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**Making Monetary Policy Work in China:
A Report from the Money Market Front Line**

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Summary

This paper examines the current state of monetary policy in China: its institutions, effectiveness and limits. It explains the reasons why the transmission mechanisms of monetary policy do not yet work effectively in China and some of the broad policies that are required in order to meet this challenge. The problem is primarily explained by excess liquidity in the banking system and a lack of investible debt instruments. The paper also assesses and measures the PBoC's three-pronged efforts to sterilise FX inflows (bill issuance, reserve requirement increases and window guidance), estimating that the authorities managed to sterilise some 47% of inflows in 2004. However, analysis of the flows involved suggest that proportionally more are being added to base money at present, and that the domestic costs of sterilisation are rising. It also shows that FX inflows are undermining China's monetary policy independence, causing money market rates to fall, undermining bank profitability as well as causing other micro-economic problems.

Keywords: China, monetary policy, banking system

JEL codes: O53, E52

Thanks to Rong Fan for excellent research assistance and to Tai Hui for working with me on some of the data. This paper does not reflect the views of Standard Chartered Bank or SCB Global Research. It does, however, report research that has been previously published by SCB Global Research. A list of SCB research on China's monetary policy is provided at the end, and is cited in the text where appropriate.

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Introduction

At the core of the modern market economy are central banks and their role of adjusting the price of money to influence macro-economic demand. Ever since the demise of Keynesian demand-management in the 1970s, monetary policy has been the main tool by which western economies have been managed. As aggregate demand strengthens, and inflationary pressures build, a central bank will move to raise the cost of the funds that banks borrow and lend in the money markets. Banks, sensitive to this rate rise, then raise the cost of their own lending. Facing higher borrowing costs, investors scale back their investments and consumers their spending, causing aggregate demand to weaken. In this way, money markets are one of the key links between a country's financial system and its real economy.¹ If China is to develop a mature market economy, then it is going to have to build its money markets and the institutions required to facilitate effective monetary policy.

This paper examines the current state of monetary policy in China: its institutions, effectiveness and limits. It is divided into three main parts. The first briefly introduces monetary operations in mature economies. The second analyses the development of China's money markets, the practice of monetary policy in China since it began in 1998, and the challenges the PBoC faces in using monetary policy to manage macro-economic demand.² The third section examines the impact of current exchange rate policy on the money markets and monetary policy.

1. Monetary policy in market economies

Since the 1980s, as the concepts of the natural rate of unemployment and rational expectations have been widely accepted, and the lessons of the boom-bust experience of the 1950s-70s have been digested, central banks around the world have learnt to concentrate on controlling money supply as the key means of preventing inflation.³ As a rule of thumb, assuming that monetary velocity is constant, central bankers aim to supply enough new money into the economy so that

¹ For a general introduction, 'Transformation to open market operations: developing economies and emerging markets', S. Axilrod, IMF, *Economic Issues*, No. 5, 1996. Standard Chartered Bank produces a quarterly *China Money Monitor* which tracks key developments in this market.

² See Suggested Reading at the end of this paper for SCB Global Research on China's monetary policy.

³ In the medium-to-long term, most economists now accept Milton Friedman's claim that nothing but a sustained increase in the money supply has the power to cause inflation. The theory of the natural rate of unemployment posits that a non-zero rate of unemployment exists in an economy in equilibrium (i.e. output at its natural rate and steady inflation). If a central bank increases money supply to push demand above potential in order to decrease unemployment, then inflation will rise. Policy-makers should therefore put zero weight on employment and solely aim to maintain monetary stability.

the increase in money equals the combined increase in demand for goods and services (GDP) and inflation.⁴ The difficulty is that they cannot directly control the money supply.⁵

Money can grow in three main ways. First, through the bank/deposit multiplier. Banks take new deposits and lend them out; borrowers then deposit their new loans at banks; and new loans are then made etc. This process is not infinite if the banks have a regulated required reserve ratio, a prudential requirement to put a certain percentage of deposits on deposit with the central bank.⁶ The addition to the money supply from an initial \$100 increase is \$1000 if the reserve requirement is 10%.⁷ Second, money can be injected into the economy from overseas. If the trade account is in surplus, and the exchange rate is kept below its equilibrium level by official intervention, there will be a net inflow of foreign exchange into the economy. Exporters exchange their FX receipts for local currency at commercial banks, which the banks then pass to the central bank in exchange for the creation of local currency assets on their balance sheets. Base money supply is thus increased. In order to prevent inflation, the central bank must 'sterilize' these inflows in order to eliminate their impact. It might do so by issuing central bills, a subject to which we return below. Third, money can grow through government borrowing. If a government issues securities to fund a deficit, and the private market refuses to purchase them the central bank can be obliged to step in and buy these securities. It might do so by printing new money.⁸ Such an action is often inflationary – and, indeed, was the root of inflation in Latin America and Africa during much of the last century.⁹

⁴ Assuming that money velocity is constant, change in real GDP + change in inflation = change in M2.

⁵ There are different approaches to this problem. Some central banks focus on tracking and targeting monetary aggregates – the ECB tracks M3, for instance. In contrast, some, like the Bank of England, use explicit inflation targets, believing that tracking and targeting money supply is too difficult and unreliable. Practice varies too across developing countries. Poland and Mexico use banks' net domestic assets as an intermediate target, India and Malaysia target M3, the Philippines and Brazil base money. 'Transformation to open market operations: developing economies and emerging markets', S. Axilrod, IMF, *Economic Issues*, No. 5, 1996.

⁶ Many countries now operate reserve requirements, although the UK and HK are examples of systems that do not.

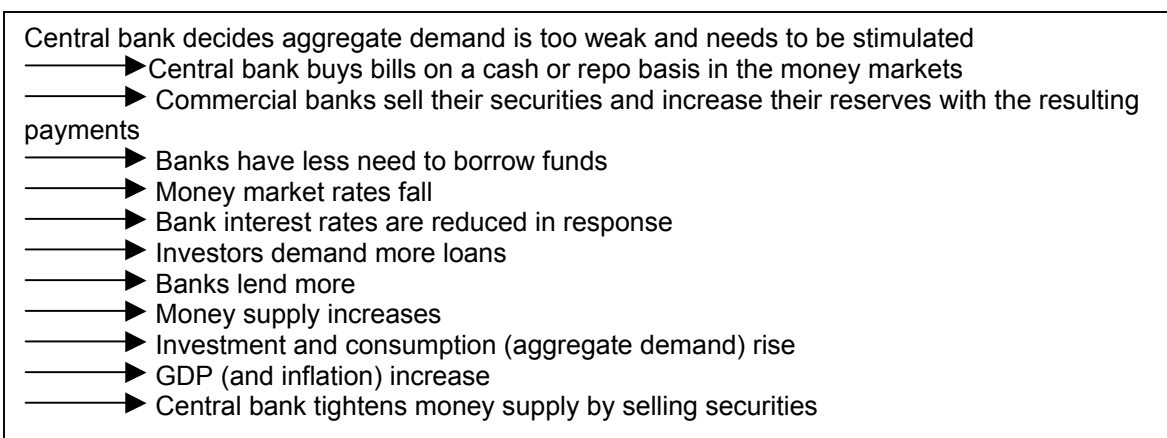
⁷ If a bank takes \$100 in new deposits, and has a reserve requirement of 10%, it can lend out \$90 but must put \$10 on reserve with the central bank. The new borrower then deposits the \$90, and the process is repeated: \$9 is kept as reserve and \$81 is lent out. The process continues. The total change in deposits is given by the initial change in the money supply divided by the reserve ratio.

⁸ Chowdury cautions that it is best if the authorities issue bonds, since if it issues bills then these can be used by banks as a liquid assets upon which to advance credit, thereby increasing money supply). The author believes that PBoC bills cannot be used in this, but at the time of writing was not clear why.

⁹ In addition, public debt issuance also usually leads to the crowding out of private investment since interest rates will rise as more debt is issued.

Although a central bank cannot directly control money supply, it can influence these three avenues of money creation. It can use three main tools to do so. First, open market operations (OMOs). These involve the central bank buying (selling/issuing) securities, and thereby injecting (withdrawing) base money into (from) the financial system.¹⁰ It can do so on a cash or repo basis. This is the main monetary policy tool of central banks in mature economies. If the central bank determines that aggregate demand is excessive and inflation is a threat, it will attempt to restrict liquidity in the money markets through issuing bills. The cost of the banks' funds rises as money market rates rise and banks usually price up their longer-term loans in response to money market rate hikes.¹¹ Diagram 1 shows the reverse type of OMO in action: operations designed to stimulate the economy through injecting base money into the banking system.

Diagram 1: How a central bank stimulates the economy through OMO



Second, varying the price at which banks can borrow capital from the central bank. This is the most visible of a central bank's tools since the central bank's own rate (known as the discount rate in the US) is released regularly and is widely discussed before and after its release.¹²

¹⁰ What type of securities the central bank chooses to trade is important. If it buys securities (Treasury notes, Treasury bills or notes) from the market, then it is adding to commercial banks' reserves permanently. In the US, such purchases signal that the Fed is ambitious to boost liquidity on a permanent basis. If, however, the central bank buys on a repo basis, then it adds to commercial bank reserves only temporarily, thus signalling its ambition only boost liquidity in the short term.

¹¹ Because of arbitrage, the money market rate will usually approximate to the rate at which the central bank lends. In the US case, the federal funds rate approximates to the rediscount rate set by the Fed. The money market rate is the banks' marginal borrowing rate and banks' lending rates are set using it as a base. For instance, in a mature banking market a bank's prime rate, the rate at which it lends to its best corporate clients will be set at about 200 bps above the base rate. As a result, the best barometer for working out what a central bank is doing (tightening or relaxing money supply) is the money market rate. If it is rising the central bank is probably withdrawing liquidity from the system.

¹² How a central bank influences money market rates varies around the world. Some central banks lend at below the market rate when they want to lend, thereby encouraging borrowing when the borrowing facility is available. Other central banks, rather than turn the lending facility

However, despite the publicity attached to these decisions, this tool is not used as much as OMO, which directly impact money market rates on a daily basis. The third tool is forcing banks to hold more or less money on reserve with the central bank. Manipulating the reserve requirement adjusts the monetary base – if banks have to hold more money on deposit with the central bank then they have fewer funds available for customer loans.¹³ A rise in the reserve requirement lowers the money multiplier. However, adjusting this rate is not a commonly used tool of monetary policy any longer.¹⁴

For OMOs, the rediscount rate and the reserve requirement to function effectively, however, banks must be sensitive to the price of the central bank's funds and the money market rates. The central bank therefore has to – as a matter of permanent policy – restrict liquidity so that banks must borrow from the central bank or other banks to meet their reserve requirements and other needs.

2. China's monetary policy and money markets

In 1998, the national bank credit quota was scrapped and the PBoC in theory has had to rely on adjusting its own balance sheet to manage the monetary base.¹⁵ Since then, the PBoC has tried to develop the influence of the interest rate. The tools for influencing money creation in China are now mostly present. However, they are not yet as effective as they need to be to enable the PBoC to run an effective monetary policy. Consider the three main ones: OMO, discount rate and reserve requirements.

Open market operations in China began in October 1998, when the PBoC started cash trading of bonds. China's money markets have developed rapidly and their basic make-up is explained in

on and off, adjust the cost of lending – the lower the discount rate, the more borrowing that takes place. For OMOs to be effective, there needs to be a limit on the central bank's discount window, either via limits on volume or penalty-level rates. Some central banks, like the old Bundesbank, operate two discount rates, one for the money it wants to lend, and another higher rate ('the German Lombard rate') for banks that need to borrow as a last resort. The ECB now has three rates: one for refinancing operations (i.e. normal liquidity), a 'last resort' rate and a 'deposit rate' for excess reserves deposited at the ECB. The PBoC has a similar structure of three rates. Since 1997, the BoE has provided liquidity to the banks directly through gilt (Treasury bond) repos. The BoE stands ready to buy and sell gilts on a short-term repo basis, with the margin between purchase and re-purchase prices set to reflect its target interest rate. Like other central banks, the BoE sets out to create a shortage of liquidity to force banks to borrow from it at the repo rate.

¹³ Reserve deposits pay either low or zero interest rates. It is argued that a minimum reserve ratio reduces the volatility of money market rates, since without this ratio banks would lend out more in response to an upturn in macroeconomic demand, which would in turn necessitate more OMOs.

¹⁴ Variable reserve ratios were, however, common in pre-euro Europe. In a different approach, before 1982 the BoE required commercial banks to make 'special deposits' as well as 'supplementary special deposits' at the BoE.

¹⁵ The PBoC's quarterly reports on the financial system, as well as its more recent publications on open market operations were invaluable as sources for much of this section.

Box 1 below. At first the PBoC only engaged in one OMO a week.¹⁶ In the early days, cash bond trading was the most common means of adjusting the monetary base.¹⁷ After a short period, this was replaced by bond-based repo transactions since these had the advantage vis-à-vis bonds of affecting money market rates (and not impacting on the bond market). On June 25th 2002 the central bank started using reverse MoF- bond-based repos to cope with new FX inflows. However, by September 2002, the PBoC had run out of bonds upon which to make repo transactions. To resolve this, the central bank determined that all outstanding repo contracts issued between June 26th and September 24th would not be honoured as such, but would be converted into a new instrument, PBoC bills. The conversion resulted in bills worth CNY193.8bn (USD23.3bn), which appears on the central bank's balance sheet in September 2002. The first auction of 'new' central bank bills took place in May 2003 and since then the market has grown substantially. From February 25th 2003, the central bank has engaged in two (or more) OMOs a week.¹⁸ In comparison to repos, bills can be traded, which improves liquidity, and regular bill auctions allow an interest rate benchmark to be formed. The PBoC has developed the primary bill market to include 52 dealers, including banks securities companies, insurers, rural credit co-operatives etc. PBoC bill auctions use both volume- and rate-based bidding. The PBoC is reported to have a dedicated OMO trading room managed by the PBoC's Monetary Policy Division.¹⁹ It has also developed a liquidity management system, which now provides a daily update on banks' liquidity positions.²⁰ Table 1 summarises the PBoC's OMOs since 1998.²¹

¹⁶ This introduction to OMO in China relies on 'Guanyu 2002 nian remin yinhang gongkai shichang yewu qingkuang', Shui Ruqing and Sun Guofeng, *China Money Market*, April 2003, pp. 24-28.

¹⁷ 'Jinnian gongkai shichang yewu caozuo shiwu tanxi', Zhao Nanyue, *China Money Market*, April 2003, pp. 34-35.

¹⁸ On May 12th 2004, the PBoC announced the start of repo sales to deposit-taking institutions (including commercial banks and rural credit co-operatives) on Thursdays.

¹⁹ The PBoC's Business Management Department manages OMO cash settlement while the Central Treasury Bond Registration and Settlement Company looks after bond settlement.

²⁰ The PBoC also has to cope with the liquidity effects of Mainland IPOs. At each IPO, those who wish to buy shares deposit money at a bank, and these funds are then frozen until the successful IPO share applicants are chosen, shares are bought and the money that was unsuccessful in the IPO auction is released. In September 2001, China Telecom issued shares, and the IPO application froze some CNY200bn (USD24bn) in funds, causing the seven-day repo rate to rise to 2.34%. The PBOC responded by organising a fixed interest rate/variable volume auction of bills, signalling its intention to stabilise rates. By the end of September, the seven-day repo rate was back down to 2.25%.

²¹ In addition to monetary policy, the PBoC has also used OMOs to assist the MOF. On May 23rd, the MoF issued CNY26bn worth of 30-year Treasuries. The market was unable to properly price such a long-term issue, and the issue rate, 2.9%, turned out to be too low. Underwriters of the bond could not then sell their holdings without realising large losses. In September the PBoC stepped in and bought bonds with face value of CNY10bn for CNY7.8bn. The underwriters realised a capital loss of only 2%. 'Guanyu 2002 nian remin yinhang gongkai shichang yewu qingkuang', Shui Ruqing and Sun Guofeng, *China Money Market*, April 2003, pp. 24-28.

Table 1: Open market operations

	<i>Released base</i>	<i>Withdrawn base</i>	<i>Net base money effect</i>
5-12/98	176	107	+70
1999	708	526	+181
2000	447	573	-127
2001	825	873	-47
2002	185	305	-120
2003	1,024	1,223	-198
2004	1,218	1,997	-669

Source: PBoC Monetary Policy Reports, Author, Shui and Sun (2003)

Second, the discount rate, the rate at which the PBoC lends into the money market. On March 25th 2004, the PBoC introduced 'floating rate' central bank rediscount lending. In other words, the PBoC now has right to set the discount rate without having to seek State Council permission each time. At the same time, the PBoC added 63 bps to the benchmark discount rate for financial institutions, and 27 bps to the standard rate to take the central bank's core rediscount rate to 3.24%. Floating rate rediscount lending will be phased in over three years for the rural credit co-operatives.

Third, the reserve requirement. The PBoC reduced this ratio in the late 1990s as table 2 shows, in an attempt to stimulate credit growth and to give the banks more flexibility in how they managed their funds. At the same time, the central bank has steadily reduced the rates it pays on reserves, both required and excess, as table 3 shows, in an attempt to encourage banks to lend into the money markets rather than place their excess funds on deposit with the central bank. On April 25th 2004, the PBoC adopted a differentiated reserve ratio system, meaning that second-tier banks, with capital adequacy ratios or asset quality etc. below certain standards would have to hold 8% reserves (compared to the standard level of 7.5%). Rural and urban credit co-operative were exempted from this rule for the time being. Ma and McCauley (2004) note that by mid-2004, 38 second-tier banks were subject to the new higher level, affecting about 10% of deposits in the system.²²

Table 2. China's banks' required reserve ratio, %

	<i>RRR</i>
1985-86	10
1987	12
1988-98	13
1998	8
1999-2002	6
2003	7
2004	7.5

Source: PBoC

²² Ma and McCauley (2004).

Table 3. Interest rates paid on required reserves, %

1990.8.21	N/a
1991.4.21	6.12
1993.5.15	7.56
1993.7.11	9.18
1995.1.1	9.18
1995.7.1	9.18
1996.8.23	8.82
1997.10.23	7.56
1998.3.25	5.22
1998.7.1	3.51
1998.12.7	3.24
1999.6.10	2.07
2002.2.21	1.89
2003.12.21	1.89 (with new, lower, rate on excess reserves)

Source: PBoC

Note: Before December 2003, there was only one interest rate, 1.89%, for both required and excess reserves. After this date, however, while this rate was maintained for required reserves, excess reserves were paid a new, lower rate of 1.62%. On March 17th, the rate was lowered again to 0.99%.

Box 1. China's money markets

The inter-bank system (run by the National Interbank Funding Centre) hosts three major markets.²³

1. The interbank CHIBOR (China interbank offered rates) market is the core money market and is where banks lend funds among themselves for their liquidity needs.²⁴ Lending terms vary from overnight to four months, with trading concentrated in the one to seven day range.²⁵ The seven-day loan is the CHIBOR market's benchmark. For lending of above four months, the PBoC recently allowed interbank loans to be negotiated on a bilateral basis. These can be arranged through the inter-bank market system.

2. The interbank bond market has developed into China's largest bond market since its establishment in June 1997. This is where the PBoC bills trade. Since April 2003, the PBoC has issued bills of 3, 6 and 12 months, as well as a small number of three-year bills. Some PBoC bills, as explained below, appear not to trade here, however. This is a very actively traded and liquid market, supported by the constant supply of new bills. PBoC bills usually offer higher rates than

²³ Xie Duo, 'Analysis of the development of China's money market', *China & World Economy*, No. 1, 2002.

²⁴ The national interbank lending system was formally established in January 1996. In its early days, the lending and borrowing banks would agree a rate below which the PBoC's upper limit. In June 1996, the PBoC eliminated the upper limit and allowed rates to be set by the banks. Since 1998, the PBoC has moved to push most trading onto this system. 'Zhongguo huobi shichang de chengjiu he fazhan fangxiang', Shen Bingxi, *China Money Market*, May 2004, pp. 22-24.

²⁵ In the early 1990s, the interbank market was abused by trust and investment and securities companies to gain funds for real estate and other investments. Since 1996, the PBoC has attempted to regulate and standardise the market, including forcing all transactions onto the electronic trading system and introducing limits on borrowing for banks to four months, and to a defined proportion of their balance of deposits, and to NBFIs for seven days and to a defined proportion of assets. It has thus evolved from a NBFIs lending channel to a market for short-term liquidity for banks and NBFIs.

MoF paper (by some 30-40bps in recent months), but are subject to the 33% income tax on profits, which means the returns to PBoC and MoF instruments are more or less equal.²⁶ In addition to PBoC bills, the MoF, the policy banks and the banks issue debt into this market. Xie Duo notes that the interbank bond market has allowed banks to diversify their assets into bonds (thus allowing them to reduce their deposit-loan ratio), has facilitated the creation of a yield curve, and has made banks more sensitive to the PBoC's OMOs.

3. The bond repurchase (repo) market is a market in short-term borrowing, in which bonds are lent in return for funds for a defined period of time at a defined rate.²⁷ The repo market tends to be less volatile and more liquid than CHIBOR market. Since 1997, the repo rate has also been set by the market and the most active contracts have terms of 1-7 days.²⁸ The seven-day repo is also used as a benchmark. There are now two types of repo contract. Collateralised (*zhiyashi*) repos do not entail a change in the ownership of the bond. These instruments are designed for banks' liquidity management. The sell-short (*maiduan*) repo has a term of 1-3 months. In this contract, ownership is transferred at the depository. This allows the borrowed repo to be sold short by its temporary owner, before it is returned to the original owner at the end of the repo's term. This market, still in its infancy, is designed to be a trading market. In theory it allows for the development of an interest rate swap market, where hedging instruments against interest rate movements are required.

4. The inter-bank system also facilitates the trading of the CNY against four major currencies and, introduced on May 18th, a new platform for the trading of eight currency pairs. The CNY pairs are all traded in a very narrow band around the CNY/USD peg.²⁹

5. A fourth inter-bank market made up of discount bills is now beginning to be standardized and developed. There are two types of drafts, commercial drafts and bank drafts. PBoC sets rediscount rate (currently 3.24%) for these drafts. Banks can take these drafts and sell either to PBoC or to other commercial banks (with discount prices which make up for lack of IR).

How effective have OMOs been? In the late 1990s, there were obvious limits to the effectiveness of PBoC's attempts to stimulate the economy. After OMOs began in May 1998, not only was base money released (see Table 1), but also the banks' reserve requirement was lowered, from 13% to 8% in 1998, and again to 6% in 1999. However, there was little macro-economic effect – credit growth continued to decline from mid-1998 on. Things worsened in 2000, when annual loan growth slowed to 5%, the lowest rate in six years. As chart 1 shows, domestic credit growth endured a steady decline through the 1996-2002 period.

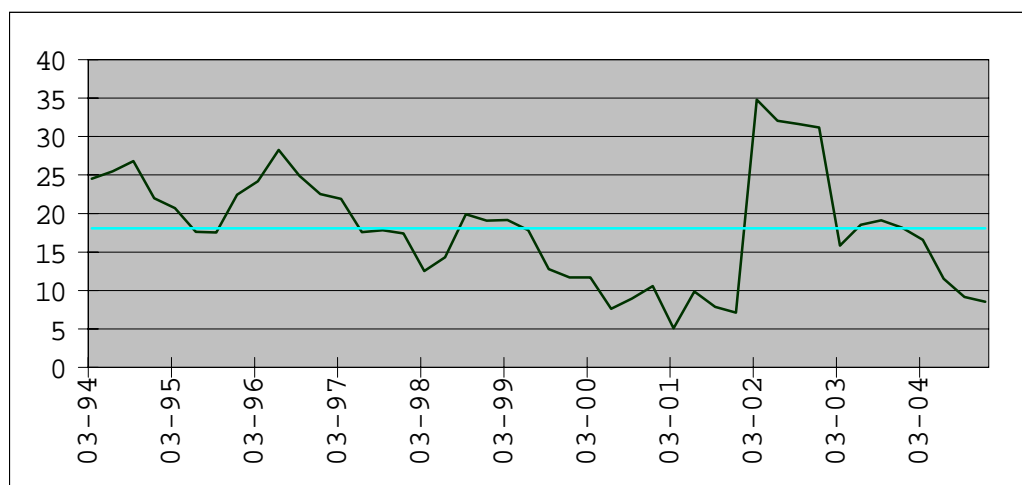
²⁶ It is unclear if PBoC bills carry a government guarantee: the market assumes they do, but it is unclear if this belief has a legal basis.

²⁷ Bond repo trading began in 1991, but since June 1997 has been split into two markets: - the interbank market facilities repo trading by bank and some NBFIs, and the Shanghai Stock Exchange hosts NBFIs and corporate repo trading.

²⁸ Large banks find it difficult to set rates for above 7 days and appear to be reticent to lock up liquidity for such extended periods.

²⁹ See 'Onshore FX market development and the CNY', SCB Global Research, May 13th 2005.

Chart 1: Domestic credit growth, 12mma, and simple average, %



Sources: SCB Global Research, CEIC

In the second half of 2001, it appears that the PBoC had to resort to administrative suasion, reportedly instructing the banks to boost lending. This, combined with more stimulative fiscal policies, had some effect on the macro-economy. By early 2002, credit and M2 growth had picked up dramatically. However, with a domestic boom underway, and large FX inflows, by 2003, the PBoC was facing the opposite challenge: calming aggregate demand and slowing credit and monetary growth. In early 2003 it began implementing an increasingly contractionary OMO stance. This took time to feed through to the market, however, and required, again, market as well as administrative tools to be used. In August 2003, the PBoC announced a rise in the reserve requirement and then began 'window guidance'. This had some effect. However, in March-April 2004, with high-level political support and the introduction of the macro-economic adjustment policies, money supply tightened significantly and by June yoy M2 growth was below 16%. Domestic credit growth also fell, to 8.5% by the fourth quarter (on a 12mma basis, see chart), from a peak of 34.8% in March 2002. How this was achieved is examined in more detail below. Here, let us examine three reasons for the weakness of OMOs.

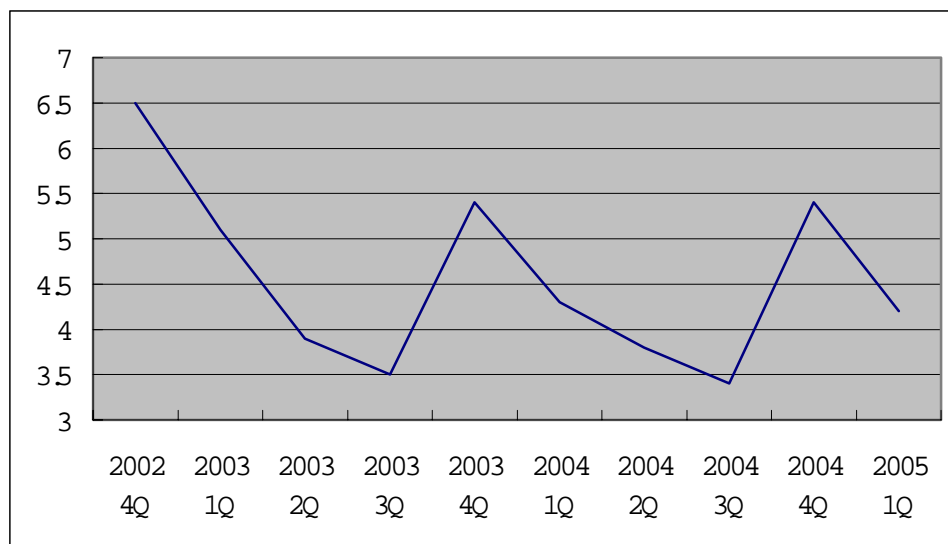
1. Banks are not very sensitive to the PBoC rediscount and money market rates. One reason for this is high levels of excess reserves, those deposits held by the commercial banks at the PBoC in excess of the mandatory 7.5% reserve requirement.³⁰ In the United States, banks' excess reserves are only 1-2% of deposits, since the Federal Reserve usually manages to keep liquidity in the banking system tight.³¹ Flush with cash, most Chinese banks do not need to borrow from the money markets and are therefore not sensitive to money market rates. The

³⁰ See China Money Monitor, SCB Global Research, April 2005.

³¹ In such circumstances, commercial banks have to borrow from the Fed, and so are sensitive to the Fed's overnight lending rate.

PBoC has worked to reduce excess reserves since 1996, and they fell from 9% in 1998 to 6-7% in 2001.³² Since then, however, progress has slowed, and they appear to have bottomed out, although with some seasonal variation. Year-end rates were 6.4% in 2002, 4.4% in 2003 and 5.3% in 2004, as chart 2 shows.

Chart 2. Excess reserves ratio of all banks, %



Sources: SCB Global Research, PBoC, BIS

Why have the levels of excess reserves remained high? This reflects high levels of excess cash on the banks' balance sheets (which are simply parked at the PBoC at the end of each day). There are a number of reasons for this:³³

- The large volumes of liquidity in the banking system in recent years. This has been exacerbated by FX inflows (which boost the liability side of the banks' balance sheets) and falling levels of lending since April 2004 (on which more below). This has caused liquidity to build up on the banks' balance sheets. As explained in greater detail below, as long as the current exchange rate regime is being defended greater levels of money market liquidity is an inevitable consequence.
- Lack of alternative investment instruments. China's relatively small bond market (outstanding bonds were equivalent to around 20% of GDP in 2004, and repo trading

³² 'Guanyu 2002 nian remin yinhang gongkai shichang yewu qingkuang', Shui Ruqing and Sun Guofeng, *China Money*, April 2003, pp. 24-28.

³³ Xia Bin outlines a range of reasons for the inefficacy of interest rates including, increases in FX reserves, widespread liquidity, PBoC re-lending (half of which in 2002-03 was not to be repaid), the pressure to increase loans to bring down NPL levels, and the banks own profit model (which limits the PBoC's ability to narrow the margin between loan and deposit rates.

'Zhongguo huobi zhengce chuandao jizhi fenxi', Xia Bin, *China Money Market*, June 2004, p. 6-9.

predominates) means that banks large liabilities (deposits) greatly exceed the amount of assets available to buy.³⁴ This has profound macro-economic consequences, as Yu Yongding has argued. Given the limited nature of the bond market, money, defined as demand and time deposits, has no significant substitutes.³⁵ In such circumstances, the interest-elasticity of money demand approximates to zero (i.e. people do not switch between bonds and money as interest rates move), and the LM curve in the IS/LM model is vertical (on which more below).

- CAR targeting. Chinese banks are seeking to meet the 2007 8% capital adequacy requirement. This is likely causing them to limit lending to corporates and maximise lending into the inter-bank markets. Corporate lending carries a 100% capital requirement, while PBoC bills and other government securities do not require capital to be put aside.
- Although it is declining, there is a profit incentive.³⁶ The PBoC currently pays 0.99% on excess deposits, unlike in many other countries, including the US, where excess reserves do not receive any interest payments at all.³⁷ Several analysts, including Xia Bin and Zhao Cila, have called for excess reserves not to be paid interest at all.³⁸ This would be designed to encourage banks to lend more into the money markets and would thus make them more sensitive to money market rates. However, given the limited alternative investment options and low money market rates (as well as the likelihood of even lower rates if excess reserve rates were to be lowered to zero), such a move would undermine bank profitability. Banks would be faced with liabilities building up on their books while an important revenue-generating avenue would be lost, and thus banks are most likely resisting this move.
- Banking reforms skew incentives. Given current banking reforms (which emphasise the lowering of NPL ratios), banks may decide that putting money on deposit with the central

³⁴ In recent months, as banks and insurers have been forced to invest in bonds of longer tenors as demand for bonds has outstripped supply, meaning that China's nascent yield curve has flattened.

³⁵ See George Lamson, 'China's macro-policymaking in the 1980s-90s', Working Paper, March 2002, Research Centre for International Finance, Chinese Academy of Social Sciences, for a review in English of Yu Yongding's work.

³⁶ Xie Duo (2002), among others, notes that high rates paid on excess reserves partly explained the lack of overnight lending.

³⁷ According to Zhao Cila, the PBoC paid out an estimated CNY23bn (USD2.8bn) in interest on excess reserves to the banks in 2004, when the excess reserve interest rate was 1.62%. 'Shengxi yu lilunji zhi de shishi tiaozheng', Zhao Cila, *China Money Market*, November 2004, pp. 48-50.

³⁸ 'Shengxi yu lilunji zhi de shishi tiaozheng', Zhao Cila, *China Money Market*, November 2004, pp. 48-50.

bank for a guaranteed return is preferable to lending out to customers, given the administrative costs and credit risks that the latter option entails.

- Limits on loan growth (see below).

Different types of financial institution have different levels of excess reserves, as table 4 shows. Shareholding banks tend to have higher levels than state-owned commercial banks. This makes reducing the overall excess reserves ratio difficult because of the differentiated impact on different institutions. Analysts debate the reasons why. One theory is that state-owned commercial banks (which have relatively low levels of excess reserves) benefit from their large branch networks and large volumes of long-term deposits. This makes liquidity management easier. In contrast, smaller shareholding banks have smaller volumes of on-demand deposits, which means they need to keep large volumes of liquid funds on their balance sheets. An alternative hypothesis is differences in the efficiency of their payments systems or liquidity management, state-owned commercial banks being better at managing these than the smaller banks.

Table 4. Levels of excess reserves at different institutions, %

	2001	2002	2003	2004
State-owned commercial banks	6.37	4.83	3.63	3.54
Shareholding banks	15.77	10.31	8.63	7.47
Rural credit co-operatives			8.11	10.34
City commercial banks		5.92	5.98	

Sources: Xia Bin, PBoC Monetary Policy Reports

An additional difficulty for the PBoC is that, as chart 2 suggests, levels of excess reserves are seasonable. The spikes at the end of the year in 2003 and 2004 are due to banks preparing for Chinese New Year, when firms and households drain liquidity from the banking system in order to pay cash gifts to family, friends and colleagues. In 2003, this end-of-year effect was exacerbated by banks, already facing the higher 7% reserve requirement introduced in September, preparing for more reserve hikes and a rumoured PBoC discount lending rate rise. In response to these fears, banks built up additional liquidity on their balance sheets, reducing lending into the money markets, and causing money market rates to spike (which chart 12 below shows).

In addition to large excess reserves, a second offered reason for banks' insensitivity to the central bank rate is the large variety of money market members. Since it is not reserved to commercial banks, one PBoC official interviewed by the author claimed that this dilutes the effectiveness of OMO.³⁹ With securities companies and other NBFIs as members, CHIBOR rates 'no longer

³⁹ This problem is also discussed by Xie Duo (2002).

reflect only the supply and demand of reserves of deposits handling institutions', as Xie Duo notes.⁴⁰ The seriousness of this problem is unclear.

2. For the transmission of monetary policy to work, banks need to be able to absorb and pass changes in the cost of money market funds to their customers appropriately. They are currently not able to. This involves training credit officers, building data systems, developing the ability to put together portfolios of loans (which would allow banks to disperse risks). China's banks are only beginning to learn how to price risk. In a survey in 2003/04 the PBoC found serious deficiencies in banks' ability to price loans and manage risk. It found that banks did not have databases on the risk profiles of their customers or of the industries these customers operate in and have few analytical tools for assessing credit risk. Many of China's banks have employed overseas consultants to help them design and roll out such systems, but these improvements take time to be understood, absorbed, and extended over the country.

3. In order for the interest rate to affect the economy, corporations and individuals need to be sensitive to the price of capital; at present there are limits to this sensitivity. This is another important reason for the vertical LM curve. During the 1990s, Chinese state enterprises, the ones with a monopoly on bank loans, were not sensitive since they did not have to repay their loans. Moreover, no consumers had access to bank loans - so their spending behaviour was not sensitive to the price of loans either. Instead, the government relied on the volume of lending to influence economic growth.⁴¹ The 'credit channel' was therefore the main means of influencing aggregate demand. More loans meant more investment finance available, and thus more growth. Broader financial and enterprise reforms over the last decade should, however, have meant that the interest rate has more influence. Over the last five years, more private companies have borrowed from banks, state firms are having to pay back loans, and some 11.4% of outstanding loans in 2004 were to consumers.⁴² In other words, economic entities should be more sensitive to the price of money and monetary policy should therefore be becoming more effective, at least from a structural point of view.

⁴⁰ Xie Duo (2002)

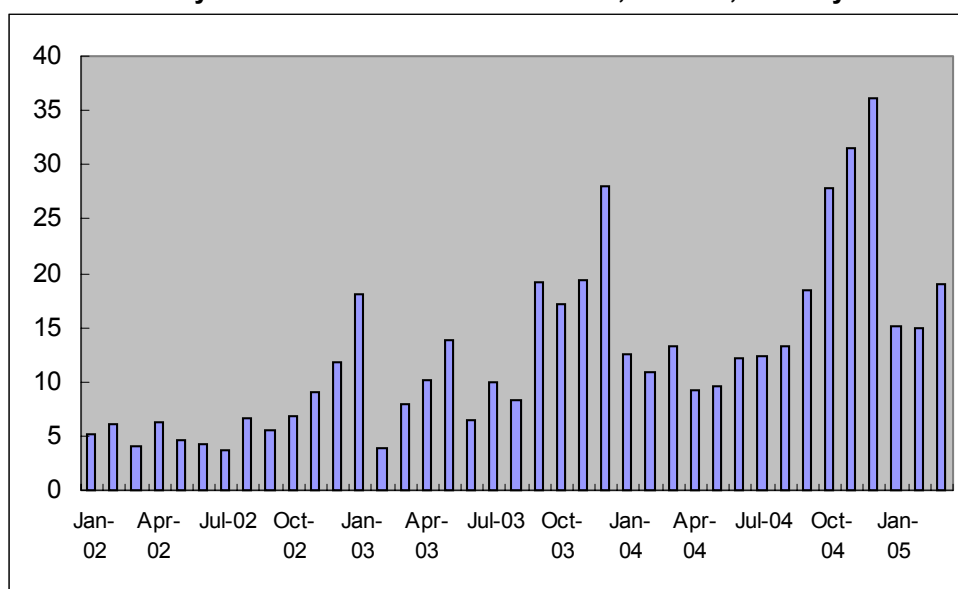
⁴¹ See Lamson, 'China's macro-policymaking in the 1980s-90s', Working Paper, March 2002, Research Centre for International Finance, Chinese Academy of Social Sciences.

⁴² Sun and Zhang argue for the expansion of consumer financing (through, for example, making applications easier and extending terms) in order to increase the efficiency of monetary policy. First, it improves the efficiency of the interest rate channel as a monetary policy transmission mechanism since rate changes will affect consumption (as well as investment). This is the normal liquidity effect – an unanticipated increase in money supply stimulates demand growth. Second, over and above the liquidity effect, consumer finance also amplifies the credit channel. See 'The expanding consumer credit sector and the efficiency of monetary transmission mechanism', August 2004, Sun Guofeng and Zhang Yanchun, Working Paper.

3. FX reserves and monetary policy: independence compromised?

The defense of the Renminbi/USD peg has undermined the independence of monetary policy in China. According to standard macro-economic theory, a fixed exchange means that any attempt to use monetary tools to stimulate or cool aggregate demand is neutered by current account adjustment and capital outflows or inflows. At the same time, the exchange rate and monetary policy of the country to which one is pegged will affect one's own economy: their monetary stimulus will be yours too. With the peg, China's monetary policy has therefore had to cope with the Fed's monetary policy, which has been heavily stimulative during 2000-04. Gaining independence for Chinese monetary policy is one of the calls of those supporting currency policy reform. However, while China's capital account is porous, it is not open, and the PBoC is capable of sterilising inflows (or using FX reserves to counter devaluation pressures), meaning that in practice China can enjoy some insulation from Fed policy.⁴³ However, this independence comes at a price. Chart 3 shows the increase in FX reserves over the last two-year period to total USD609.9bn at year-end 2004, and USD659bn by the end of the first quarter of 2005. As the chart makes clear, the rise in the build-up has been accelerating in recent months, partly driven by the depreciation of the CNY's real effective exchange rate.⁴⁴

Chart 3: Monthly increase in China's FX reserves, USD bn, January 2002 – March 2004



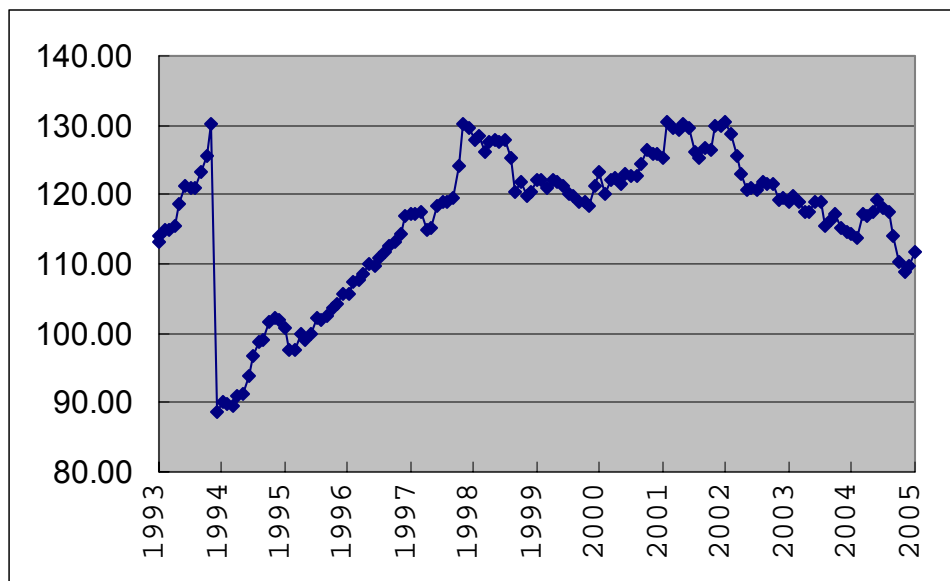
Sources: SCB Global Research, CEIC

⁴³ A point made by George Lamson, 'China's macro-policymaking in the 1980s-90s', Working Paper, March 2002, Research Centre for International Finance, Chinese Academy of Social Sciences.

⁴⁴ See 'A primer on China's extraordinary FX reserve growth', SCB Global Research, January 21st 2005

Chart 4 shows Standard Chartered Bank's in-house CNY REER model. It fell 14.1% between February 2002 to February 2005, largely thanks to the depreciation of the USD over the period, in particular Q4 2004.

Chart 4: The CNY's real effective exchange rate



Source: SCB Global Research

Note: July 1995=100

In recent years, money supply in China has increasingly come from FX inflows, rather than the PBoC injecting base money mainly through its lending to financial institutions, the practice which was common before the mid-1990s⁴⁵ Xie Ping shows that during 1988-2002 there was a significantly strong correlation between FX inflows and M0 growth, as table 5 shows.⁴⁶ This correlation strengthened when we extended the period a further two years to cover 1988-2004, suggesting that during the 2002-04 period this relationship was extremely strong.

Table 5: The correlation between FX inflows and M0, 1988-2002 and 1998-2004

	1998-2002 (Xie Ping)			1998-2004 (SCB)		
	M0	OMO	FX	M0	OMO	FX
M0	1			1		
OMO	-0.68	1		-0.89	1	
FX	0.89	-0.65	1	0.93	-0.96	1

Sources: Xie Ping, SCB Global Research

⁴⁵ See PBoC 2003 Monetary Policy Report, p.7

⁴⁶ See Xie Ping, 'China's Monetary Policy, 1998-2002', Stanford University Working Paper, February 2004, #217.

Note: OMOs of course exhibit a strong negative correlation with M0 growth since these involve sterilizing FX inflows and preventing them increasing M0.

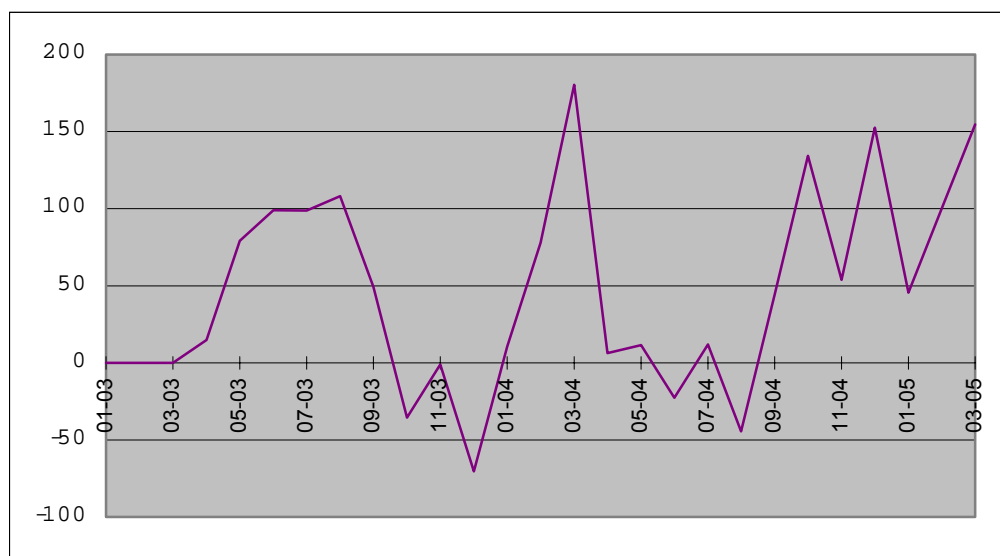
Given the fact that money supply growth is therefore largely exogenous, the PBoC faces considerably challenges controlling it. China's financial authorities have used three tools to control money supply in recent years, and thus the inflationary impact of these large FX inflows. First, OMO using both PBoC bills and repos.⁴⁷ Bill issuance since 2003 has not solely been aimed at removing FX reserve-produced liquidity – there have been two periods when OMOs have taken on a short-term expansionary stance: Q4 2003⁴⁸ and Q2-Q3 2004 being the main examples.⁴⁹ However, overall OMOs have been used to reduce liquidity. Chart 5 shows net bill issuance since it began in April 2003. Net bill issuance accelerated in late 2004 to cope with FX inflows of USD20-30bn a month. Net issuance remains at high levels, although it is likely to dip slightly in Q2-3 because of lower levels of bill redemptions.

⁴⁷ The PBoC apparently foresaw the need to sterilize inflows and acted to prepare itself in 2002. In April 2002, it began selling securities on its own book. In June 2002, it began repo dealing, selling securities to commercial banks with a repurchase agreement. However, it soon ran out of government bonds to sell, so it needed a new instrument. In late 2002 it converted its outstanding repo contracts into central bank bills, and a new instrument was created.

⁴⁸ Net PBoC bill sales in Q2 and Q3 2003 effectively sterilized 70% of the CNY produced by FX inflows during this period. In Q4 2003, the PBoC reversed gear, however, not selling enough new bills to replace the bills that were maturing. As a result, its Q4 2003 net bill issuance was negative CNY137bn. This policy reversal allowed CNY297bn worth of new foreign exchange to enter the economy. The PBoC may have stopped sterilisation activities in Q4 2003 because of rising interest rates. The 7-day CHIBOR, China's inter-bank rate, rose from 2.1% on August 22nd to 2.7% on August 29th, peaking on January 23rd 2004 at 3.1%. Higher money market rates were the result of banks withdrawing money in order to meet a higher reserve requirement introduced in September 2003. Another possible reason for the mid-2003 stalling of bill issuance was concerns over the impact of the collapse of Delong, a large private conglomerate. The PBoC's fear may have been that a number of commercial banks were vulnerable to the group's collapse. Keeping the system liquid therefore was important for financial stability. 'Reining in growth in China: A note for the Euro 50 Group 2004 Roundtable', Ma Guonan and Robert McCauley, Bank for International Settlements, June 2004.

⁴⁹ In Q1 2004, the PBoC resumed its bill issuance programme, but then relaxed its activities again during Q2-3 2004, issuing only net CNY17.8bn. In contrast to Q4 2003 – Q1 2004, interest rates remained low. Instead, the PBoC appears to have decided that the macro-economic adjustment programme being rolled out at this time had the potential to disrupt normal money market operations. It therefore seems to have decided to allow liquidity to build up at this point. Fiscal deposits by the MoF also rose in this period, adding to the reserves.

Chart 5: Net PBoC bill issuance, April 2003 – March 2005, CNY bn



Source: SCB Research

During 2004, we estimate that the PBoC withdrew a total of CNY616bn (USD74.5bn) from the monetary base through bill issuance. This was the equivalent of 36.1% of FX inflows. Repo transactions had a net effect of around zero through the year, although they were used in June-August to sterilise up to CNY101bn. In addition, we believe that the PBoC secretly issued CNY196.6bn (USD23.8bn) in PBoC bills sometime in May-June to the four state banks. These bills are not available for trading on the inter-bank bond market and there is no publicly available information as to their term or discount rates. In total then, from our analysis of issuance volumes we estimate that the PBoC sterilised CNY812.6bn (USD98.3bn) during the year, equivalent to 47.5% of FX inflows during 2004. This number approximates to the change in the bond liabilities announced on the PBoC's balance sheet for 2004 of CNY804.7bn (USD97.3bn). These numbers are illustrated in table 6.⁵⁰

⁵⁰ See 'Sterilisation update: Banks' reserve requirement will likely have to rise again', SCB Global Research, May 12th 2005

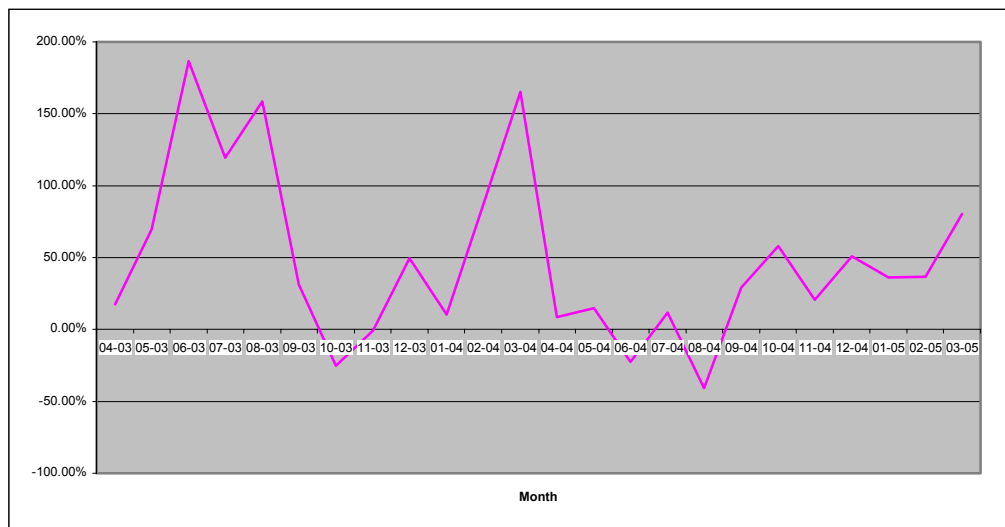
Table 6: Net sterilisation effect from year end 2003 to year end 2004, CNY bn

	<i>Net sterilisation effect</i>	<i>Notes</i>
Openly issued PBoC bills	616.0	After net issuance of CNY342.4bn in the previous year
'Secret' bills	196.6	PBoC bill #46-50 inclusive, probably placed with four state banks.
Repos	0	Net effect for year was approximately zero. Repo sterilisation peaked in the middle of the year, when around CNY100bn was being regularly sterilised by repos. However, by the end of the year, the volume of repo issuance had fallen to around CNY10bn
Total	812.6	Approximates to the CNY804.7bn increase in bond liabilities on the PBoC's balance sheet.

Source: SCB Global Research

Somewhat bizarrely, the PBoC made net bill issues of CNY342bn (USD41.4bn) in 2003, which were also equivalent to 47.5% of FX inflows in 2003. However, there has been a market increase in consistency from 2003: the proportion of FX inflows sterilised in 2003 varied much more than in 2004. The PBoC appears to have developed better mechanisms to anticipate FX inflows and a more appropriate issuance schedule. Chart 6 shows bill-based sterilisation through the last two years.⁵¹

Chart 6: Monthly sterilisation by PBoC bills, % of FX inflows, January 2003 - March 2005



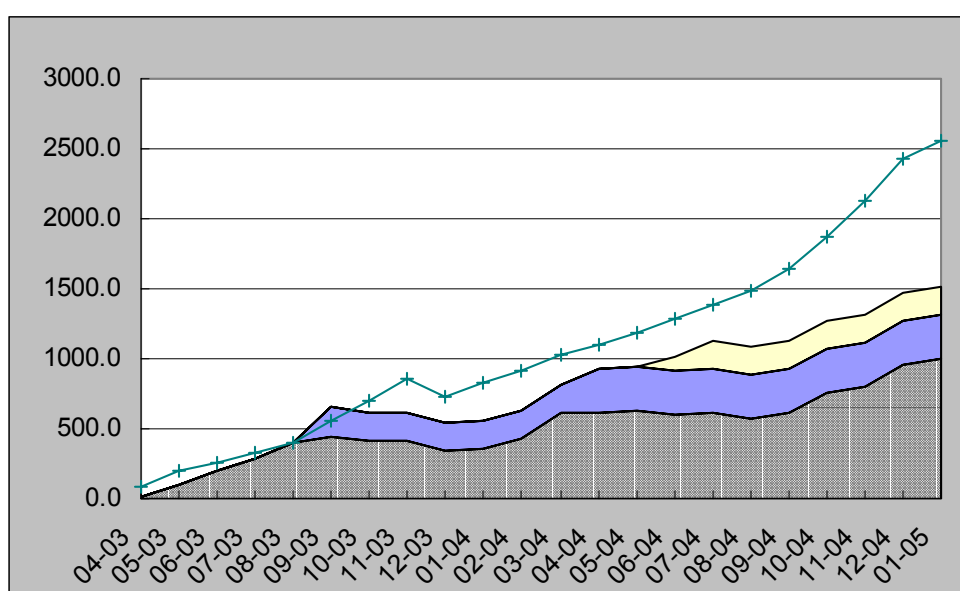
Sources: SCB Global Research, Bloomberg, CEIC

⁵¹ See 'Sterilisation update: Banks' reserve requirement will likely have to rise again', SCB Global Research, May 12th 2005.

The second tactic to control FX reserve inflows has been higher reserve requirements. On September 21st 2003, the required reserve ratio was raised from 6% to 7%, and to 7.5% on April 25th 2004. Based on the total value of deposits at all financial institutions at these dates, these moves had the effect of withdrawing CNY203bn and CNY111.2bn from the system and also thereby lowered the money multiplier.⁵²

Chart 7 shows cumulative inflows of FX funds since April 2003, as well as the cumulative effects of open PBoC bill issuance, 'secret' bill issuance, and reserve requirements. Since August 2004, a growing proportion of the FX inflows entering the economy have made it through to base money.

Chart 7: Cumulative inflows of FX funds and cumulative bill sterilisation, CNY bn



Sources: SCB Global Research, CEIC, Bloomberg

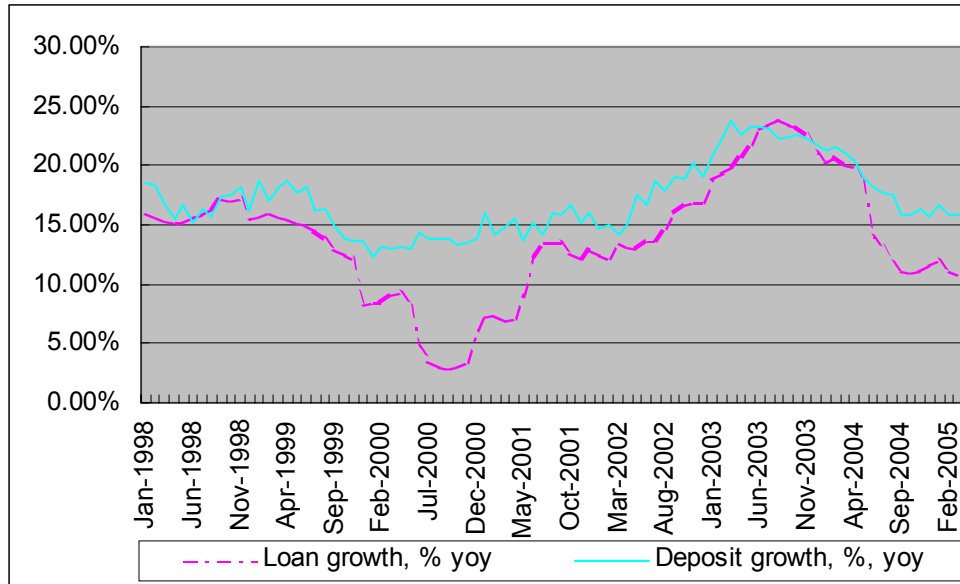
Note: The green crossed line indicates additions to base money from FX inflows. The first, lower shaded band indicates base money that has been sterilized through open PBoC bill issuance. The second banded area is the additional sterilisation-effect achieved through two reserve requirement increases. The third banded area indicates the additional sterilisation achieved through secret bill issuance. The gap between the crossed line and the uppermost shaded band is new base money.

Moral suasion is the PBoC's third tool. Officially, this involves guidance on the sectors that banks should lend to – less to cement and real estate, more to agriculture, small and medium-

⁵² The money multiplier defines how much new M2 is produced for every new unit of base money. [Broad money (M2) = Base money (M0) X Money multiplier]. A rise in the required reserve ratio lowers the money multiplier.

sized enterprises, for example.⁵³ However, in practice, it is suspected that window guidance also involves lending volume guidelines.⁵⁴ Given the gap which has opened up between sterilisation and base money growth (see chart 7), controlling credit growth by administrative means may be the most important means by which money supply is currently being constrained.⁵⁵ Chart 8 shows year-on-year deposit and loan growth. Note the marked decline in lending growth after Q1 2005, while deposit growth has remained at a high level.

Chart 8: Lending and deposit growth, yoy, %



Sources: SCB Global Research, CEIC

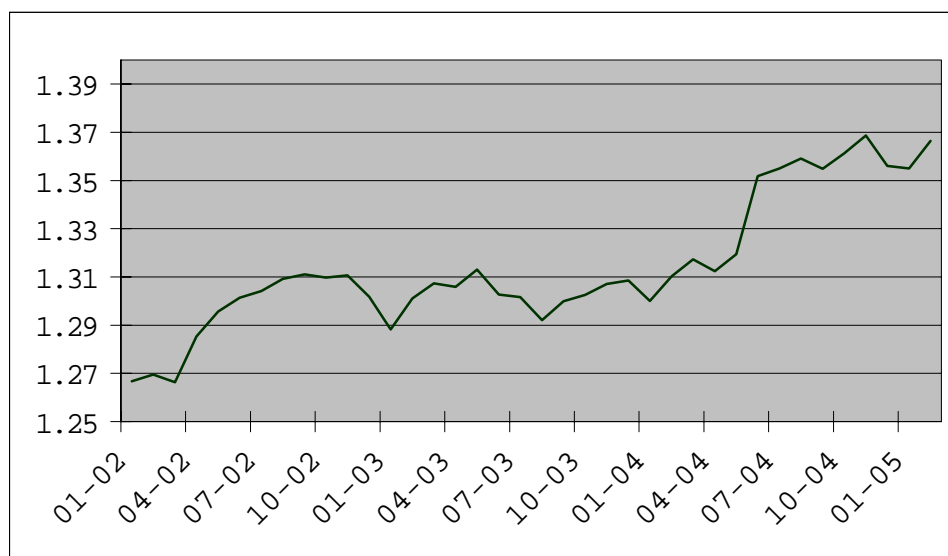
Chart 9 shows the ratio of total deposits to total loans across all financial institutions. During Q1 2002 to Q1 2004 it was relatively stable, but it started to increase in May, indicating that the banks' deposits were rising faster than their loans. It has remained at a higher level. One alternative hypothesis to explain this shift in lending behaviour is the CBRC's introduction of much tougher capital adequacy ratio (CAR) regime, calling for banks to meet 8% risk-weighted capital adequacy levels by 2007. The theory, as noted above, has encouraged banks to pull back on loans and maximize investments in assets (money market bills and bonds) that carry no capital requirement.

⁵³ Interview, PBoC Shanghai, March 2005.

⁵⁴ A number of conference participants agreed with this claim.

⁵⁵ The banks' efforts to meet new international capital adequacy standards may be encouraging them to limit lending to match their limited capital.

Chart 9: Financial institutions total deposits to total loans ratio



Sources: SCB Global Research, PBoC, BIS

The consequences of China's current exchange rate and monetary policy framework

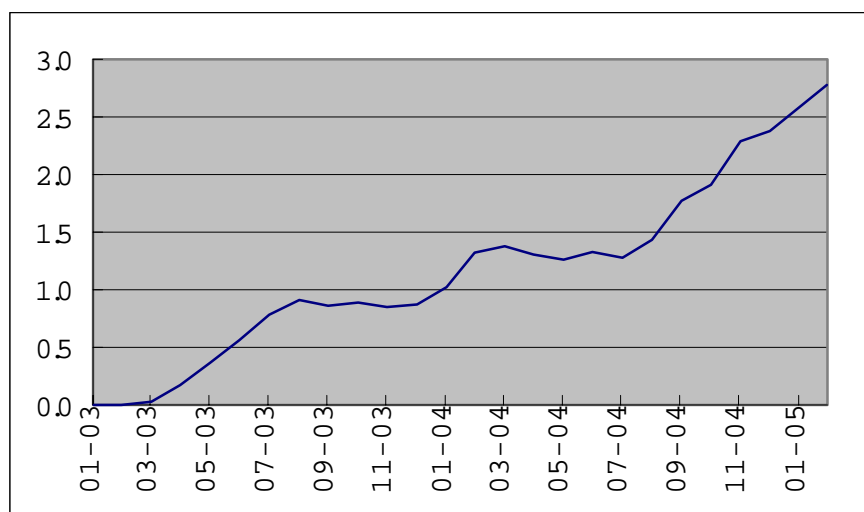
This three-pronged approach – open market operations, moral suasion and higher reserve requirements – is how China has managed to control inflation while FX inflows have boomed. While inflation has remained low, this set of policies has other consequences. The first consequence of defending an under-valued currency is usually the cost to the central bank's bottom line. We calculate that the PBoC spent CNY17.2bn (USD2.1bn) in 2004 on its publicly traded bills.⁵⁶ We exclude the cost of the secretly issued bills, since we do not know their discount rate or term. If we assume that they were one-year bonds issued at a similar rate to those issued publicly at the same time, then this figure would rise to CNY22bn (USD2.7bn). In addition, we estimate that short-term repos cost the PBoC CNY4.3bn (USD518m) in 2004.⁵⁷ The PBoC has also engaged in a small amount of bond trading, which we ignore in these calculations since we believe it is not of significant scale. In total, the PBoC spent CNY21.5bn (USD2.6bn) on interest payments on openly issued bills and repos, some 0.8% of the government's revenues last year.

⁵⁶ The PBoC's bills are issued on a discount basis. So, when the PBoC's issues a CNY10bn, three-month bill at 2.16%, for instance, it does not withdraw CNY10bn from the banking system. Instead, it withdraws CNY9.946bn. After three months, it pays back CNY10bn to the holders of the bills. We spread the cost of this bill (the difference between issue and redemption amounts) over its term. So, if this three-month bill were issued in November 2004, its cost (CNY0.054bn) would be split into three parts, over December, January and February. Repo-costs were calculated the same way.

⁵⁷ Last year the PBoC did 43 repo deals in which it borrowed money from the banks, using its own bonds as collateral. This also has the effect of taking money out of the system. However, because of the short-term nature of these transactions (seven and 28-day repos are common), the PBoC was in effect consistently sterilising the same block of money.

Add in the secret bills and this total rises to CNY26.3 (USD3.2bn). The costs are rising. We estimate that March 2005 cost the PBoC CNY2.8bn (USD339m), compared to CNY1.3bn (USD157m) in March 2004 (based on open issuance). This is illustrated in chart 10. If this rate of increase is sustained, we estimate that the cost to the PBoC will be CNY41.4bn (USD5.0) in 2005, more than double the 2004 cost.

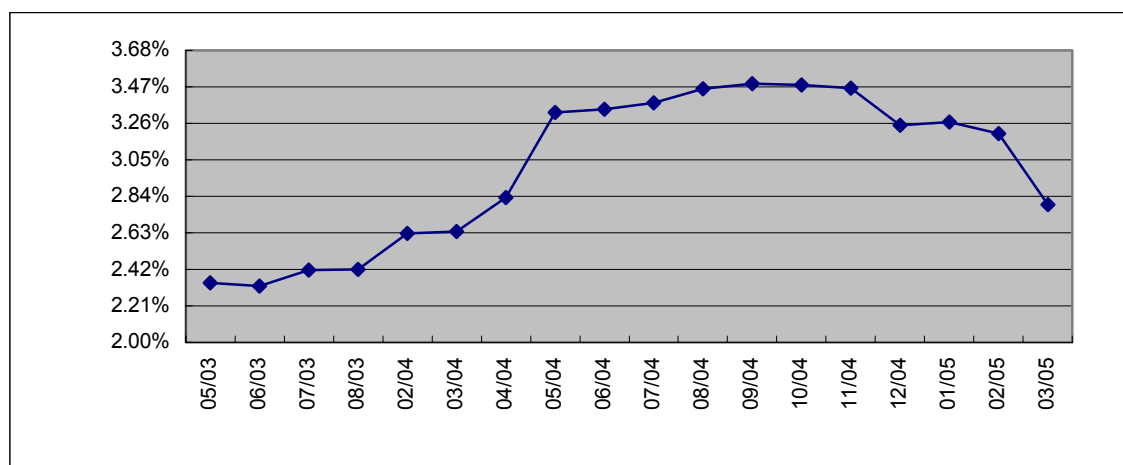
Chart 10: The monthly cost of PBoC bill issuance (excluding 'secret' bills), USD bn



Source: SCB Global Research, Bloomberg

The rising costs are because of the ever-larger volumes of outstanding bills involved, however, rather than rising interest rates being paid on central bank bills. One would expect higher rates of inflation and thus higher interest rates in a textbook case of an undervalued currency. However, as chart 11 shows, the rates paid by the PBoC at auction on new issues of one-year PBoC bills have fallen in recent months as liquidity has built up in the money markets, and banks and NBFIs have competed for a limited range of financial instruments.

Chart 11: Auction rates on one-year PBoC bills, May 2003 – March 2005



Sources: SCB Global Research, Bloomberg

The costs to the PBoC of domestic bill issuance need to be netted off against revenues from investments made with FX reserves. SCB research suggests that the PBoC received significant returns on its FX investments in 2004. Table 7 presents income – not including capital gains from valuation effects – from two theoretical China FX reserve portfolios. These two portfolios generated income of USD11bn and USD18bn respectively in 2004.⁵⁸

Table 7: Net income on USD and EUR investments, USD bn

	2003	2004
USD Portfolio #1	11.5	13.9
USD Portfolio #2	4.9	6.9
EUR	2.9	4.1
Total (range)	7.8-14.4	11.0-18.0

Source: SCB Global Research

These results rest on a number of assumptions. First, we divided China's FX reserve portfolio between USD and EUR assets only (excluding assets in other currencies such as yen).⁵⁹ We then assumed that at the beginning of 2004 the composition of China's FX reserves was around 82%/18% USD/EUR, and that new FX inflows were invested in such a way so that by the end of the year that composition was adjusted proportionally to around 76%/24% USD/EUR. During 2004, we thus assume that only 64% of new FX reserves were invested in USD assets.⁶⁰ We

⁵⁸ 'China may be profiting from defending the CNY peg', SCB Global Research, March 19th 2005.

⁵⁹ Of course, at the margin the SAFE is probably investing some of its holdings in JPY and other currencies. Given Japan's low interest rate environment, any JPY assets would have paid lower returns than USD and EUR so it is possible that this assumption inflates the returns we found.

⁶⁰ This reflects the view that China's new FX reserves were being diversified away from USD assets relative to pre-2004 investments during last year.

then set up a portfolio of securities. While the US Treasury's TIC data provides clues to trends across time, we do not believe it can form the basis for constructing a reserve portfolio.⁶¹ So we constructed two portfolios based on instruments commonly available in the two capital markets. USD Portfolio #1 is made up of US Treasuries of 2-, 3-, 5- and 10-years term, the capital divided equally between them. USD Portfolio #2 is made up of 40% US bills and 60% US notes, from 2-days to 10-years term, all issued in 2004.⁶² For both portfolios, we worked out a weighted average rate of return for assets.⁶³ For the EUR side of the portfolio, we repeated all of the above, creating a portfolio of 2- to 10-year assets and a weighted yield. We assume that all the revenues were re-invested in the portfolio and we ignore currency evaluation effects. Based on these assumptions, 2004 saw the PBoC receiving net income of at least a net USD8.4bn (USD11bn in total returns from USD Portfolio #2 and EUR, minus the USD2.6bn in bill issuance cost) and possibly as much as USD15.4bn (USD18bn generated by USD Portfolio #1, minus USD2.6bn). Actual net income is likely to be at the higher end of the range as the PBoC/SAFE has limited incentives to invest in short term bills and notes, since their rates are not as good as longer-term bonds and longer-term bonds are just as liquid.

How is it that the PBoC likely making money on the peg, when many countries in a similar position lose money? There are underlying two reasons: low domestic interest rates and a large stock of FX assets. China is currently enjoying abnormal rate conditions. Other countries in a similar position usually have to pay higher rates. Take South Korea, for instance, where so-called FX stabilisation one-year bonds were sold for 3.85% in March 2005. The equivalent PBoC bill was priced at 2.82%. Compare these to a 3.83% rate for the equivalent US instrument, and it is clear that – at least in balance sheet terms – China's central bank is under much less pressure than one might have expected. However, the profitability of these operations is also determined by the large difference in scale between securities invested overseas and securities issued domestically. The PBoC started 2004 with USD405bn to invest overseas and outstanding bills on which interest had to be paid out of only USD47bn. However, this is not only a scale thing: the spread between rates in the US and in China's money markets looks set to continue to widen as the Federal Reserve continues to tighten and CHIBOR rates look set to continue to fall as long as

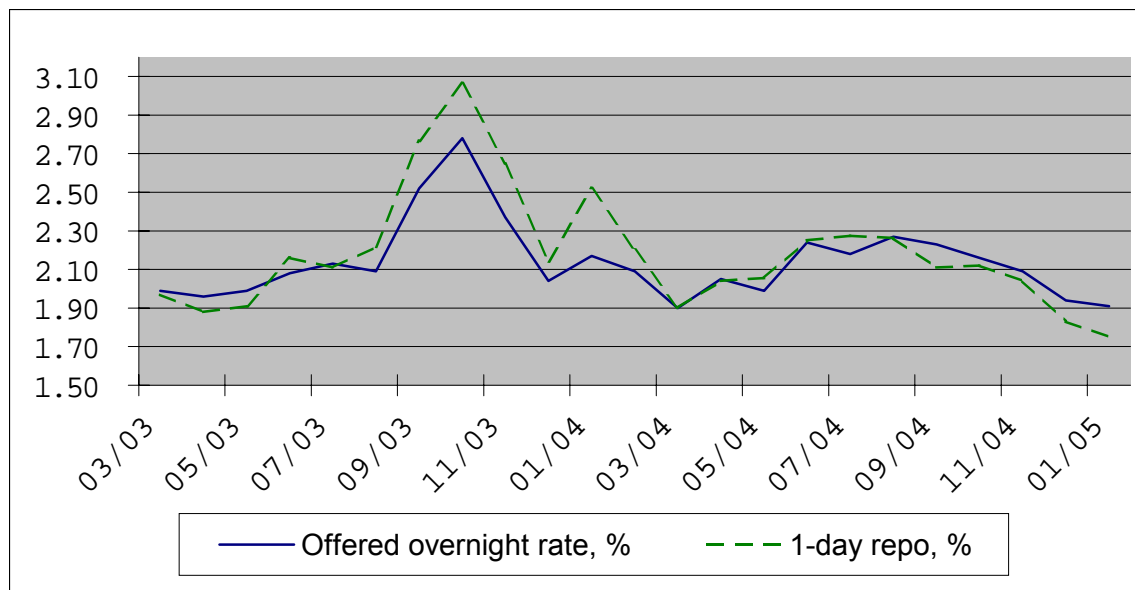
⁶¹ The US Treasury releases data on foreign capital inflows into the US capital markets. This data breaks down the inflows into instruments sold and purchased. However, the TIC data is not comprehensive and in fact potentially misleading. For instance, it does not reveal which countries/central banks are buying/selling assets, but rather *where orders for USD assets are filed*. China, like other countries, could well be using Hong Kong, Singapore or other offshore centres to trade in the US markets in order to disguise its behaviour.

⁶² We have excluded agency securities from the two portfolios, which may mean our results understate returns made since agencies pay slightly higher rates.

⁶³ For 2003 and 2004, we calculated these rates of return on a monthly basis. New FX reserves invested began to generate the rates of return in the second month. For those assets invested before 2003, we took an average rate of return on the portfolios during 2001-02 to calculate returns that could be generated by these assets.

FX inflows continue to flow into China at speed. Chart 12 shows both the overnight CHIBOR and one-day repo rates.

Chart 12: CHIBOR overnight and one-day repo rates, %



Source: CEIC

Note: The Repo rate is usually lower than the CHIBOR overnight rate since it is a collateral-based contract. Foreign banks, because they lack capital and bonds, tend to trend more in the CHIBOR market. Most Chinese banks in contrast concentrate their trading in the Repo market. For this reason, analysts tend to prefer to use the Repo rate as the market benchmark and the CHIBOR rate tends to be more volatile. At times of illiquidity in the markets, the Repo rate tends to rise above the equivalent CHIBOR rate.

Given lending constraints, and the factors explained above, China's money markets are flooded with liquidity. How low can money market rates go? In recent weeks, they have headed lower and lower as a result of FX inflows. There is a limit to how low they can go, however: the central bank's excess reserve interest rate, currently 0.99%. However, this may have to fall again to prevent the money markets from seizing up, as has nearly happened in the recent and more distant past.⁶⁴ In February-March 2005, money market rates were approaching 1.62%, the excess

⁶⁴ Consider what happened in 2001 when money market rates were also falling. By the end 2001, the seven-day repo contract had a yield of 2.13%, only 6 bps above the rate then paid on all reserves, 2.07%. This barely covered the banks' costs, so many stopped lending and simply deposited the excess cash with the central bank. When, on February 20th 2002, the PBoC's reserve rate was cut to 1.89%, the seven-day repo rate also fell, to 1.95%. In response, the PBoC began open market operations, which had raised the seven-day repo rate to 2.18% by mid-September. This re-created the incentive to lend funds into the money market. 'Guanyu 2002 nian

reserve deposit rate. This time, instead of using OMOs (as used in 2001-02 in similar circumstances), the PBoC lowered the excess reserve rate to 0.99%, allowing the money markets rate to drop further without the money market freezing.⁶⁵ What effects will sustained low money market rates have?

- Bank profitability will be adversely affected. They are overall net lenders in the money markets. Since they rely for some 80% of their profits on the spread between deposits and loans, restricting loan growth impacts directly on their bottom line. At the same time, with money market rates falling they are also under pressure here.
- Banks will be unable to price up lending rates, despite the fact that they are free to do so. Cheap – but restricted – credit will be the theme of 2005.
- Securities companies, net borrowers in the money markets, can now access very cheap money. At a time of tighter regulation, sagging stock prices, and widespread insolvency, this is helpful.
- The quality of lending is likely to deteriorate. One might argue that a small number of loans and slower loan growth would lead the banks to choose better credit risk. An alternative view starts with the assumptions of asymmetric information and that a limited amount of cheap finance is now available from the banks. Few borrowers will be put off from applying for loans given its cheapness. Borrowers will also be incentivised to do their best to obtain it, using legal and illegal methods. Given the mass of applications, it will be harder for banks to tell good applicants from bad ones. This will have a negative effect on the quality of the banks' loan portfolios.
- The informal financial market is likely to be growing as firms seek access to credit.

How long can this arrangement survive? At present, it looks remarkably sustainable. Inflation as measured by consumer prices has been falling, hitting a low of 1.8% year-on-year in April, although producer prices are still increasing by 5-6% year-on-year. PBoC bill issuance continues to build, putting pressure on the expense account of the PBoC, but these costs are more than adequately covered by the differential made on USD investments, and the spread is widening. Bank lending growth has fallen to more moderate levels, thanks to bank managements trying to maximise their capital as well as provide administrative guidance. The pains have been dispersed through the system, be it reduced bank profitability or squeezed margins at the firms that have not been able to pass on increased costs.

remin yinhang gongkai shichang yewu qingkuang', Shui Ruqing and Sun Guofeng, *China Money*, April 2003, pp. 24-28.

⁶⁵ This move apparently confused some observers since it involved more liquidity entering the money market, driving rates down, and was thus supposedly a contradiction of the PBoC's efforts to tighten liquidity.

There are sustainability issues though. First, consider FX inflows. With the USD having consolidated at still low levels, and slowing domestic investment growth in China, China's trade surplus will grow during 2005. A back of the envelope calculation suggests that, based on the Q1 2005 trade surplus of USD16.6bn that the year's surplus could be in the USD80-90-100bn, 4-5% of 2005 projected GDP. Without exchange rate reform, net FX inflows will likely exceed USD250bn in 2005. Current efforts to expand capital outflow channels, such as allowing more outward FDI (a quota of USD5bn for 2005, compared to USD3.3bn in 2004) look unlikely to quell this pressure. The key sustainability issue is not the financial cost of bill issuance – it is rather at the level of interest rates. Chart 13 shows the excess reserve ratio and the most recent overnight repo rate. It is clear that either the excess reserve ratio will have to be reduced or the bank reserve requirement will have to be raised – otherwise money market rates will dip below the excess reserve rate and the money market will stop functioning. Both measures will further impair the banks' ability to lend profitably. In other words, it is the banking sector that is paying the monetary consequences of the peg.

Concluding remarks

For monetary policy to work, a number of obvious things need to happen. The bond markets need continued expansion to allow banks, corporate and individuals access to an alternative to money. The formalization of informal liabilities (new NPLs on banks' balance sheets, for instance, or pensions liabilities) in the system would help this process. Consumer credit should be expanded, conservatively, and loans to firms need to be repaid, in order for economic actors to be sensitive to the rates of capital. Banks need to be able to assess credit risk and appropriately pass on changes in money market rates to customers. All these actions will have the effect of flattening the LM curve and improving the monetary policy transmission mechanism. Excess reserve ratios have to be structurally reduced in order to allow OMO and the PBoC's own lending rate to become more important to the banks. More flexibility has to be introduced into the exchange rate, so that this tool takes up some of the adjustment required as China's role in global trade and capital movements expands.

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