

Developing financial markets and operating monetary policy in Asia

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1. Introduction

A central bank needs to frame and to set monetary policy at the strategic level. It also needs to adopt operating procedures to implement its chosen policy. This is where the rubber hits the road. In this image the road is the underlying banking and financial markets. They change over time, and the appropriate monetary operating procedures will change over time with them. This paper explores the reciprocal relationship between developing financial markets and conducting monetary policy operations. Its intended audience is central bankers in East Asia, but it draws on experience outside the region.

This paper develops three themes in each direction of the reciprocal relationship. Each pair of themes includes two analytic statements and a policy recommendation.

Section 2 of the paper argues how monetary operations can contribute to financial development. The first theme here is that there are typically degrees of freedom in conducting monetary operations. The second theme is that the choices made in respect of operating procedures are fateful for financial development in that whatever instruments and markets the central bank uses for its operations will tend to gain liquidity and breadth. The third theme follows as a consequence: the central bank should use its degree of freedom in performing monetary operations consciously to further financial market development. An immediate implication is that the right choices of instruments and markets will depend on the current state of financial market developments.

Section 3 argues that, while policymakers make important choices in conducting monetary policy operations, they cannot make any choices they want. Financial developments and financial development constrain monetary operations in three ways. First, the balance sheets of the government and the central bank limit operations. Second, financial development in general and the balance between the banking system and securities markets, in particular, shape the choice of instruments in executing monetary policy. Third, the central bank should align its operating choices to the state of financial development.

2. Operating procedures serving financial development

The burden of the argument of the first half of this paper is that there are synergies between the central bank objectives of monetary stability and financial development. These arise from the degrees of freedom in the asset and liability composition of the central bank balance sheet under modern central banking. Given that central bank operations will tend to impart liquidity to the chosen instruments, the central bank can make its choices with an eye to developing financial markets.

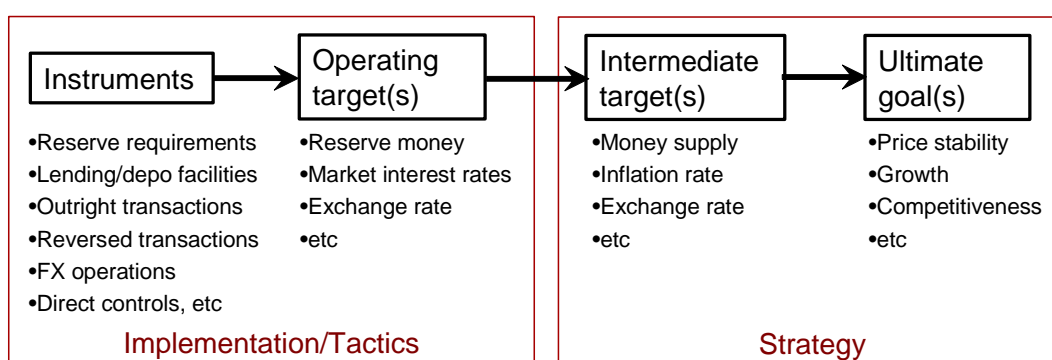
¹ robert.mccauley@bis.org. Thanks are due to Claudio Borio, Jane D'Arista, Andy Filardo, Corrinne Ho, Sukdhave Singh, Eli Remolona and Pongpen Ruengvirayudh for discussion of the issues, and Daranee Saeju for data on Thai repos, though they bear no responsibility for the errors or judgements herein. The views expressed are those of the author and not necessarily those of the Bank for International Settlements.

2.1 The degrees of freedom in conducting monetary operations

The dominant monetary policy approaches nowadays do not carry with them a theory or a prescription for the central bank balance sheet. Fiat monetary systems managed with a view to stabilising inflation and growth, with or without formal inflation targeting, have no particular implications for the balance sheet of the central bank (Papadia and Würtz (2007)). On the asset side, such systems are indifferent to domestic or foreign assets, sovereign or private obligations, and permanent or frequently reversed transactions. Such systems share banknotes as a liability but can operate with bank reserves adequate for no more than clearing purposes, or with required reserves, whether remunerated or not.

This point can be made in terms of the schematic diagram below (Ho (2007)). The varying choices with respect to, from right to left, ultimate goals, intermediate targets, and operating targets are compatible with a range of instrument choices.

The tactical and strategic aspects of monetary policy



It is helpful to contrast this state of affairs with monetary approaches that carried clear implications for the central bank's balance sheet, the "real bills" doctrine and the currency board approach. The "real bills" doctrine of central banking embodied in the original Federal Reserve Act had a theory on the proper assets of the central bank: discounts against short-term, self-liquidating obligations of the private sector and gold. A central bank that held or discounted government paper, by contrast, was thought to court inflation. In retrospect, of course, the "real bills" doctrine has been criticised as offering no proof against an inflationary monetary policy and as pro-cyclic. Whatever its flaws as a monetary regime, however, this doctrine had a theory on what the central bank and, by extension, the banking system should carry as assets.

Similarly, the currency board approach carries clear implications for the monetary authority's balance sheet. It requires a match of gold, silver or foreign exchange against its banknotes outstanding. For example, the Hong Kong Monetary Authority (2007, pp 93–94) earmarks part of its foreign assets as a "backing portfolio", which "holds highly liquid US dollar-denominated securities to provide full backing to the Monetary Base as required under the Currency Board arrangements". As it happens, this backing portfolio only represents a portion of the Exchange Fund's foreign assets, with the balance having as its counterparts accumulated fiscal surpluses and essentially the net worth of the Exchange Fund. Thus, the Exchange Fund's assets and liabilities can be seen as a "currency board plus", but for the present purpose the aspect worth emphasis is that the currency board part has implications for assets, liabilities and the relationship between them.

It is worth pausing to marvel at how modern monetary approaches have elaborated the three right-hand elements in the diagram above, even as they have fallen silent on the first. The result is that the operations of monetary policy take place in increasing isolation from the strategy of monetary policy. While central bankers pay attention to operations,² it is the rare monetary economist who casts a glance at the operational side of policy (Friedman (1999) and Woodford (2000)).

For the present purpose, the orphan status of operations creates an opportunity. This is because the choice of operating instruments makes a difference to the evolution of financial markets, as argued in the next section.

2.2 Monetary operations and financial market liquidity

The choice of a particular operating instrument tends to have positive external effects on the liquidity of the chosen market. Examples of such effects can be given from the Federal Reserve's history and more recent Asian history. The prospect, all too transitory in retrospect, of the US Treasury running surpluses to an extent that the Federal Reserve would have had to change its operating procedures' reliance on Treasury securities led to a useful (if ultimately moot) re-examination of alternatives (Broaddus and Goodfriend (2001), Kohn (2002), Marshall (2002) and McCauley (2002)).

The original Federal Reserve Act: support for the bankers' acceptance market

The 1913 Act sought to develop a market in the United States for the financing of US foreign trade. Theretofore US trade had been financed in Europe, mostly in London. This was thought to be an undesirable state of affairs both from the standpoint of the cost and from the standpoint of currency exposure, since the London acceptances were denominated in sterling (LaRoche (1993)).³

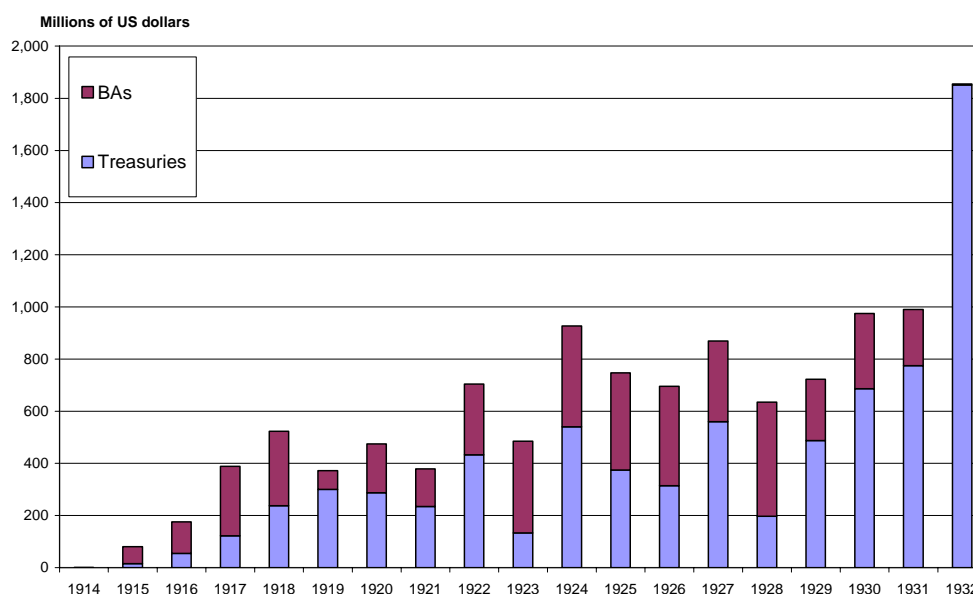
The Act provided two incentives for the relocation of the financing of US trade. It made bankers' acceptances (BAs) eligible for discount or outright purchase by the new Federal Reserve and exempted the acceptance liability from reserve requirements. The Federal Reserve Bank of New York also purchased acceptances for the account of foreign central banks, adding its signature and in effect making the private paper into a government obligation.

The developmental use of the Federal Reserve's balance sheet worked. Although Federal Reserve holdings of BAs declined in World War I, they came by the late 1920s to finance a third to a half of US imports and exports (LaRoche (1993, p 134)). In practice, the Federal Reserve both bought BAs outright and entered into repurchase agreements against them. It held on average a third of the outstanding stock and at times half. In terms of the Fed's portfolio these holdings of private paper bulked larger than holdings of Treasury paper before the US entry into World War I and in 1923, 1926 and 1928 (see graph below).

² See Kneeshaw and Van den Bergh (1989), Borio (1997), Van 't dack (1999), Borio and McCauley (2001), Patrawimolpon (2002), Bank of Korea (2002), Monetary Authority of Singapore (2003), Tuano-Amador (2003), Ryoo (2006) Central Bank of China (2006), Bank of England (2007), Archer (2006) and Ho (2008).

³ By the 1980s, much of Japanese external trade was financed with US bankers' acceptances. One of the aspirations of those who sought to internationalise the yen was to build up the yen bankers' acceptance market. See Sakakibara and Kondoh (1984) and McCauley (2006b).

Federal Reserve holdings: Treasuries and bankers' acceptances



Note: Holdings of BAs in the early years include purchases under repo agreements.

Source: Meulendyke (1998, p 22).

Federal Reserve support for the BA market resumed in 1955 but never reached the levels seen between the World Wars. In the 1970s the Federal Reserve concluded that the market could stand on its own and ceased endorsing acceptances for its foreign correspondents. In 1977 outright purchases ceased and in 1984 repos against BAs ceased. BAs' exemption from reserve requirements boosted outstandings in the high-inflation and high interest rate years of the late 1970s and early 1980s. However, the subsequent reduction of reserve requirements for large certificates of deposit and Eurodollars in 1990 left BAs little advantage over commercial paper and other means to finance trade and the market has since languished.

The Federal Reserve "bills only" controversy, 1953–1961, and market liquidity

After the post-war agreement with the Treasury in 1951 to unpeg interest rates on Treasury securities, the Federal Reserve debated whether to operate in Treasury bills only or in the full range of Treasury securities. Washington favoured a "bills only" approach while New York argued for the flexibility to operate across the yield curve. The differences between Washington and New York have usually been pinned on a difference of views on the economics of the yield curve or a difference on the need for clarity of goals given the recent pegging of long-term rates. On the economics, the Washington position trusted to arbitrage across highly substitutable securities of different maturities to transmit the effect of operations in short-term bills while New York argued that occasional "limited direct entry into the long-term market" could usefully affect the yields on imperfectly substitutable securities (Ritter (1980, p 110)). On the clarity of goals, the "approach left longer maturity coupon securities free to trade without Federal Reserve interference, helping the market-clearing mechanisms to function and emphasizing that longer term interest rates were no longer pegged" (Meulendyke (1998, p 35)).

Whatever the force of these arguments,⁴ the effect of the locus of operations on market liquidity is an additional, since neglected, difference between the two sides. President Sproul of the Federal Reserve Bank of New York argued in testimony before Congress against the claim by Chairman Martin that operations in bills had contributed to the “depth, breadth and resiliency” of the Treasury note and bond market. Instead,

“It is my information and observation that the market for longer term securities has remained at least as “thin” under existing open market procedures as it was before these procedures were adopted. I think it has lost depth, breadth and resiliency, whether you view it in terms of dealer willingness to take position risks, volume of trading or erratic price movements” (Ritter (1980, p 108)).

In short, an important part of the argument for operations in longer-dated coupon securities was that they would help make this market segment more liquid.

Federal Reserve operations in the repo market: nurturing the securities dealers

Nowadays the Federal Reserve operates in repos to fine-tune the availability of bank reserves. Its daily transactions were said by Lumpkin (1993, pp 70 and 73) to amount to \$1.5–\$6 billion in 1992, compared to daily total transactions of \$629 billion then reported by the primary dealers. The argument for the use of repos has echoes of the argument for bills only: by conducting short-term reversed operations, the Federal Reserve does not affect the price discovery in the underlying securities. But the original use of repo operations had more to do with market development in general, and the nurturing of a group of non-bank securities dealers in particular.

The Federal Reserve’s repo operations in its first 60 years were predominately a means to provide liquidity to non-bank dealer firms. Lumpkin (1993, p 69) reports that the Federal Reserve conducted repos in 1917 with member banks, but these were discontinued “a few years later” until 1975, when bank dealers were made eligible as repo counterparties. In the 1920s and early 1930s repos were “infrequently” conducted with non-bank dealers. Meulendyke (1998, p 27) reports that repos against Treasury securities and BAs would be arranged at the initiative of the dealers for periods of up to 15 days, with early repayment permitted. At the systemic level, Meulendyke highlights the safety-valve function of such dealer-initiated operations, in that they relieved shortages caused by Treasury cash management or other autonomous factors. In addition, however, from the standpoint of the dealers and their customers, such accommodating transactions with the central bank at times of “temporary credit stringency” must have been reassuring.

After a lull during World War II, repo operations were resumed in mid-1949 (Lumpkin (1993, p 70)) or 1951 (Meulendyke (1998, p 37)). The latter notes a shift to operations carried out at the Fed’s initiative “to provide temporary, but immediate, reserve assistance to the central money market at times of unusual strain on that market” (quoting the New York Fed’s report on operations in 1953 to the FOMC).

“Until the 1970s, RPs were done only with nonbank dealers at preannounced rates – usually at or slightly below the discount rate – although beginning in 1968, the RP rate was occasionally set slightly above the discount rate. The practice of arranging RPs only with nonbank dealers was a holdover from the earlier view that RPs served primarily to finance dealer positions in securities. On occasion during the 1950s and 1960s, an RP would still be arranged at the request of

⁴ Friedman and Schwartz (1963, p 633) note that if the “securities market is so fluid and interconnected that the effects of purchases or sales in any part of the market are transmitted very rapidly to all other parts”, then the structure of rates would not be affected by a departure from the “bills only” doctrine.

dealers facing difficulties in financing their positions in the markets. In discussing repurchase operations at [one of] the FOMC's annual reviews [in 1961] Governor J. L. Robertson objected to the FOMC's use of the instrument, arguing that RPs were not security purchases in the open market, as authorized by the Federal Reserve Act, but were actually loans to dealers... Governor Robertson was particularly troubled by the practice at the time of lending through RPs only to nonbank dealers and at rates below the discount rate... Most members disagreed. They considered RPs to be an appropriate instrument that had proved to be of inestimable value in the implementation of monetary policy; their continued use was authorized."⁵

On this reading, before repos became the main Federal Reserve instrument they served to nurture non-bank securities dealers. Into the 1960s these could approach the Federal Reserve for financing of their government securities. Whether the rate at which the transaction could be conducted was in some sense favourable in relation to the rate that member banks would pay at the discount window would have been a very secondary consideration. The more important impact would have been on the financial management of the primary dealers and even more on their customers' assessment of the counterparty risk of the dealer.

The character of the repo operations subsequently became more symmetrical, more competitive and more inclusive. In particular, the introduction of matched sale-purchase transactions in 1966 meant that repos could drain as well as inject liquidity, the introduction of the "competitive go around" technique of contacting all the primary dealers at once in 1972 rendered the operation more competitive, and the addition of bank dealers to the list of eligible counterparties in 1975 made the operations more inclusive.

Still, the nurturing of the non-bank dealers continued to have an effect. Lumpkin (1993, p 67) cites the attraction of repos to investors subject to "prudent investor" or other types of asset restrictions, such as public bodies required to invest tax receipts or the proceeds of bond issues in Treasury securities. These could invest in repos against Treasury securities instead of buying them outright. In some cases, such investments would be restricted to repos with primary dealers designated by the Federal Reserve.

"Money market mutual funds are also major participants in the RP market... Because RPs are deemed to be loans under the Investment Company Act of 1940 and carry risks not typically associated with direct security investments, mutual funds often limit their RP investments to RPs with maturities of seven days or less that are arranged with member banks of the Federal Reserve System or dealers on the Federal Reserve Bank of New York's list of reporting dealers."

Stepping back, the operations by the Federal Reserve Bank of New York in the repo market not only added transaction volume to this market, but also raised its profile among institutional investors. Thus, cash-rich entities like state and local governments more readily placed funds in the market, and insurance companies and pensions holding securities more readily in effect lent their holdings of Treasury securities to the market-making dealers. When, as in the early 1980s with the Drysdale crisis, risky and inconsistent market practices were revealed, the Federal Reserve and the Treasury helped write legislation to improve the workings of the market. These days, repo transactions between private parties dwarf those between private parties and the Federal Reserve. Taking a long and broad view, the Federal

⁵ Meulendyke (1998, p 37 with interposed footnote 39 from p 230) added the Robertson objection to the 1998 edition; perhaps research occasioned by the Salomon Brothers scandal had brought this discussion to her attention.

Reserve involvement not only helped make the New York repo market among the most liquid markets in the world, but also intentionally helped to nurture non-bank securities dealers.

Asian central banks in the forex swap market vs repo market

Before the Asian financial crisis, Asian government bond markets tended to be small and illiquid, and repurchase markets in them were not well developed. Central banks used variations in reserve requirements to varying extents (Dasri (1990)). Open market operations were often conducted in short-term foreign exchange swap markets. These in effect served as the money market for currencies like the Singapore dollar and the Thai baht. Central bank operations not only recognised the liquidity of these markets, but also contributed to them.

Since the crisis, with the development of government bond markets in the region, the repo markets have gained liquidity. Central bank operations in repos in Malaysia, the Philippines, Singapore and Thailand have contributed to liquidity in these markets.⁶ Still, owing to limited central bank holdings of government paper, large needs to absorb liquidity have tended to be met by resorting once again to the foreign exchange swap market, as well as with central bank paper in some cases. Thus, Bank Negara Malaysia reports forward purchases of dollars of \$16.6 billion, the Bangko Sentral ng Pilipinas, \$9.6 billion, the Monetary Authority of Singapore, \$55 billion and the Bank of Thailand \$9.5 billion (net) at end June 2007.

The Bank of Thailand's choice of the tenor of its repo operations

If the choice to conduct operations in repo markets has furthered their development in recent years, then it would not be surprising if the maturity of the repos chosen for operations had an effect on market liquidity. In effect, the Bank of Thailand has conducted two natural experiments in the course of its inflation targeting period since May 2000. It first chose to use the 14-day repo as its policy rate and operating instrument in May 2000 and then switched to the overnight repo rate in January 2007. The immediate impact of both moves was to make the market more liquid at the chosen tenor.

The experiment is easily described. To assess the effect of the choice of policy rate and operating instrument on market liquidity, repo transactions at the chosen tenor and at other tenors were aggregated over a four-month window before and after the month of each change in operating procedures. The null hypothesis is that the change in policy had no effect on the distribution of market transactions by maturity of the repo.

The first move in May 2000 concentrated liquidity into the 14-day maturity, mostly at the expense of other term transactions, both 7-day repos and those with maturities of a month or over (Table 1). The share of 14-day repos more than doubled to over half. The Chi-square statistic confirms the “inter-ocular impact test” and rejects the hypothesis of the independence of the policy choice and the tenor of market transactions.

⁶ Faced with a shrinkage of government debt outstanding, the Reserve Bank of Australia and the Reserve Bank of New Zealand have to varying extents come to use foreign exchange swaps more. See Reserve Bank of Australia (2003) and Reserve Bank of New Zealand (2006).

Thai repo market turnover by maturity around May 2000

In billions of baht

	Tenor of repo transactions		Total
	14-day	Other	
4 months pre-May 2000	730	2,003	2,733
4 months post-May 2000	1,549	1,362	2,911
Total	2,279	3,365	5,644

Note: The Chi-square statistic for the independence of the choice of operating tenor and market turnover is 410.8, while the critical value for $p < .0001$ is 10.83.

Sources: Bank of Thailand; author's calculations.

Table 1

Nevertheless, overnight repos became the most transacted tenor, especially as interest rates were raised from mid-2004. Thus, one can interpret the shift by the Bank of Thailand to the overnight repo in January 2008 either as a response to this market development or as a response to certain central banks abandoning the 14-day repo as the focus of policy (Ho (2007)). However one interprets the policy move, it led to further concentration of liquidity in the overnight tenor (Table 2).

Thai repo market turnover by maturity around January 2007

In billions of baht

	Tenor of repo transactions		Total
	Overnight	Other	
4 months pre-January 2007	4,870	2,746	7,615
4 months post-January 2007	6,935	2,349	9,284
Total	11,805	5,095	16,900

Note: The Chi-square statistic for the independence of the choice of operating tenor and market turnover is 229.7, while the critical value for $p < .0001$ is 10.83.

Sources: Bank of Thailand; author's calculations.

Table 2

While the shift to the overnight repo can be interpreted as the response of operating procedures to market development, the two natural experiments provide strong evidence that the choice of operating procedures also shapes the development of markets. Choices within an operating instrument matter as well as choices across operating instruments.

2.3 Choosing monetary operations to further financial market development

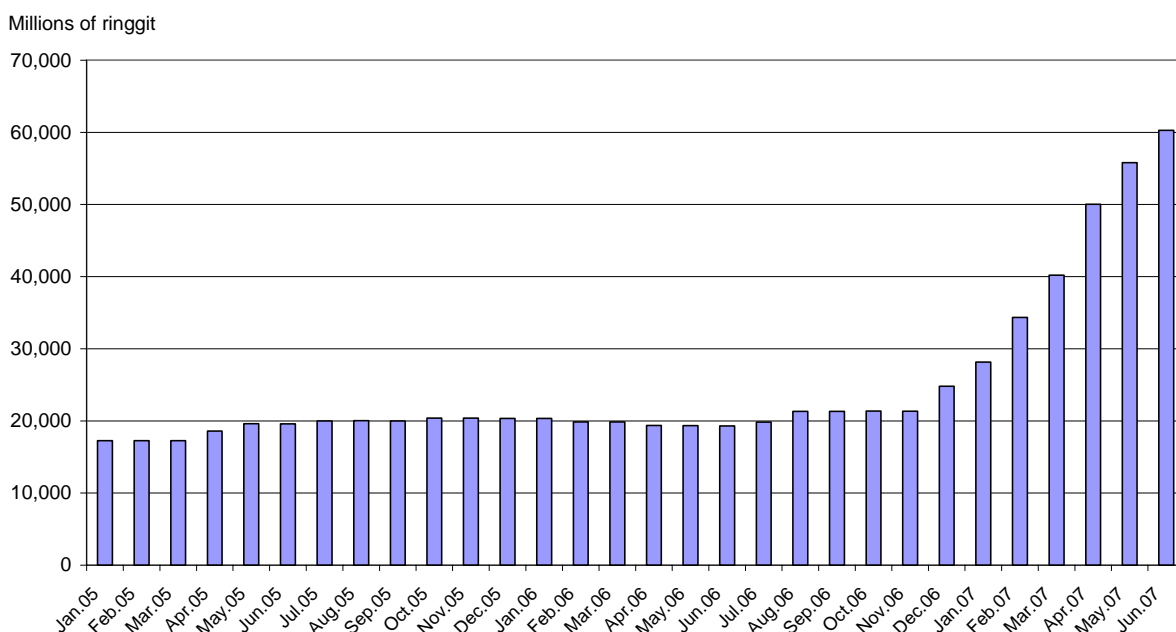
The syllogism advanced by this half of the paper can be simply put. The major premise is that the operations of a central bank confer liquidity on a particular market. The minor premise is that modern strategies for managing fiat money are silent on the composition of the balance sheet of the central bank. The conclusion therefore follows that central banks can choose monetary operating procedures in general, and operating instrument(s) in particular, in order to develop financial markets.

I contend that this conclusion applies to industrialised and emerging market economies alike. David Marshall's historical review (2002, p 46) concluded "The Federal Reserve used its choice of open market instruments to influence the growth of financial markets in ways it deemed useful for the public interest". More recently, the fine points of the Eurosystem's operating policy have been tweaked most importantly to remove the incentives for massive overbidding in regular operations (maintenance period timing, maturity of operations, see ECB (2003)). In addition, however, moves have been made to damp overnight interest rate volatility, including more frequent fine-tuning operations (ECB (2007)). Damping such volatility has more to do with accommodating market participants in the EONIA swap market than any inherent monetary policy interest. From a developmental perspective, this accommodation makes sense.

Two policies pursued by Bank Negara Malaysia provide examples of the choice of monetary instruments to further financial market development. The first concerns repos. As noted, a number of Asian central banks have depended more on repos to drain funds from the money market since the Asian financial crisis. However, the predominantly foreign assets held by these central banks have tended to place a limit on the available portfolio holdings of government paper that can be repo'ed out. Bank Negara Malaysia has borrowed government bonds from the buy and hold government provident fund that can be used in repo operations. Moreover, a comparison of the bidding in the resulting repo transactions with bidding at similar maturities for outright deposits with Bank Negara Malaysia revealed a preference for the repo over the outright deposit.

The second policy involves the substitution of Bank Negara Malaysia securities for outright deposits as a means to drain liquidity from the money market. This required a change in the law that had limited outstanding Bank Negara Malaysia securities in relation to its capital. The increase in the central bank paper outstanding since the new law went into effect has been dramatic. Outstanding amounts tripled in the first half of 2007 to over \$17 billion equivalent. The substitution of negotiable securities for short-term deposits with the central bank has contributed materially to the liquidity of the money market.

Bank Negara Malaysia bills and notes outstanding



Source: Bank Negara Malaysia Monthly Statistical Bulletin.

3. Financial market development as a constraint on monetary operations

The first half of this paper has argued that the choice of instruments and other aspects of a monetary policy operating framework affords policymakers the opportunity to advance the development of financial markets. At the same time, however, the development of financial markets constrains and challenges policymakers. The second half of this paper takes up these constraints and challenges. Constraints arise from the government and central bank balance sheets and from the growth of securities markets in previously bank-dominated financial systems.⁷ The challenge to a central bank is to align its operations appropriately with financial development.

3.1 Government and central bank balance sheets

Government and central bank balance sheets impose important constraints on monetary operations. The first affects the availability of “risk-free” assets (a concept that dates almost to the period when the Federal Reserve was pegging Treasury interest rates). The second affects the likelihood that the money market is in structural deficit or surplus, and thus the character of the modal monetary operation (injecting or draining) and the availability of domestic assets to use in reversed transactions.

The government balance sheet

A most important constraint is the size of the government debt, which under normal circumstances itself reflects the flow of past fiscal deficits or surpluses. Thus, quite apart from the real bills doctrine, the Federal Reserve’s initial choice – that is, before World War I – of operating instrument was constrained by the small size of the federal government’s debt. Some Asian central banks before the Asian financial crisis also had little in the way of government debt with which to operate. As noted, at the very beginning of the present century, many committee meetings took place and journal articles were written on the premise that the stock of US government debt would shrink and possibly force the Federal Reserve to resort to private paper.

Australia and New Zealand avoided the recessions and substantial foreign engagements that belied the fiscal expectations in the United States. Today, the prolonged fiscal surpluses of Australia and New Zealand have themselves posed challenges to the existing monetary policy procedures. The Reserve Bank of Australia (2003) has responded by operating in bank bills, much like the Federal Reserve once operated in BAs. The Reserve Bank of New Zealand (2006), by contrast, has preferred to cash up its money market with massive foreign exchange swaps in order to avoid taking on such private sector assets (though it will from September 2007 accept IBRD and EIB paper denominated in New Zealand dollars).

The central bank balance sheet

The most economical, or perhaps minimalist, central bank balance sheet, that of the Federal Reserve, is not much larger than the monetary base.⁸ That is, liabilities consist of outstanding currency and a smaller sum of bank reserves. The growth of outstanding

⁷ For a treatment of the effect of changes within the banking system, see Archer (2006). This section does not touch on the implications of the growing importance of derivatives. See Hohensee and Lee (2006) and BIS (2005, 2007).

⁸ See Papadia and Würtz (2007) on the “lean balance sheet”.

currency is accommodated by the Federal Reserve's purchases of assets. The structural balance in the money market associated with an economical balance sheet is likely to be a deficit. That is, the central bank's burden is likely to be to provide enough liquidity to the money market to accommodate cash and reserve demand (including that for clearing). Such an economical central bank has cash-needy entities (eg securities firms) as its natural counterparts.

In many of the economies of East Asia, by contrast, the central bank's abundant assets consist of foreign assets that stand at a multiple of the monetary base. Thus, the structural balance in the money market is likely to be a surplus and the central bank's burden is likely to be to drain enough liquidity from the money market to prevent interest rates from plunging toward zero. In doing so, it will find it problematic to conduct reversed transactions against domestic assets like government securities, owing to its lack of holdings of the paper. Such a central bank has cash-rich banks and institutions as its natural counterparts.

Cooperation between the debt manager and the central bank

Government and central bank balance sheets impose less of a constraint if there is thorough cooperation between debt managers and central bankers. Considerable cooperation in East Asia and the Pacific has been evident in Singapore, Australia and India. In all three the government has issued (Singapore and India) or contrived to keep in existence (Australia) government debt in excess of the needs imposed by the public sector borrowing requirement.

McCauley (2003 and 2006a) develops the argument for close cooperation between the debt manager and the central bank.⁹ This has been adopted in India, where, notwithstanding a fiscal position that is only approaching long-run balanced growth, the government has agreed to overfund its fiscal needs. It thereby makes its debt available to the central bank to sterilise the effect on base money of intervention to resist the appreciation of the rupee. This has resulted in the filling in of the government yield curve, since the government has dropped its previous reluctance to issue short-term debt in view of its having a readily realisable financial asset as the counterpart of the overfunding (a blocked account at the Reserve Bank of India).

3.2 The importance of securities markets: the view from corporate balance sheets

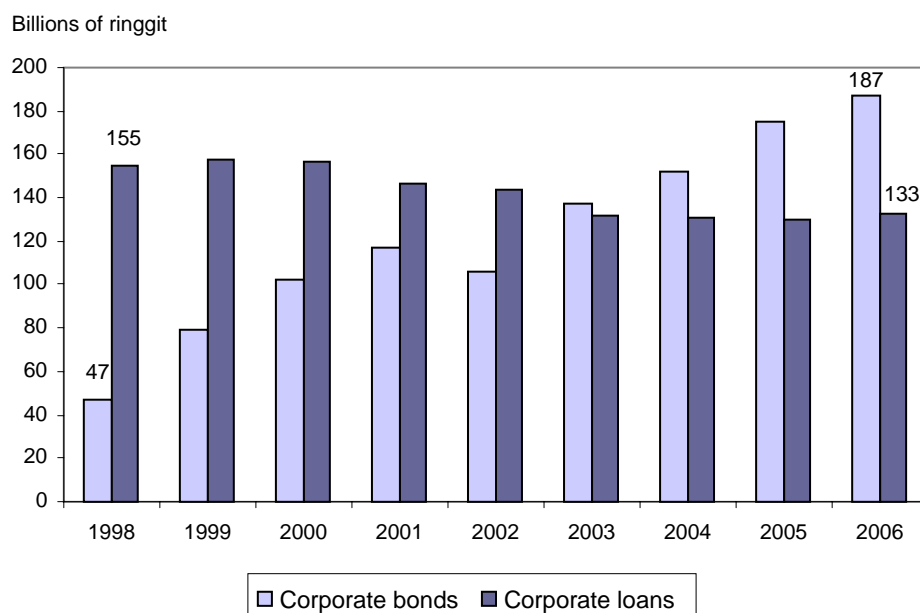
Another constraint on a central bank's choice of operating instrument is the importance of the securities markets in the overall financial system. If the flow of funds from the household sector to the non-financial business sector, or within the non-financial business sector, takes place primarily through a combination of institutional investors (mutual funds, insurance companies and pension funds) and securities markets, then operations confined to the banking system may not be transmitted effectively.

Since the Asian financial crisis, bond markets have grown substantially in the region (Jiang and McCauley (2004)). Especially in Malaysia and Korea, not only have outstanding government bonds grown, but outstanding corporate bonds have also seen rapid growth (BIS (2006)). In Malaysia in particular, large firms rely more on corporate bonds than on bank loans. Under these circumstances, for instance, an increase in reserve requirements might just accelerate the shift from reliance on bank borrowing to reliance on bond issues rather than slow overall credit flowing to the corporate sector.

⁹ See Friedman and Schwartz (1963, pp 634–636) for an interpretation of the “bills only” controversy in terms of the cooperation between debt managers at the Treasury and the Federal Reserve.

More generally, the cost of debt capital for the larger firms in the corporate sector no longer depends solely on the pricing of bank loans. Large firms' decisions regarding the holding of inventories, the acquisition of land, and the purchase of capital equipment should be seen as increasingly a function of short-term paper and bond yields.

Size of corporate bond market against corporate loans¹



¹ Excludes loans to small and medium-sized enterprises.

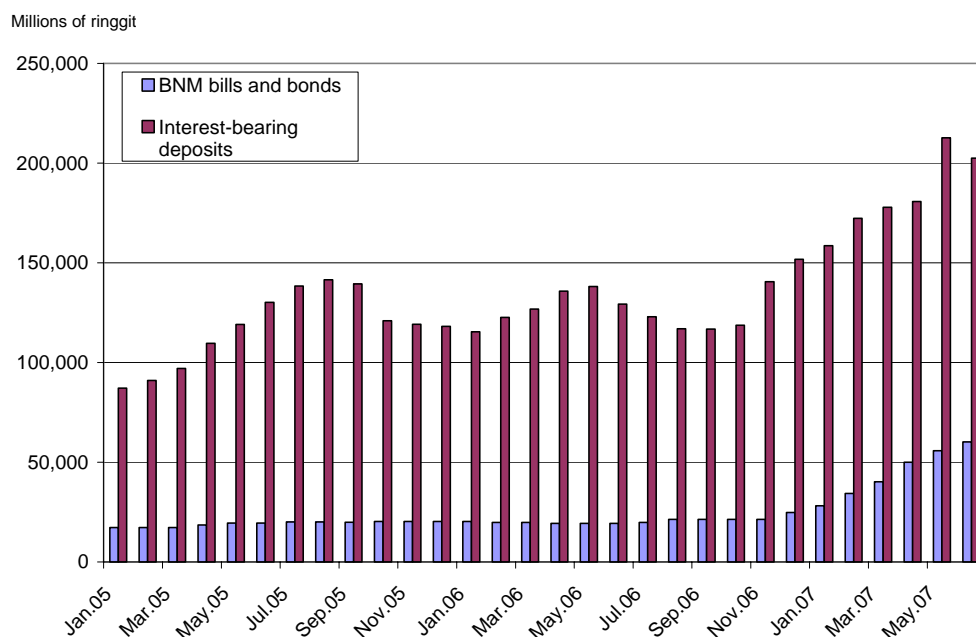
Source: Bank Negara Malaysia (2007, p 92).

3.3 Aligning monetary operations to financial market development

In a bank-dominated financial system, the central bank can conduct monetary operations with banks and remain confident that its policy impulses will be transmitted to the banks' customers, both depositors and borrowers. As securities markets gain in importance, however, the central bank faces the challenge of aligning its monetary policy operations with the altered flow of funds in the economy.

This challenge can be visualised by a juxtaposition of the graph above, showing the reliance of large firms in Malaysia on the bond market, with the graph below, showing the security and deposit liabilities of Bank Negara Malaysia. The security liabilities consist of Bank Negara Malaysia bills and bonds and these showed an expansion in 2007 as noted above. The deposit liabilities are meant to capture the stock of outstanding operations in which banks in Malaysia tender for outright deposits at the central bank. These daily operations, for periods as short as days and as long as months, are the workhorse draining operation of the central bank. The outstanding stock is approximated by taking the banking system's holding of deposits with the central bank (leaving the government's deposits to one side) and subtracting required and excess reserves. The remainder can be taken as a proxy for the interest-bearing deposit liabilities of the central bank, which can be appropriately compared to the interest-bearing central bank securities outstanding. Both serve to drain liquidity, but one operates through bank balance sheets, and the other through the robustly expanding bond market.

Security and deposit liabilities of Bank Negara Malaysia



Source: Bank Negara Malaysia, Monthly Statistical Bulletin.

As can be seen, 2007's increase in central bank bills and bonds has brought the security liabilities up to over a quarter of the deposit liabilities. Moreover, since the juxtaposition has not taken into account any repo transactions, the security-related draining operations are not fully captured by this comparison. It is fair to conclude that progress has been made in bringing central bank operations into alignment with the development of financial markets in this case.

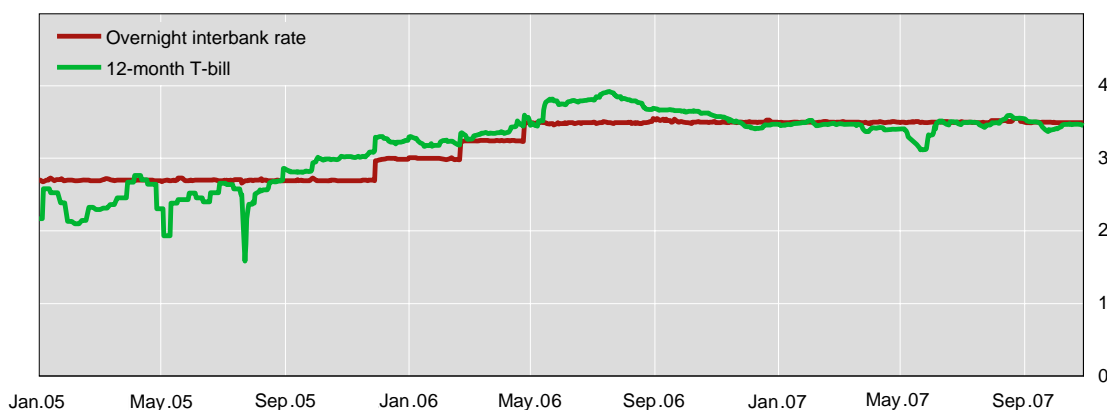
Deeper securities markets make it less likely that bank interest rates and those on short-term securities will become unhinged again. This was the experience in 2005 in the lead-up to the unpegging of the ringgit in July 2005. A great deal of speculative capital flowed into Malaysia's financial markets in (a correct) anticipation of a move and in (an incorrect) expectation of a substantial immediate gain in the event of a move. Some of these funds were parked in short-term securities, especially at the short end of the Malaysian government securities market and in Bank Negara Malaysia bills. As a result of the weight of non-resident demand, the interest rates on such paper fell noticeably below the Bank Negara Malaysia overnight policy rate (see graph below). In effect the entire stock of such paper was acquired by non-residents, so that the higher opportunity cost of the banks able to participate in central bank draining operations became irrelevant to the pricing of the government and central bank paper in the market. Thus, the rates enforced by central bank operations in the interbank market lost their effect on the yields prevailing in the market for short-term government securities.

More balance in the central bank operations between bank deposits and securities cannot prevent a recurrence of such an anomalous pattern of short-term interest rates, given the huge scale of capital flows that are being experienced in the region. The larger the stock of central bank paper, however, the less likely a recurrence becomes. This observation should not be read to suggest that there was a large loss associated with the disconnect between bank and short-term security interest rates. The speculative pressure did not extend far out along the yield curve, so that borrowing conditions for Malaysian firms were not greatly affected. And the anomalous pattern of rates did not last long. Speculative investors threw in the towel in August as it became clear that there would not be an uncontrolled pop of the exchange rate. Indeed, there was a huge outflow of funds from Malaysia in the second half of

2005, which can be seen in the graph above as a fall in the outstanding draining operations, the counterpart of a substantial decline in foreign exchange reserves. This set of events, of course, had some parallel in China, which also depegged in July 2005.

Money market interest rates in Malaysia, 2005–2007

In percentage points



Sources: Bloomberg; CEIC.

4. Conclusions

Monetary policy operating procedures and instruments offer central banks an opportunity to contribute to the development of financial markets. This may be most true for central banks in emerging markets, but the opportunity cost of holding the paper for the banks able to participate in central bank draining operations became irrelevant to the pricing of the paper in the market. The degrees of freedom in choosing instruments, given the lack of constraints flowing from the dominant strategy of managing fiat currencies to achieve low inflation and stable economic growth, can be put to good use.

At the same time, the state of financial development constrains the choice of monetary operating procedures as well. When the debt stock of the government is small or the foreign assets of the monetary authority are large, monetary operations may end up with a character not observed elsewhere. Whether the debt stock of the government can be expanded to play a major role in the monetary operations of a central bank with large foreign assets depends on the particular circumstances of each country, and especially the relationship between the ministry of finance and the central bank. With or without this help, the central bank faces the challenge of aligning its operations to the main trends of financial development, including the growth of institutional investors and securities markets at the expense of bank intermediation.

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