct effects on the exchange rate.

The proportion of a central bank's securities portfolio that should be held in liquid form depends on the size of its market operations relative to its balance sheet and the volatility of demand for base money. In many countries—notably Canada, Japan, New Zealand, and the United States—most securities owned by central banks are held to maturity as a backstop to base money, and are not actually needed for monetary policy operations. As a result, they do not need to be very liquid because the demand for base money in the economy (and hence the securities backing it) usually grows over time.[11] Thus, central banks that have large holdings of government securities on their balance sheets may be able to shift some of their holdings into less-liquid securities without compromising their ability to conduct monetary policy and manage their balance sheets.

An expressed willingness of the central bank to trade in a broader range of securities might help foster trading activity in those markets. World Bank-IMF (2001) encourages central banks to use government securities in their market operations as a means of helping to spawn trading activity in those markets. A similar argument might hold true if central banks were willing to broaden the range of securities used in their activities. By trading a broader range of securities in the market, central banks would be providing additional liquidity to these markets, which in turn might increase investors' willingness to trade in these markets.

An expanded range of domestic securities would involve a central bank more directly in the intermediation of funds in the economy. There is also a risk that central bank decisions regarding which securities to hold could result in those trading at a premium in the marketplace, and distort the allocation of credit in the economy between that issued in the form of securities and other forms. There are ways to mitigate this risk. For example, a central bank could indicate

---

[11] While this has historically been the case, it is important to note that in the future, the growth of base money could be undermined by declining demand for central bank deposits and the growing substitution of currency by noncash means of payment. Henckel, Ize, and Kovanen (1999) discuss these trends and their implications for the implementation of monetary policy.

that it will entertain all securities that exceed a minimum credit rating threshold set with respect to ratings published by reputable external credit rating agencies (e.g. AAA, or AA or better if there are not enough AAA securities available), and a minimum amount outstanding threshold to help ensure that the security is sufficiently liquid. It could also precommit to hold a portfolio on its balance sheet whose composition reflects that of the market as a whole for securities that satisfy its thresholds.[12] While this may, at the margin, cause all securities within that class to command a premium price, it helps to minimize the central bank's involvement in funds intermediation within that class. In addition, such an approach, by constraining the judgment exercised by the central bank in the execution of its monetary policy and balance sheet management operations, helps to reduce the risk that the market might, inappropriately, examine these operations for signals regarding the central bank's opinion on the credit-worthiness of the issuer of the security being transacted, or treat the issuers of the securities in question as being "too big to fail".

There is also a risk that central bank independence could be undermined, but this should be manageable. As Broaddus and Goodfriend (2001) note, allowing a central bank to transact in a broader range of securities may give rise to external pressure on the central bank to give preference to securities of certain entities or industries. Some ways to forestall such pressure are: (1) to ensure that the central bank's market operations are carried out in a transparent fashion so that any such pressure is subject to public scrutiny; and (2) to delegate the management of the central bank's securities portfolio to external investment managers. The previous suggestion that central banks manage their holdings of domestic securities like an

---

[12] Meyer (2001) suggests that the management of such a portfolio could be handled externally by having a central bank solicit proposals for a mutual fund that would operate under some strict guidelines related to appropriate indexing and asset quality. This could help to insulate a central bank from inappropriate external interference in its operations, and might offer significant cost-savings. However, it might impede some central banks' efforts to leverage off these operations to improve their understanding of the markets for private-sector securities.

index fund helps to insulate them from undue external influence. In addition, a central bank's portfolio managers could also be required to publicly account on a regular basis for the performance of its domestic securities portfolio in terms of how well the central bank's securities portfolio tracked a properly defined index that is made public. Such a practice is becoming increasingly common in public debt and foreign exchange reserves management, and helps ensure these activities are insulated from undue interference and devoid of signaling content.[13]

Expanding the range of domestic securities exposes central banks to additional credit risk, which would have to be managed. Other securities—whether they be issued by government agencies, financial institutions, or private corporations—carry more credit risk than government securities, which are usually risk-free. Consequently, if central banks hold a broader range of securities, they would have to protect themselves against losses that might arise from default by the issuer. As noted previously, there are a number of procedures that can be used in this regard, such as: maintaining minimum credit rating thresholds; restricting outright transactions to securities guaranteed by financial institutions, such as bankers' acceptances, that provide the central bank with a claim against the bank and the underlying corporate borrower; and possibly setting limits on the amount of securities of a single issuer that are held on the balance sheet. Central banks could also hold reserves on their balance sheets to cover any future losses.

An important issue to resolve is whether central banks should trade in securities of financial institutions for which they are the regulator or have close ties to the regulator. In such cases there is a risk that the market may perceive that the central bank is trading in these

---

[13] The IMF/World Bank Guidelines on Public Debt Management and the IMF Guidelines on Foreign Reserves Management stress the benefits of transparency in the conduct of public debt management and foreign reserves management.

securities on the basis of privileged information obtained either through its regulatory role or ties to regulators, which could further undermine the stability of an institution suspected of being in difficulty. Some central banks, like the Bank of Japan, have addressed this issue by refusing to hold securities of financial institutions they supervise. Others, such as the Bank of Canada, address it by only dealing in short-term debt securities guaranteed by banks, and adhering to conservative pre-announced minimum external credit rating thresholds—that is, AA or better—where the probability of an unexpected default is highly remote. In such cases, the security is more likely to be downgraded below the threshold, and thus become ineligible, before a default takes place.

B. Expanded Collateralized Lending Operations

This option implies that central banks would be willing to accept a broader range of securities issued by domestic entities, supranational agencies, and foreign entities as collateral when they extend credit to the financial sector.[14] The credit extended could be granted using repo, a lombard facility, or rediscount vehicles depending on individual country circumstances. It reflects the practice of the Euro System and some other European central banks, where the credit granted is underpinned by a wide range of securities and also some non-marketable assets that meet certain prescribed criteria with respect to their risk characteristics. As noted previously, it is an option that is already being pursued by many central banks.

This option should not pose any significant problems for monetary policy implementation or the liquidity of central bank assets. Expanding the range of assets used as collateral in central bank credit-granting operations would not have any significant implications for the conduct of monetary policy. Similarly, increased reliance on these operations at the

---

[14] While accepting foreign securities might make appear to be an attractive way for individual central banks to broaden the collateral pool in their respective markets, such an approach would not necessarily represent a global solution to the issue if most central banks went down this path.

expense of outright operations should not have any material effects on the liquidity of central bank assets. Although there is no secondary market for previously-negotiated central bank credit (it is not tradable in the conventional sense), central banks can offset the economic effects of a credit-extension before it matures by borrowing funds from the financial sector.

For longer-term or permanent liquidity adjustments, central banks would need to roll over central bank credit on a regular basis. These agreements tend to have tenors that are less than 12 months, and often 3 months or less. Thus, for these type of liquidity adjustments central banks should consider executing longer-term credit operations, such as 3-month loans, in order to avoid having to roll over the entire portfolio on a frequent basis. To provide added flexibility, it might be useful to stagger the maturity dates of credit granted to avoid a bunching of maturities and minimize rollover risk.

Central bank credit can be extended effectively in the absence of an active secondary market for the underlying securities. One of the advantages of repo operations is that they can take place in the absence of an active secondary market for the security provided as collateral, since the purchase and repurchase conditions are known in advance and can be made transparent to market participants. Conducting central bank credit operations with a broader range of securities might help to stimulate additional trading activity in the underlying securities because market participants might be more willing to trade these securities knowing that they can be used to obtain central bank credit.

The implications for funds intermediation and central bank independence should be minor. In contrast to the previous option where central banks choose which securities to transact in their market operations and hold on their balance sheets, this option helps to minimize a central bank's involvement in the intermediation of funds in the economy. When a central bank is supplying liquidity, the financial institutions receiving the central bank credit select the collateral to be used in the operation, subject to the parameters set by the central bank regarding

which assets are deemed to be acceptable collateral, and possibly limits on the amount of securities of a single issuer that can be pledged by a borrower.

A central bank may have indirect effects on funds intermediation, inasmuch as it sets the parameters that determine which assets can be used by financial institutions to obtain central bank credit. The Committee on the Global Financial System (2001) suggests that these effects might be modest. Even so, there are ways to contain these effects. A central bank could indicate that it would entertain all assets as collateral that meet certain prespecified and easily monitored criteria in terms of risk and liquidity. For example, it could announce ahead of time that it would accept those that have a prespecified minimum credit rating from a reputable external credit rating agency, a predetermined minimum amount outstanding, and that are lodged in a domestic electronic securities settlement system (to facilitate transfers between the central bank and its counterparties). While these criteria may, at the margin, cause all assets satisfying the criteria to command a premium price, it helps to minimize the central bank's involvement in allocating credit within that class.[15]

Limiting the amount of judgment exercised by the central bank in selecting the assets that can be used as collateral also helps to reduce the risk that the market might, inappropriately, examine central bank lending operations for signals regarding the central bank's opinion on the credit-worthiness of the issuer of the security. Such an approach would also contribute to the transparency of the central bank's market operations, thereby helping to ensure that any external pressure on the central bank to give preference to certain entities or industries is subject to public scrutiny.

---

[15] Broadening the list of securities that could be used as collateral in these operations would help to alleviate any market distortions that may already exist when central banks limit the range of acceptable collateral to government securities.

Accepting securities issued by foreign entities as collateral in lending operations might expose a central bank to public scrutiny regarding which countries' securities to favor. While this might be a legitimate concern, it should not be overstated. Central banks already face this issue on an ongoing basis in their role as manager of the foreign assets held on their balance sheets or in government accounts. As indicated previously, clear investment guidelines combined with properly defined performance benchmarks and public reporting obligations should help to contain any unwarranted external interference in the management of these assets. And proper safeguards and procedures need to be in place to ensure that these assets can be transferred between the central bank and the borrowing financial institution efficiently, and that the central bank has ready access to these assets in the event of a default by its counterparty.

Lending operations involving a broad range of assets pose less credit risk for a central bank than outright operations involving the same assets. Assuming proper procedures are in place to ensure that a central bank has clear access to the assets in the event of default by the borrowing financial institution, these operations should enjoy lower credit risk than holding the assets on an outright basis.[16] Collateralized loans essentially constitute a double-claim against both the borrowing financial institution and against the underlying asset. For a central bank to suffer a loss, both the financial institution that provided the asset as collateral and the underlying borrower would have to default simultaneously—an extremely rare event.[17] Moreover, collateralized loans, unlike outright transactions benefit from the haircuts/margins discussed previously, although these may be less effective in times of extreme market stress.

---

[16] However, in the event of default the central bank would become exposed to the market and liquidity risks associated with the underlying collateral.

[17] This is one reason why central banks do not allow borrowing institutions to provide their own securities as collateral.

These two factors make it easier for central banks to entertain a broader range of securities in their monetary policy operations without jeopardizing their financial condition.

One question that may arise is whether a central bank should delegate some of the functions related to the management of the collateral to an external institution, for example through a tri-partite repo structure. This is particularly useful when borrowers are allowed to substitute replacement assets for the collateral during the life of the loan. Such innovations require more sophisticated tools and expertise to value the collateral and manage the risks associated with the collateral, which may not be readily available in central banks. However, two issues arise in this respect: (1) proper safeguards need to be in place to protect the central bank against the risk of loss in the event of operational problems at, or even outright failure of, the entity that is managing the collateral on behalf of the central bank; and (2) a central bank should take care to avoid conveying an impression that the institution managing its collateral is "too big to fail."

Since collateralized loans are short-term agreements, they help to limit a central bank's exposure to interest rate risk. Central banks seeking to minimize their exposure to interest rate risk would typically prefer to hold assets that are either short-term or have interest rates that are frequently reset because their liabilities are either non-interest-bearing, or have interest rates that are frequently adjusted. As noted previously, collateralized loans typically mature within a few months at most.

C. Foreign Exchange Swaps

The option of foreign exchange swaps involves operations in the foreign exchange market and does not involve the transfer of securities in the first instance. These transactions do not have any direct effects on the exchange rate because the purchase (sale) of foreign currency in the first leg of the transaction is offset by a simultaneous forward resale (repurchase) of the

foreign exchange.[18] They have been particularly useful in the past for countries like Norway and Switzerland, which had large stocks of foreign assets, active foreign exchange markets, but a domestic fixed-income market that was at an early stage of development.

The attractiveness of foreign exchange swaps as a primary instrument of liquidity management might be limited because, for some central banks, settlement arrangements are complicated by the lack of delivery-versus payment, especially when there is a need to conduct transactions across time zones.[19] Also, at the margin, foreign exchange swaps may not be well-suited for liquidity-withdrawing operations, since they represent a temporary contingent claim against a central bank's foreign assets during the life of the swap. This could limit the availability of these assets for use in foreign exchange market intervention. However, this need not be a major concern, inasmuch as industrial country central banks are not normally active interveners in the foreign exchange market, and intervention could be funded, if necessary, through offsetting foreign exchange swap transactions.[20]

This option should not pose any concerns regarding the liquidity of central banks assets. Foreign exchange swap markets in most industrialized countries are very deep and liquid, and

---

[18] The market convention for pricing foreign exchange swaps is to quote the spread between the forward and the spot exchange rate, rather than quote separate prices for the two legs of the transaction. Covered interest parity ensures that foreign exchange swap prices are set on the basis of interest rate differentials prevailing for the underlying countries. For example, the price quoted for a 3-month foreign exchange swap between pound sterling and the euro would be set on the basis of the difference between 3-month interest rates in the United Kingdom and the Euro zone.

[19] The merits of central banks using foreign exchange swaps is discussed in more detail in Hooyman (1997).

[20] If foreign exchange market intervention is funded through the foreign exchange swap market, appropriate disclosure practices must be in place to ensure that market participants and the general public are aware of the resulting future claims against the country's foreign exchange reserves. The IMF's Special Data Dissemination Standard (SDDS) offers guidance in this respect.

usually more active than domestic fixed-income markets. Indeed, BIS (2001) notes that these markets are the most active segments of the foreign exchange market, eclipsing underlying spot markets for foreign exchange. Consequently, central banks should not normally experience any difficulty in executing the transactions volumes needed to manage the amount of monetary liquidity in the domestic financial system without having to be concerned about material effects on quoted swap prices. In addition, while there is no secondary market for previously negotiated swaps (they are not securities in the conventional sense), central banks can offset a swap before it matures by executing a swap in the opposite direction.

Inasmuch as these swaps do not involve domestic securities, there are no direct implications for the functioning of the domestic fixed-income market. And there should not be any implications for domestic funds intermediation or central bank independence. Using these swaps enables central banks to sidestep the need to take decisions regarding which assets to hold on their balance sheets.

Foreign exchange swaps are not collateralized in the same way as collateralized loans. As a result, a central bank takes on the credit risk of the commercial bank counterparty with which it executes the swap without the security of any underlying collateral to claim in the event of default. Although a central bank receives substantial protection from the fact that the proceeds received at the beginning of the swap can be invested in low-risk assets, it might still experience a loss if the exchange rate moved sharply against it over the life of the swap, and the counterparty to the swap failed to honor its side of the transaction. In this case, the loss would arise if central bank had to enter the market to replace the contract.

In order to manage the credit risk associated with these swaps, central banks could adopt many of the risk management practices used by commercial banks active in this market. These include: (1) setting caps on exposures to individual counterparties, marking-to-market exposures on a daily basis to take account of exchange rate movements, and ensuring that any unrealized losses are charged against these caps; and (2) working with market participants to

introduce netting arrangements that limit the credit risk of counterparties to the net, rather than gross exposure when there are multiple transactions with the same counterparty. They could also consider adopting a practice that is common in futures markets, and introduce an agreement with their counterparties that these transactions will be marked-to-market on a daily basis, with a cash settlement between parties to eliminate the resulting credit exposure.

Looking to the future, the settlement risk associated with foreign exchange swaps may decline following the introduction of continuous-linked settlement (CLS) services. A special-purpose bank will, in effect, hold a settlement account at each of the central banks for the currencies participating in the system so that it can process both legs of a foreign exchange transaction virtually simultaneously, thereby reducing the amount of settlement risk that currently exists in the foreign exchange market. Thus, central banks wishing to implement monetary policy using foreign exchange swaps may be able to minimize settlement risk through this system provided it offers same-day functionality.[21]

IV. Conclusions

Three options were considered to help central banks broaden the range of assets used in their market operations in order to cope with the effects of a limited supply of government securities on their operations in financial markets. Using government securities is clearly the most attractive option for central banks, since the three options considered in this paper pose various risks and concerns. However, when this is not practical, the risks and concerns associated with the three options can be managed in one way or another.

Making greater use of collateralized credit involving a broad range of assets appears to be an attractive option when relying solely on government securities is no longer practical. It is a course that is already being pursued by many central banks. In contrast to conducting outright

---

[21] Further details on how CLS is expected to operate can be found on the website of CLS Bank (www.cls-services.com).

transactions, these loans, whether executed in the form of repos, lombard credit, or rediscount operations, would enable central banks to conduct operations in the requisite volumes without directly affecting the pricing of the underlying securities. They are also fairly short-term operations, which facilitate central bank balance sheet management, and they pose little credit risk for the central bank provided proper safeguards and procedures are in place to manage the risks associated with the underlying collateral. Perhaps most important, they help to shelter central banks from becoming too directly involved in the intermediation of funds in the economy—a potential concern with outright transactions. The experience of central banks in Europe offers concrete evidence that monetary policy can be implemented effectively and central bank finances managed prudently using credit collateralized by a broad range of assets. That said, central banks might also wish to consider engaging in outright transactions in securities guaranteed by financial institutions when there is a need to provide longer-term or permanent liquidity injections, or as a means of encouraging more active trading in the domestic money market.

As for foreign exchange swaps, markets for these instruments are very deep and liquid, which facilitates the execution of large operations by the central bank. They also avoid some of the thorny issues associated with transactions involving securities. However, there are important issues with respect to credit risk and settlement risk that limit their attraction as a primary tool for domestic liquidity management. Nonetheless, some central banks have found that they can be a useful complementary tool.

References

Bank for International Settlements, 2001, "Central Bank Survey of Foreign Exchange and Derivatives Market Activity 2001: Preliminary Global Data," Press Release (October 9).

Broaddus Jr., J. Alfred, and Marvin Goodfriend, 2001, "What Assets Should the Federal Reserve Buy?" *Federal Reserve Bank of Richmond 2000 Annual Report*, Richmond.

Committee on the Global Financial System, 2001, "Collateral in Wholesale Financial Markets: Recent Trends, Risk Management, and Market Dynamics," March, (Basel: Bank for International Settlements).

Federal Reserve Bank of New York, 2000, "Announcement of Changes in the Management of the System Open Market Account (SOMA)," July 5, (New York).

Federal Reserve Board, 2001, "Minutes of the Federal Open Market Committee," January 30-31, (Washington).

Gravelle, Toni, 1999, "Markets for Government of Canada Securities in the 1990s: Liquidity and cross-Country Comparisons," *Bank of Canada Review*, Autumn, (Ottawa).

Henckel, Timo, Alain Ize, and Arto Kovanen, 1999, "Central Banking Without Central Bank Money," IMF Working Paper WP/99/92 (Washington: International Monetary Fund).

Hooyman, Catharina, 1997, "Use of Foreign Exchange Swaps by Central Banks," *Instruments of Monetary Management: Issues and Country Experiences*, ed. By T. Baliño and L. Zamalloa (Washington: International Monetary Fund).

International Monetary Fund, 2001, *Guidelines on Foreign Reserves Management*, Washington.

International Monetary Fund and World Bank, 2001, *Guidelines on Public Debt Management*, Washington.

Meyer, Laurence H., 2001, "Executing Monetary Policy Without Treasuries," Remarks by Governor Laurence H. Meyer at the 52nd International Atlantic Economic Conference, Philadelphia, Pennsylvania (October 12).

Organization for Economic Cooperation and Development, 2001, *Central Government Debt Statistical Yearbook 1980-1999*, Paris.

Schinasi, Garry J., Charles F. Kramer, and R. Todd Smith, 2001, "Financial Implications of the Supply of U.S. Treasury Securities," IMF Working Paper, WP/01/61 (Washington: International Monetary Fund).

World Bank-IMF, 2001, *Developing Government Bond Markets: A Handbook*, Washington.