2-9-2011

The China Monetary Policy Handbook

Tao Wang

Harrison Hu

UBS Investment Research

Asian Economic Perspectives

The China Monetary Policy Handbook (Second Edition)

9 February 2011

www.ubssecurities.com

Tao Wang
Economist
S1460208080042
wang.tao@ubssecurities.com
+8610-5832 8922

Harrison Hu
Associate Economist
S1460210090001
harrison.hu@ubssecurities.com
+8610-5832 8847

I. Overview and summary

II. The background

III. Monetary policy objectives and tool kit

IV. Interest rates

V. Foreign exchange inflows, capital controls, exchange rate and sterilization

VI. Liquidity, money supply, and asset prices

VII. The outlook and risks

I. Overview and summary

Four years after former UBS chief Asia and China economist Jonathan Anderson published "The China Monetary Policy Handbook", monetary policy remains one of the most interesting and misunderstood aspects of the Chinese economy. At this juncture, the role and direction of China's monetary policy is again the subject of confusion and fierce debate, compelling us to write an updated edition.

How does monetary policy work in China?

In a country with a heavily managed exchange rate and reliance on administrative controls and directives in key parts of the economy, how does monetary policy work? Who controls monetary policy and which variables do they target? What tools does the People's Bank of China (PBC) use and for what objectives? Does it have effective control of interest rates and liquidity? How does the PBC influence growth and inflation?

Our key findings are as follows:

This report takes a detailed look at the above questions, summarizing in part much of the work we've done on monetary and financial markets over the past few years. The key findings are as follows:

There is confusion about the role and targets of monetary policy

The confusion about China's monetary policy often stems from confusion about the key policy targets and instruments, and the role of the PBC. The PBC carries out monetary policy, but the ultimate policy decision is made by the State Council, China's cabinet. Monetary policy is given a broad set of policy objectives including growth, price and financial stability, and structural adjustment. At the same time, the government also uses other tools, including administrative measures, to control inflation – the conventional key objective of central banks and monetary policies in other countries.

The PBC manages the quantity of base money to help achieve its target on broad monetary aggregates

China still mainly relies on quantitative instruments to carry out monetary policy objectives, rather than pricing tools such as interest rates. The PBC targets broad money aggregates by adjusting base money supply as the intermediate instrument and by using credit quotas. With the distortions introduced by state ownership of firms and banks, there may be valid reasons in favor of quantitative management over interest rate tools in China. However, direct administrative controls on commercial bank credit can be evaded and are clearly distortionary, even though the system has evolved from detailed line-item credit planning 20 years ago.

Since 2007, the PBC has actively used required reserve ratios to manage base money liquidity, and this practice can last for a while

Since 2007, the PBC has actively used commercial banks' required reserve ratios (RRRs) to sterilize FX inflows and manage base money liquidity, along with open market operations. As FX reserve accumulation continues, we expect the PBC to continue to hike RRRs along with central bank bill issuance, and there is no "ceiling" on the ratio in the near future. Eventually, the cost of ever rising RRR to the banking system will start to matter, leading the PBC to either use alternative sterilization instruments or gradually exit from such operations.

The PBC still sets benchmark lending and deposit rates of commercial banks

China has liberalized rates in the money and bond markets, but still maintains a floor on bank lending rates and has effectively fixed deposit rates. Since the PBC uses quantitative monetary targets, it does not change the benchmark interest rates much. When the rates are adjusted, their impact is often

misunderstood. Since interest rates are held low, adjusting the rates at the margin has little impact on credit and economic growth.

Deposit rates are held artificially low, but the high saving rate is the key reason behind the low rate structure

The artificial depression of deposit rates does have an impact on the economy, but the high saving rate in China is the key reason why the overall interest rate level is low. In the current environment, rapid interest rate liberalization may not achieve the desired objectives, unless structured reforms can reduce distortions and lower saving rate.

One of the most debated and confusing issues in China is the combination of a quasi-pegged exchange rate, the large FX reserves increases, and domestic sterilization to mop up the resulting liquidity.

Capital controls and sterilization have helped China to maintain monetary policy independence

Despite the persistent large trade surpluses and FX reserve accumulation, domestic monetary policy has so far not lost independence. The main reasons are capital controls, and sterilization. We find that on average, the bulk of FX reserve accumulation has come from current account surpluses and foreign direct investment, not from "hot money" inflows, in part because of extensive capital controls. The PBC sterilized 70% of the FX inflows before the crisis and the credit cycle was broadly under control. Following a period of extreme monetary expansion in 2009, the central bank resumed sterilization operations again in 2010, including by raising reserve requirements 6 times.

The situation can not last forever

The situation can't last forever, though. Going forward, as the advanced economies keep monetary policy accommodative and as expectations of RMB appreciation remain strong, other financial capital inflows may increase substantially. As large surpluses persists and as global monetary policy remains loose, the authorities would be well advised to increase capital control and let the currency adjust more significantly over the next few years.

Control RMB lending is increasingly insufficient to manage overall liquidity in the system. The large stock of bank deposits raises the chance of asset bubbles

While bank lending remains the dominant source of firm's external financing, overall liquidity in the economy is much more than bank credit. The government will have to monitor a broader concept of liquidity and credit, as controls of RMB lending is increasingly insufficient. For asset markets, there is a need to distinguish the liquidity that the PBC can directly control, and the large stock of deposits sitting at banks that could potentially flow to asset market. The PBC can't do much to prevent asset price bubbles, although raising rates and tightening liquidity should help at the margin.

We expect more interest rate liberalization and less administrative controls eventually. However, structural reforms in other fronts are crucial

Going forward, we believe China's monetary policy will move in the direction of more market-based approach and further financial market development. However, the global financial crisis may have made the government more cautious about interest rate liberalization and financial market development, while the opening of the capital account and increasing exchange rate flexibility may move forward. Further structural reforms are necessary to reduce the state's ownership and control of resource allocation including in the banking system, and to change the growth model to reduce national saving and external surpluses.

The biggest risk is asset bubble and resource misallocation

The biggest risk is that excess liquidity abroad and at home, combined with artificially low interest rates, administrative controls, and distortions in the economy, will lead to over-investment, mis-allocation of resources, and asset bubbles, which would endanger the long-term sustainability of growth in China.

II. The background

- ***China's financial system and the central bank are still works in progress.***
- ***Substantial reforms notwithstanding, the state still plays a significant role in China's economy, especially in holding and allocating resources.***
- ***China has made significant progress in moving towards a more market-based approach to macroeconomic policy, but the role of monetary policy needs to be seen in the above context.***

When discussing the effectiveness of monetary policy or the role of various monetary policy instruments in China, we need to be very careful in plotting times series data to show correlations or run regressions and drawing seemingly very obvious conclusions. We need to keep in mind the significant structural changes over the past decades in macro institutions, policy instruments, and in the data.

The financial system – a work in progress

As demonstrated in the following key timelines, China's commercial banking system, equity and bond markets, and indeed the central bank itself as a separate policy institution are all recent creations and are still works in progress.

China's banking system and policy regulators are all recent (re)-creations

Table 1: Key timelines of China's financial system

Commercial bank	The central bank	Financial markets
Until 1979, monobank system where the PBC functioned as an extension of the fiscal authority and allocated funds according to the production plans; *1983*, specialty banks and the first commercial bank, industrial and commerce bank of China (ICBC) was established; *1994*, the special banks (agricultural bank, construction bank, etc) turned into true commercial banks; *1998-99*, the first big bail-out and bank recapitalization (about 18% of GDP) took place; *2003-08*, the second round of bank recapitalization and reform took place; *2010*, Bank of Agriculture, the last of the big four banks, was listed.	*1983*, with the creation of ICBC as a separate commercial bank, the PBC was designated as the central bank; *1995*, the PBC was legally institutionalized as the central bank; *1996*, the PBC started open market operations using treasury bonds; *1998*, the PBC abolished directed lending plans for commercial banks; *2003*, a separate banking regulatory commission was established to take over that role from the PBC; *2005*, the PBC ended the 10-year peg of RMB with the USD; *2006 and onwards*, the PBC started to use RRR to sterilize FX inflows.	*1990*, Zhengzhou futures market and Shanghai stock exchange were established; *1994*, China unified the official and exchange market exchange rates, and established interbank market for foreign exchange (CFETS) trading; *1997*, interbank bond market was established after the 1995 closure of treasury futures and OTC bond markets. Bond markets have since been segmented into the exchanges and interbank markets; *1996-97*, the PBC lifted controls on interbank market rates; *2004-05*, the share-structure reform took place to resolve the non-tradable share issue in the A-share market. *2009*, growth enterprise board (ChiNext) was established in Shenzhen

Source: PBC, Government documents, UBS estimates

Another important aspect of the Chinese policy environment is the historical lack of viable non-bank financial markets. Chart 1 and 2 below show that banks dominate as a destination for household liquid financial wealth, and as the source of financing for investment. This is all the more true since China also maintains a closed capital account, which makes it very difficult for households and firms to repatriate savings offshore or borrow abroad for investment needs.

Another important aspect is the lack of viable non-bank financial markets. Banks have always been the "only game in town"

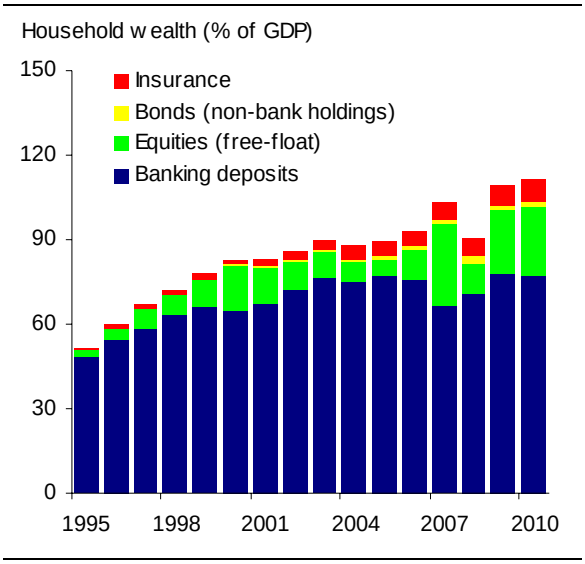
What does this mean for the economy? On the negative side, limiting the number of saving and investment channels automatically reduces the efficiency of capital allocation and has resulted in the dominance of banking in China's financial system.

This is negative for the economy since it reduces capital efficiency

However, one positive aspect is that it makes the financial system more forgiving of policy mistakes and allows the authorities time to develop monetary instruments. If financial markets don't play a significant role in the economy, then even large swings in market flows or pricing don't affect the broader economic picture too much.

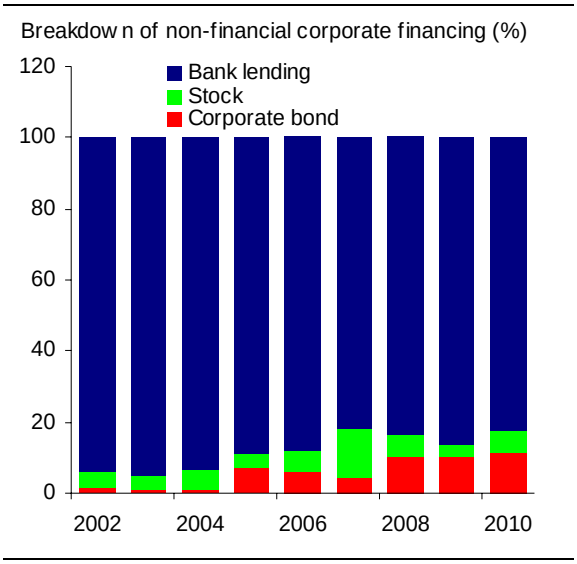
But it's also positive since it allows for more policy mistakes. Now the situation is changing rapidly, as the government liberalizes markets

Chart 1: Financial wealth holdings in China



Source: CEIC, Wind, UBS estimates

Chart 2: External investment finance in China



Source: PBC, CEIC, UBS estimates

The role of the state

Another crucial issue in the Chinese economy is the role of the state in commercial decisions and resource allocation. The role of the state is visible in: (i) direct ownership in the real economy; (ii) control and allocation of key resources including capital, land, and mineral/energy resources, often not according to market prices; (iii) majority ownership of most and the largest commercial banks.

The role of the state is an important issue for China's economy

After decades of organic private growth and gradual privatization, currently the state still directly owns roughly one third of the industrial sector. But this understates the importance of the state in the economy. Crucially, the state also still directly owns, controls, and allocates many key production resources, including land, mineral and energy resources, and capital. For example, all large investment projects, private or public, need the approval of the National

Today the state directly owns only 1/3 of the industry, but the bigger role of the state is in its control and allocation of resources

Development and Reform Commission, the all powerful economic policy agency. Only with the approval can the investors get access to land, credit and go ahead with the projects. The government also controls the supply of land for industrial, commercial, and urban residential usage.

The banking system remains predominantly state-owned; the government either maintains an absolute majority share, or exercises controls through state agencies and enterprises in most of the banks. It also appoints top bank managers as civil servants.

Table 2: Number of banks, assets, state ownership

	1990	2000	2005	2009
Number of banks	10	116	132	164
-Policy Bank (100% state owned)	0	3	3	3
-State Owned Commercial Bank (state-controlled)	4	4	4	4
-Share Holding Commercial Bank (largely controlled by SOEs)	6	10	12	13
-City Commercial Bank (mostly controlled by local governments or local SOEs)	0	99	113	143
-Postal Saving Bank (100% state owned)	0	0	0	1
Total assets (RMB bn)		13,743	31,814	67,204
Share in total assets (%)				
-Policy Bank		12.0	9.2	10.3
-State Owned Commercial Bank		73.8	61.8	54.7
-Share Holding Commercial Bank		11.1	18.3	22.5
-City Commercial Bank			6.4	8.5
-Postal Saving Bank				4.0

Source: CEIC, UBS estimates

The importance of the state means that the scope for formal and informal interference in commercial decision-making is still prevalent. For the most part the central government has been trying to promote a market-oriented and efficient banking system, but at times (such as in 2008-09) the natural inclination is still to use the banks like any other agency to promote growth. In addition, local and regional authorities have strong ties to their local banking counterparts (especially city commercial banks) and often heavily influence banks' behavior. Also, the majority state-ownership of the banks and the implicit guarantee of deposits by the government help banks to attract and keep deposits. In such an environment, both state lenders and state borrowers have an incentive to take excessive risks, on the view that capital is cheap and the state will always step in to cover losses. This puts the onus on the government to directly monitor and control state banks' balance sheets. Indeed, the calls on the banks to help boost growth during 2008/09 have increased the government's responsibility in this regard.

This means that formal and informal interference are still prevalent and banks and borrowers take excessive risks

The role of monetary policy and the central bank

Government oversight also means that the PBC is not independent

The strong role of the state in controlling and allocating resources in China has at least two important implications for the role of monetary policy and the role of the central bank. First, unlike developed countries, where central banks have both legal and functional independence and are (largely) free to pursue consistent policy aims, in China the PBC is subordinate to the State Council in monetary policy decisions. Macroeconomic and monetary policy targets, as well as the use of monetary policy instruments such as credit targets and interest rate adjustments, are formally decided at the State Council level, with conflicting interests from various ministries and agencies having a large influence on the process. Other stake holders such as local governments and state-owned enterprises often influence macro policy as well through the Party structure.

Implementation of monetary policy often needs the support of other government agencies

Second, even after the decision is made, the implementation of monetary policy targets often needs the support of other government agencies and measures as well. For example, at times of credit control, local governments' investment projects need to be brought under control through the NDRC and the Party structure, while at times of monetary expansion such as in 2009, the involvement of local governments (and the companies and platforms they control) plays a key role in ramping up investment.

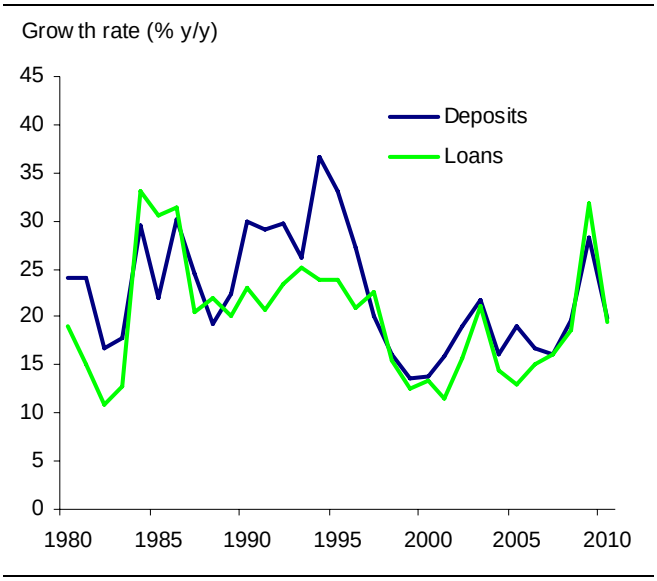
Nonetheless, the authorities have made great progress over the past decade, as reflected in the historical behavior of money and credit

Despite these historical handicaps and continued distortions, however, China has made significant progress over the past decade in gaining control over macroeconomic instruments and achieving economic stability. This is evidenced in the behavior of monetary aggregates. In the 1980s China saw fiercely overheated money and credit expansion, with growth jumping to 30% y/y and remaining at that pace for a number of years, before coming off sharply in the latter part of the decade (Chart 3). The same occurred in the 1990s: a protracted round of very excessive money growth followed by a sharp contraction. By contrast, in the few years before the global financial crisis, loan growth behaved more smoothly, and the huge spike in 2008-2009 started to settle back more quickly than in previous episodes.

The same is true for real growth and inflation. And the authorities have much more experience in managing the economy

In part because of less volatile monetary aggregates (and the completion of major price reforms), China has seen more stable economic growth and inflation over the past decade. Real GDP growth has averaged 10%, with small annual deviations, and inflation has been more modest and stable after the late 1990s trough. The improvement in macroeconomic stability over the past decades is partly attributable to the transformation of the economy – state-ownership and control over resources, while still substantial, has declined significantly compared to two decades ago. In addition, the government is now more experienced, after learning from the boom-bust cycles of the past. It has developed better macroeconomic policy tools, and the overall quality and consistency of policy making has improved.

Chart 3: Money and credit growth



Source: CEIC, UBS estimates

III. Monetary policy objectives and tool kit

- ***The objectives of China's monetary policy include achieving price and exchange rate stability, supporting growth, and aiding structural adjustment.***
- ***To achieve its policy objectives, the PBC targets monetary aggregates, using quantitative base money targets as its main intermediate policy tool, aided by direct administrative controls on overall credit growth and sectoral credit policies.***
- ***In recent years, base money targeting has effectively been achieved by adjusting the degree of sterilization of FX inflows, either through reserve requirement ratios or open market operations.***
- ***Administrative credit controls and prudential measures can be seen as a natural response to excess liquidity and remaining policy-related distortions in the economy, but they come with costs.***

The objectives and tool kit of monetary policy

The first aspect is the final policy target

The objective of monetary policy is the economic outcome that the authorities try to influence, which is the *final policy target* for central banks; this could be inflation, economic growth and employment, or a combination of multiple targets.

Next comes the intermediate target, either price-based or quantitative

The main policy instrument used to reach the policy target, or the *intermediate target*, can be either "price-based" such as a short-term interest rate or "quantity-based" such as the volume of base money supply[1]. The broader policy environment, including other administrative controls as well as the state of the overall financial system, also matters.

China's monetary policy objectives include growth and employment, inflation, currency stability and external balance

The objectives of monetary policy in China are similar to the government's macroeconomic policy objectives. These are relatively rapid economic growth, low inflation, external balance, a stable currency, and adjusting the economic structure. Monetary policy as a separate sphere of policy making is a relatively recent phenomenon – the PBC exists as a central bank since 1983, and was only formally institutionalized in 1995 through the law of the PBC. The formulation and conduct of monetary policy really gradually took shape since 1998, when China started to restructure its banking system.

The PBC targets broad monetary aggregates...

Since 1998, the PBC has accumulated experience in targeting broad monetary aggregates to help the government achieve the growth and inflation objectives. This is done in the following steps:

...by managing the quantity of base money supply and directly controlling credit growth

(i) When the central government (at the annual Central Economic Work Conference) establishes growth and inflation targets for the following year, the central bank sets a corresponding broad money growth target. A consistent credit growth target is then calculated and used as a guidance for commercial banks' working plans; (ii) The PBC adjusts the quantity of base money supply to indirectly influence broad money supply, and in the past few years the amount

[1] In the late 1970s and early 1980s most major developed central banks targeted quantities of monetary aggregates and maintained fairly strict controls on interest rates, capital flows and financial development. It wasn't really until the 1980s and beginning of the 1990s when Interest rate caps in the US and Europe were dismantled, credit controls were removed and external capital flows were liberalized.

of base money supply was controlled by the sterilization of FX inflows; (iii) administrative measures and quantitative credit targets are also used to directly control bank lending, the most important channel through which high-powered base money is leveraged into the economy; and (iv) sectoral credit policies are used to direct lending towards or away from certain sectors, in line with the government's objective on structural changes.

Monetary targets were sometimes overlooked to accommodate faster growth

This has been an evolving process, and sometimes the monetary aggregate targets set in the beginning of the year were grossly exceeded. In our view, missing the targets was not because the central bank's policy tools were ineffective, but because the central government decided to lean toward more growth rather than sticking with the original economic targets, and monetary policy accommodated the stronger growth outcome (Table 3).

Table 3: Targets and outcomes

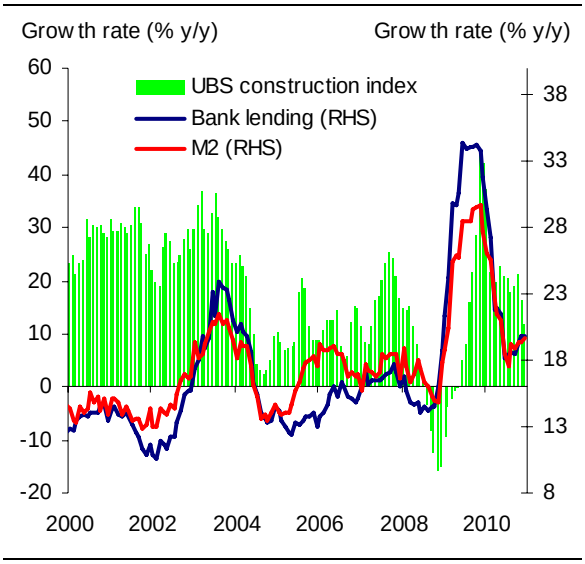
	GDP growth		CPI inflation		M2 growth		New loan		Loan outstanding growth	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Implied target	Actual
	%	%	%	%	%	%	RMB trn	RMB trn	%	%
1998	8.0	7.8	5.0	-0.8	16-18	15.3	0.9	1.1	12.1	15.5
1999	7.0	7.6	4.0	-1.4	14-15	14.7	1.0	1.1	11.6	12.5
2000	7.0	8.4	>=0	0.4	14-15	14.0	1.0	1.3	10.7	13.4
2001	7.0	8.3	1-2	0.7	13-14	14.4	1.3	1.3	13.1	11.6
2002	7.0	9.1	1-2	-0.8	13.0	16.8	1.3	1.8	11.6	15.8
2003	7.0	10.0	1.0	1.2	16.0	19.6	1.8	2.8	13.7	21.1
2004	7.0	10.1	3.0	3.9	17.0	14.6	2.6	2.3	16.4	14.5
2005	8.0	11.3	4.0	1.8	15.0	17.6	2.5	2.4	14.0	13.0
2006	8.0	12.7	3.0	1.5	16.0	16.9	2.5	3.2	12.8	15.1
2007	8.0	14.2	3.0	4.8	16.0	16.7	2.9	3.6	12.9	16.1
2008	8.0	9.6	4.8	5.9	16.0	17.8	3.6	4.9	13.9	18.7
2009	8.0	9.2	4.0	-0.7	17.0	27.7	>5	9.6	16.5	31.7
2010	8.0	10.3	3.0	3.3	17.0	19.7	7.5	8.0	18.8	19.9

Source: PBC, Government documents, UBS estimates

It is clear that China mainly uses quantitative instruments, not interest rates

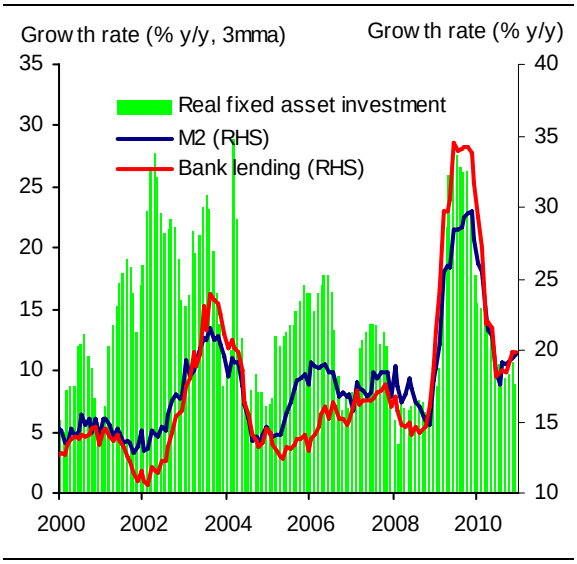
Nevertheless, it is clear that China uses quantitative targets and instruments in monetary policy management. Charts 4 & 5 show the tight correlations between bank lending and construction activity & investment. The pick up in 2002-03, the sharp slowdown in 2004, the surge in 2008-09 and the subsequent slowdown in investment and construction activity were due to intentional credit adjustment. Meanwhile, in comparison interest rates did not move much during those episodes.

Chart 4: Bank credit and real construction growth



Source: CEIC, UBS estimates

Chart 5: Bank credit and real FAI growth



Source: CEIC, UBS estimates

Many have questioned and are worried about recent expansionary monetary policy in China. Looking over the longer term (Chart 3 above), one can see that in the 1980s and 1990s money and credit growth jumped to 30% y/y and remained at that pace for a number of years before the subsequent downturn. By contrast, in the latest cycle loan growth spiked sharply but quickly slowed into a more stable range. We think this is a clear indication that monetary policy management has become more mature.

The 1980s and 1990s saw large, protracted volatility, whereas the recent surge in bank lending did not last that long

Managing base money supply and the use of RRRs

How does the PBC manage monetary aggregates through base money supply? In a "fractional-reserve banking system", which is what we have in China as well as in virtually every developed economy, central banks provide "high-powered" liquidity, or so-called base money, to commercial banks, who in turn use these funds to create new loans and deposits via the money multiplier.

Central banks provide base money and commercial banks lend it out

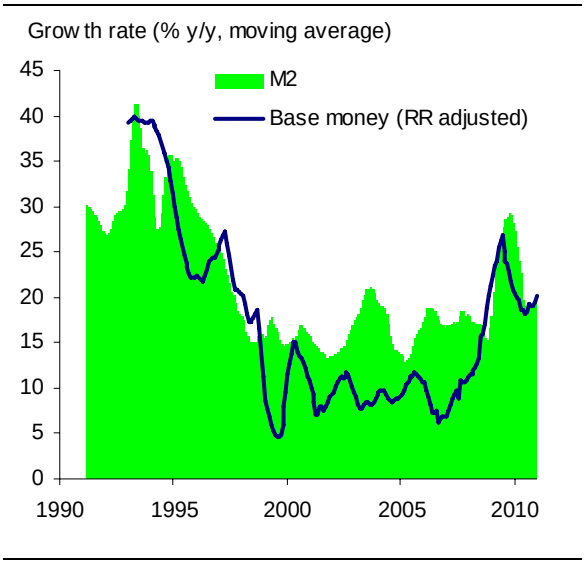
In China, the long-term relationship between "high-powered" base money growth and broad money (M2) growth was stable in the 1990s (Chart 6). The reason broad money and credit could grow at 30%+ y/y in the first half of the 1990s was that the PBC was emitting base liquidity into the economy at the same rate. And once the PBC tightened up on base money growth, the pace of overall M2 and credit expansion dropped as well. The relationship weakened substantially in much of the past decade before the global financial crisis, for reasons we will explain later.

The relationship between base money and M2 has weakened

Nevertheless, the PBC does adjust base money supply often (Chart 7). The recent loosening cycle in 2008-09 was obvious, and the tightening of base money supply also visible in 2010.

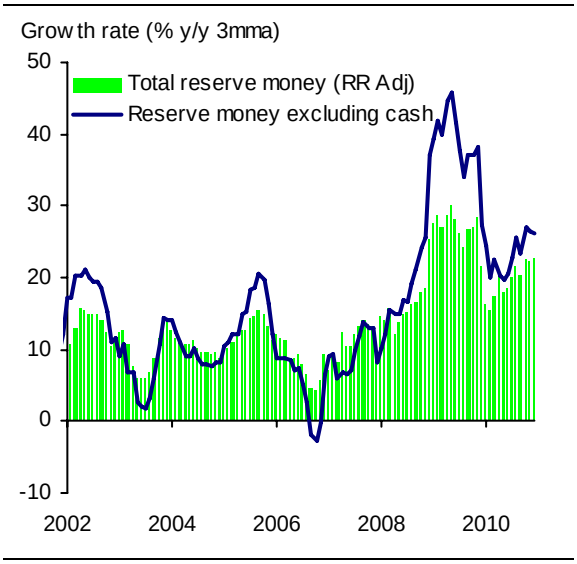
And the PBC has been very active in adjusting base money policy

Chart 6: Base money growth (long view)



Source: CEIC, UBS estimates

Chart 7: Base money growth (short view)



Source: CEIC, UBS estimates

How does the PBC adjust the quantity of base money supply? Looking at the balance sheet of the central bank, the asset side has foreign assets such as foreign exchange and gold, and domestic assets such as lending to domestic banks and the government (government bonds). A central banks' liability includes reserve money – cash issuance and deposits that commercial banks have at the central bank – and central bank's bond issuance.

A central bank has foreign exchange and claims on government and banks as assets, and reserve money as the main liability

Table 4: Balance sheet of the central bank

Asset	Liability
Foreign asset	**Reserve money**
o/w Foreign exchange asset	Currency issue
Domestic asset	Deposits of other financial institutions
claims on government	**Central bank bond issue**
claims on other financial institutions	Deposits of government
claims on non-financial institutions	Own capital
Other	Other

Source: PBC, UBS estimates

The PBC can increase base money supply by purchasing foreign exchange from commercial banks (which may have gotten it from exporters) with renminbi, or by directly providing liquidity (through on-lending facility, for example) to commercial banks. This is essentially what happened before end 2002. Since 2003, however, as foreign exchange assets grew rapidly, the PBC had to manage base money supply by adjusting the magnitude of sterilization of the FX inflows.

Purchasing FX from commercial banks will increase base money supply by the same amount...

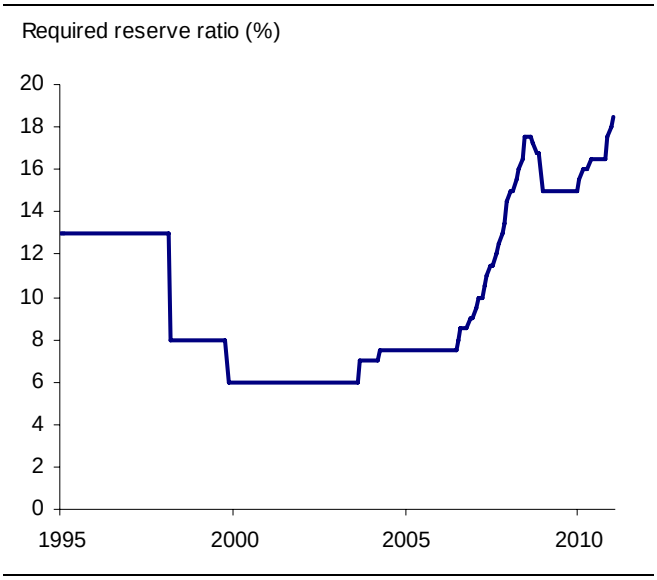
... unless the PBC "borrow" it back by issuing central bank bills...

Table 4 above shows that an obvious way to sterilize an increase in FX assets is to reduce domestic assets – by selling PBC's holding of government bonds for example. However, the PBC did not hold many government bonds. So from September 2002, the PBC started issuing central bank bills to mop up the liquidity generated from the FX inflows, so as to contain base money supply.

...or "freeze" it through required reserve ratios

However, there are some drawbacks to central bank bills. They need to be rolled over constantly, and they are also costly, especially as FX inflows continued to balloon. So in 2006, the PBC started to use the required reserve ratio (on deposits in commercial banks) as a sterilization tool to manage liquidity. Since the beginning of 2010, the PBC raised the RRR by 7 times to mop up liquidity, but again causing some confusion among investors.

Chart 8: The frequent use of RRR



Source: CEIC, UBS estimates

Reserve requirement hikes freeze liquidity "permanently" and at lower costs, a useful option when China faces persistent large external surplus

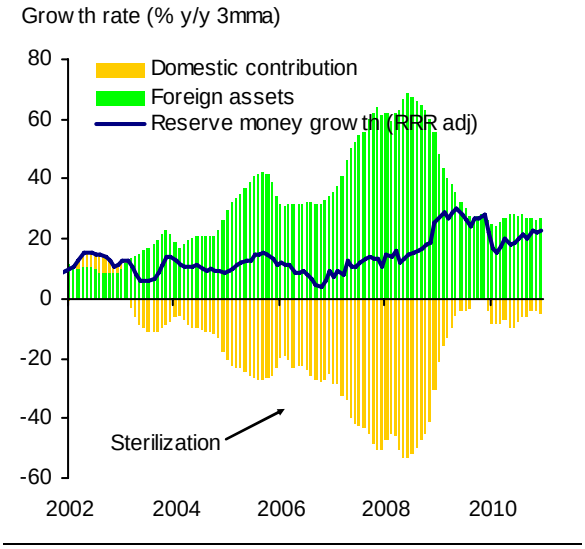
From a central bank perspective, using the required reserve ratios freezes funds permanently at least until it decides to lower the ratio again. Moreover, the PBC does not have to pay a market interest rate on required reserve deposits (the remuneration is now 1.62% per annum, compared to 2.72% for 1-year central bank bills). As China has been faced with large and chronic external surpluses since 2003, and the stock of short-term central bank bills has increased, these advantages of RRRs are important. Charts 9 & 10 show how the PBC has used different sterilization tools over the past decade to manage base money supply.

The PBC said it will use differentiated RRR adjustment in 2011

In 2011, the PBC has expressed its intention to apply differentiated RRRs to commercial banks, with the bank-specific RRR determined by factors such as capital adequacy ratio and loan growth of each particular bank. While it is not clear how this will actually be implemented, we do not expect the new method to yield any material difference in terms of credit growth or monetary policy stance (see "*What's New with Monetary and Credit Policy in 2011 (Transcript)*", January 13, 2011)

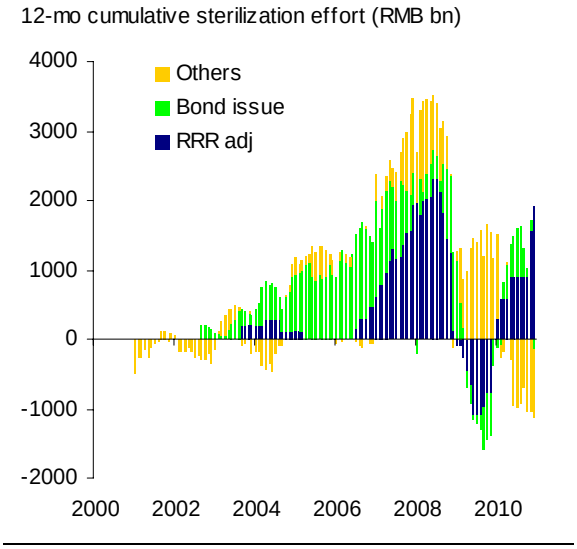
Notwithstanding the benefit, using RRRs for sterilization shifts part of the costs to commercial banks, and can not go on forever. We will discuss more about these in section V below.

Chart 9: Base money growth by component



Source: CEIC, UBS estimates

Chart 10: Sterilization operations



Source: CEIC, UBS estimates

Administrative controls

In addition to base money management using tools such as RRRs, there is a second set of tools that the government uses to affect broad money supply. Chart 7 above already showed well that the correlation between base money supply and M2 growth broke down in recent years. Specifically, the slowdown in credit growth and construction activity in 2004 and end 2007-early 2008, were both much more pronounced than the underlying slowdown in base money growth in Chart. Why?

Base money management is not the only tool to manage broad money supply

The answer is direct quantitative credit controls on the banking system. This involves PBC and the banking regulators using prudential regulations and/or directly pressuring banks to rein in growth or face sanctions in the form of liquidity penalties.

The PBC also uses direct administrative controls to help policy

Prior to 1998, the government (through the PBC) gave out lending plans to individual banks (the big four). Since then, the lending targets have become softer over time, usually providing only guidance. However, at times when bank lending was growing too fast, such as in late 2003, late 2007, and early 2010, the authorities took more aggressive actions. These actions included forcing banks to call back loans (2003-04), virtually freeze new lending (end 2007), and imposing quarterly and monthly lending quota (early 2008, and 2010).

Normally the PBC only uses window guidance in a preventative sense

Why do the authorities also rely on administrative controls? (i) The banking system traditionally had a high level of excess reserves – tightening base money took too long to have an immediate effect; and (ii) the over-lending and over-investment issues were often highly skewed to a few sectors: property, mining and heavy industry, for example, while other sectors were facing more reasonable capacity expansion and no real signs of overheating pressures.

Why does the PBC use administrative controls? Because of excess liquidity and sector-specific overheating

Box.1 Does RRR hike tighten liquidity conditions? – an example

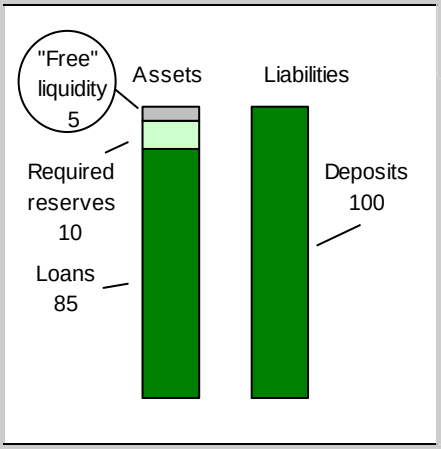
Every time the PBC raised RRR in the past few years, the media and market participants called it monetary tightening. Certainly, a RRR hike would leave less liquidity for banks than without a hike, but it does not necessarily mean that liquidity conditions would be tighter than before the hike; that depends on whether the amount of funds withdrawn by "freezing" them in required reserves is lower or higher than the gross liquidity inflow from FX reserve purchases.

A simple example will help. Let's start with a hypothetical snapshot of the aggregate commercial banking system balance sheet in Chart 11. On the liability side, commercial banks have RMB100 in total deposits. On the asset side, banks have loans outstanding to the rest of the economy in the amount of RMB85, and funds on deposit with the PBC amounting to RMB15. This latter figure is base money, i.e., total liquidity created by the central bank, and can be broken into "required" reserve deposits and excess ("free") reserve liquidity. The required reserves are effectively frozen, as banks can't use them to increase lending or invest in other assets, but remaining RMB5 could potentially be used for other purposes.

Now let's assume there is a large trade surplus, and companies now come to the banks to convert the extra foreign exchange to domestic currency – equal to RMB10. Banks take RMB10 worth of FX from exporters and create new RMB deposits for them in the same amount. Next, commercial banks go to the PBC to exchange the FX for RMB. As a result, the PBC's official FX reserves rises by RMB10, and in return credits commercial banks with RMB10 in new deposits on their central bank reserve accounts. Now the commercial banks' balance sheet looks like Chart 12, their "free" liquidity has jumped from RMB5 to RMB 14. If the PBC doesn't take measures to bring those excess balances back to more normal levels, banks are likely to start lending aggressively into the real economy.

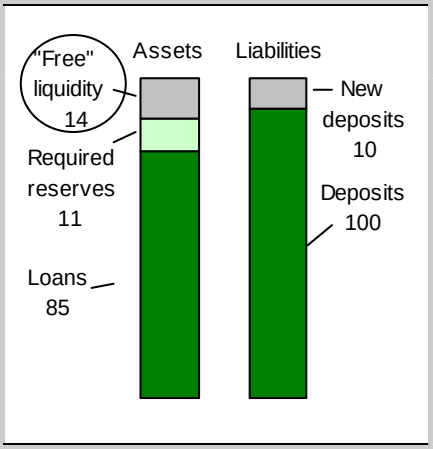
If the PBC raises RRR from 10% to 18%, it can force banks to set aside all of the new liquidity inflows arising from FX purchases. As shown in Chart 13, banks' free liquidity is right back at the original RMB5 level. Therefore, in the case of increased FX inflows, raising required reserves significantly may just bring policy back to a neutral stance, not a tighter condition. Liquidity conditions in Chart 13 (with a RRR hike) is tighter than in Chart 12 (without a hike), but not tighter than in Chart 11 (before the surplus and the hike).

Chart 11: Commercial banks (1)



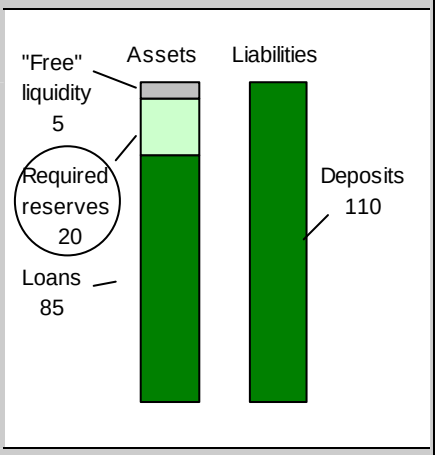
Source: UBS estimates

Chart 12: Commercial banks (2)



Source: UBS estimates

Chart 13: Commercial banks (3)



Source: UBS estimates

In this environment, the authorities thought that economy-wide tightening would have had a disproportionate impact on the "good" part of the economy, which would see their funding costs increase and margins decline. Meanwhile, tighter overall credit conditions might not have had an effect on demand for inefficient, redundant industrial projects, since state-led and speculative borrowers are far less focused on the return to capital.

Administrative controls try to target the "overheated" sectors, not the overall economy

At the beginning of the decade, the excess reserve ratio was around 10%, coming down only gradually in the middle of the past decade (Chart 14). This is supportive of the first argument. However, excess reserve ratio has come down to about 2 percent in the past 12 months, yet the government has continued to rely on administrative measures. Therefore, we think the second factor is the main reason.

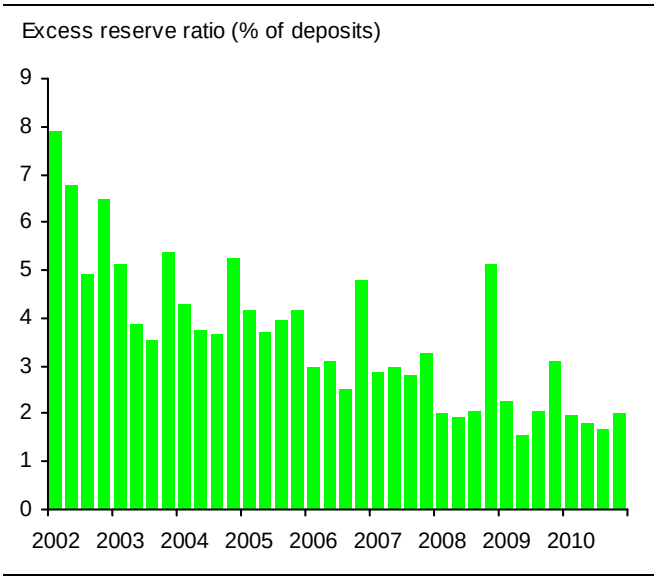
The excess reserve ratio has come down

Are administrative controls not distortionary?

Of course they are. Using administrative controls means that banks have to ration loans to the economy instead of allocating them to the most profitable sectors and firms. The close relationship between state-owned enterprises, local governments, and the banks mean that credit is more easily available to the connected companies and projects, at the cost of private and small and medium enterprises. In addition, in this environment, credit risks may often be overlooked or under-estimated, and credit may be given to repetitive projects or to sectors already with excess capacity. In the end, the misallocation of capital contributes to increased non-performing loans and to repeated episodes of over-investment in various sectors.

Administrative controls results in credit rationing, leading to resource misallocation and increased risk of NPLs.

Chart 14: Banking system excess liquidity



Source: PBC, CEIC, UBS estimates

That said, there's a large difference between the detailed state interference to allocate capital and credit on a sector-by-sector or project-by-project basis of the past, and general controls on the overall pace of credit growth of the current time. The former is more distortionary at every level and runs counter to the

There's a big difference between detailed credit allocation and more general controls on overall credit

fundamental operation of a market economy, and has been abandoned as a policy in China since 1998. Of course, there is still a regular practice of preferential credit treatment at the local level, with local governments intervening in lending decisions to allocate resources to favored projects, but not as all encompassing as in the 1980s and 1990s.

Theory says that economic distortions can be met with other distortions

In addition, economic theory also teaches us that non-market distortions may be better dealt with through similar non-market actions (this is the theory of "second-best"). Given the remaining distortive role of the state in the mainland economy, overall credit controls may work the best to achieve the macro economic objectives at hand.

Base money management will become increasingly important when excess reserve ratio falls

And finally, over time, as banks no longer have large excess reserve balances, base money management will become increasingly more effective, while administrative controls and window guidance will be less important.

IV. Interest rates

- ***Money market and bond rates are market-determined, but China still controls two important sets of interest rates: (a ceiling on) deposit rates, and (a floor on) lending rates.***
- ***Official PBC policy rates are rarely used and not meaningful, but the central bank bill rates used for sterilization have become quasi policy rates.***
- ***The main purpose of continued commercial bank interest rate controls is to prop up net interest margins in the banking system.***
- ***Deposit rates would clearly rise if they were liberalized, but there are structural reasons why the overall level of interest rates is low in China.***
- ***The rebalancing that the government aims at would reduce some structural drivers for high saving; thus over time rebalancing would be consistent with higher interest rates.***

Among the various interest rates used in China today, the most important ones are short-term money market rates and commercial bank deposit rates (Table 5).

Table 5: China's Interest Rates

Types of rates	What they are	Level at end 2010	Controlled/free	Importance
PBC policy rates				
On lending rate	Rate at which the PBC provides refinance credit on a fixed-term basis to financial institutions	3.85 (1-yr)	Controlled	Rarely used
Rediscount rate	Rate at which commercial banks re-discount commercial bills to PBC to get liquidity	2.25	Controlled	Rarely used
Required reserve rate	Rate of remuneration on required and excess reserves	1.62 for required reserves 0.72 for excess reserves	Controlled	Somewhat
PBC bill yields	Yields on PBC bills used for sterilization	2.51 (1-yr issuance rate)	Semi-controlled	Important
Money market rates				
CHIBOR	Trade-weighted interbank rates	6.50 (7-day)	Free	Somewhat
SHIBOR	Average of participating banks' fixing of offered rate at 11:30 am each day	6.39 (7-day)	Free	Important
Interbank repo rate	Rate of interbank repo transactions	5.17 (7-day)	Free	Important
Bond yields and Benchmark rate				
Bond yields	Yields on government and quasi-government bonds	3.86 (10-yr treasury bond yield to maturity)	Free	Not really
Benchmark lending & deposit rates	Rates that commercial banks charge their borrowers or pay their depositors	5.81 (1-yr lending) 2.75 (1-yr deposit)	Controlled	Important

Source: CEIC, UBS estimates

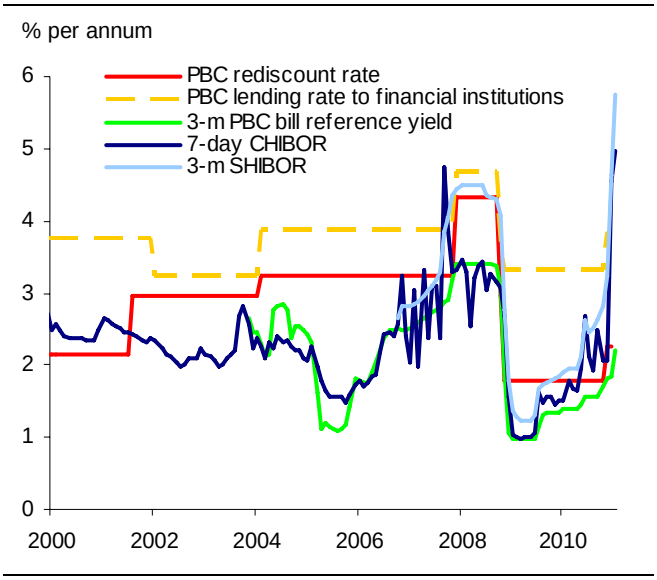
Central bank policy rates. The PBC quotes a range of benchmark policy rates on direct monetary operations, including a policy lending and discount rate. However, the PBC's lending and re-discount windows have been effectively closed for the past few years and these rates are rarely used. This is because, amidst excess liquidity, banks do not need to come to the PBC to borrow and hence not affected by those lending rates (an exception took place at end December 2010 when market liquidity became tight and the PBC raised the on-lending and rediscount rates). As Chart 15 shows, there is little correlation between PBC policy rates and money market rates.

The PBC policy rates are hardly used and has no correlation with money market rates

In recent years, the yield on PBC bills (debt paper issued at various maturities for sterilization purposes) is seen as a quasi policy rate. The yield on PBC bills is set in twice-weekly auctions with commercial banks in a "semi-floating" manner. We say semi-floating since the PBC bill auctions are done in fixed-volume structure where the yield is set competitively and fixed-yield structure where volumes can vary widely. In addition, the PBC has sometimes cancelled auctions when it appeared that the yield demanded by commercial banks was "too" high. Money market rates move closely with PBC bill yields (Chart 15).

Yields on PBC bills is a semi policy rate, set in a "semi-floating" manner, and is linked with money market rates

Chart 15: PBC policy rates and money market rates



Source: CEIC, UBS estimates

Money market rates and bond yields. Money market rates are essentially free market rates, driven mainly by interbank trading and set independently according to underlying supply and demand conditions. The National Interbank Funding Center records daily trading results as so-called CHIBOR (China interbank offered rate) rates. The government introduced a Shanghai-based market maker system, or SHIBOR, in 2007 to achieve a more stable market especially for transactions of 90 days or longer. The SHIBOR rate is set in a similar way to LIBOR, with the rate calculated as an arithmetic average of the fixing of offered rate at 11:30 am of each business day by participating banks.

These are free market rates: CHIBOR is a trading average, but lacks volume and can be volatile; SHIBOR is a daily fixing to provide stable rate guidance

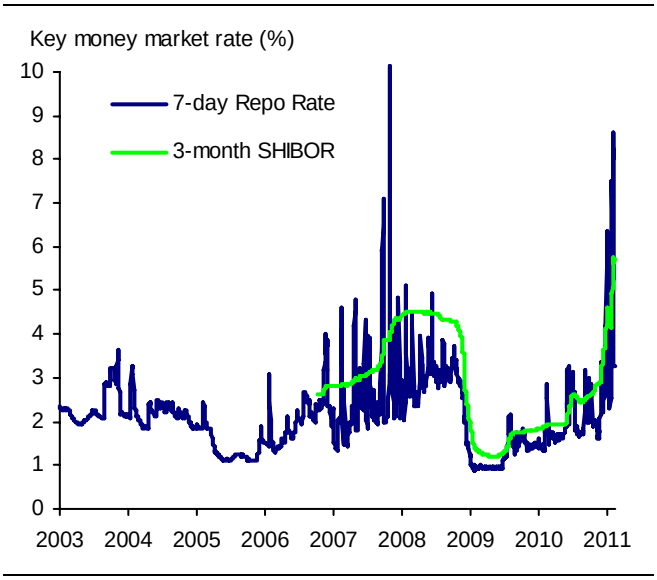
In recent years, the interbank repo market has far outsized the CHIBOR market in turnover and liquidity, and the 7-day repo market rate has replaced CHIBOR to be the most important short term money market rate. Market sees the 7-day Repo and 3-m SHIBOR rates as the best indicators of interbank market liquidity and benchmarks for pricing other financial instruments.

The 7-day repo rate and 3-month SHIBOR are the most important short rates

Money market rates are the best real-time "barometer" of monetary conditions in China. Since the PBC adjusts the quantity of money supply rather than the price of money, short-term money market rates are the only interest rates that react immediately to changes in the supply of liquidity in the system. As shown in Chart 16, 7-day repo rates spiked up when the PBC hiked reserve requirements, or a large company issued a domestic IPO, indicating a relative shortage of funds in the market. And then rates have inevitably come back down as new daily FX reserve inflows have replaced the lost liquidity.

Money market rates respond to the PBC's base money liquidity adjustment

Chart 16: Money-market rates on a daily basis



Source: CEIC, UBS estimates

These short-term rates also matter because they increasingly represent the marginal cost of funding to smaller banks and non-bank financial institutions in the system. Larger state-owned commercial banks account for the lion's share of deposits in the system, and in the past two to three years we have seen a shift in net borrowing pattern, which many smaller institutions becoming chronic net users of short-term money market funds in order to finance new growth.

Money market rates also directly affect the cost of funding

On the long end of the curve, almost all of the action is driven by government bonds – a reflection of the extremely restrictive administrative controls on corporate bond issuance to date. National treasury bonds, together with related policy financial bonds, account for roughly 82% of total outstanding long-term securities and an even greater share of market trading and turnover.

Government bonds make up most of the long end

Bonds account for only a small fraction of Chinese financial assets

In developed countries, bond yields play an important role in determining the overall cost of capital and in passing inflation expectations through to the rest of the economy. In China, the bond market is small and bond yields do not really matter. As of end-2010, the total stock of Chinese bank deposits was roughly RMB 72 trillion, compared with 16 trillion of total outstanding corporate and government bonds, less than 4 trillion of which were held by outside of the banking system itself.

Strong restrictions on corporate issuance and conservative fiscal policy are the main factors inhibiting bond markets

Why do bonds not play a bigger role in the Chinese economy? There are strict controls on corporate bond issuance and a complicated supervisory structure restricts the development of the bond market. Also, China has maintained a relatively conservative fiscal policy and new government issuance has been limited until the recent financial crisis. In addition, the high levels of liquidity in the banking system reduced the demand for a corporate bond market.

Benchmark rates are set by the PBC ... although lending rates float higher

Commercial bank lending and deposit rates. Commercial banks' benchmark lending and deposits rates are the most talked about interest rates in China – they are directly controlled by the PBC and the headline news on rate hikes/cuts refers to their adjustments. In 2004, the PBC removed the floor on deposit rates and allowed lending rates to vary between 10% less and 90% higher than the benchmark.

The real issue is deposit rates, which are held artificially low in China

In practice, deposit rates are fixed at the level of the ceiling. Chinese banks compete intensely for deposits, which mean that they cannot feasibly offer deposit rates below the published benchmark level. In fact, if the government were to completely liberalize interest rates tomorrow we believe average deposit rates would rise sharply (about which more in the final section below).

Average lending rates have already risen above the reference floor

By contrast, average lending rates deviate from the benchmark floor, as commercial banks either raise or lower their effective rates according to demand and supply. PBC data show that, between 2004 and early 2008, roughly 48% of loans outstanding carried an interest rate above the reference floor, with an average upward margin of around 35%, or some 200 basis points. This changed in 2009, when a majority of new loans went to government projects and interest rates were often lower than the reference. Since 2010, however, loans with higher-than-benchmark rates have started to rise again.

The PBC has been raising reference rates since 2005, but rate hikes often follow inflation

The behavior of benchmark lending and deposit rates over time is shown in Chart 17. Rates were relatively high in the inflationary period from 1990 to 1995, and then fell sharply in the latter part of the decade, with deposit rates set well below lending rates. Since 2005, the PBC has become more active in adjusting benchmark rates, but generally to *follow* inflation, not to lead it in a counter-cyclical manner.

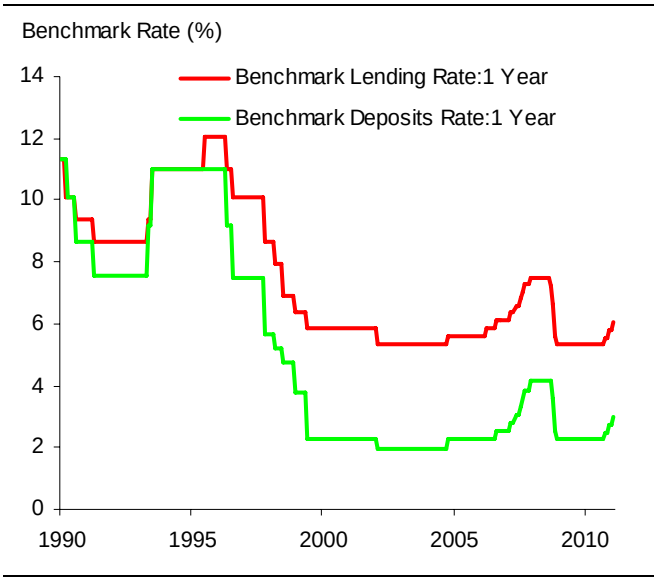
PBC does not move rates much compared with other central banks...

Interest rate moves were very rare between the late 1990s and 2004, and are still not as frequently used as in most other economies. As shown in Chart 17, the PBC has kept the reference rate quite stable in recent years, with changes less frequent than in most other economies – Japan is about the only major economy that moved interest rates less frequently than China, but of course Japan has pursued a "zero" interest rate policy for much of the past decade.

The key reason why the PBC does not use interest rate tools more is because it targets the *quantity* of monetary aggregates instead of the price, and relies on administrative credit controls as well to rein in bank lending, for reasons we have discussed earlier. Also, the central bank does not have policy autonomy - rate decisions are made by the State Council and require agreement of many agencies.

...because it targets the quantity of money supply and lacks policy autonomy

Chart 17: Commercial bank reference rates



Source: CEIC, UBS estimates

How do official bank lending and deposit rates matter?

Commercial bank lending is the most important source of outside financing for investment, which means that bank lending rates effectively determine the marginal cost of capital for the economy. One would think lending rates matters a great deal for real growth and inflation in China. That is perhaps why market and analysts often react strongly to any news of PBC rate hikes.

Obviously bank lending rates "matter" for the corporate cost of capital

However, while lending rates matter for the cost of capital, they have not been the binding constraint for the amount of bank lending in the system. One key reason is that rates are quite low, especially when compared with returns in the economy, and demand for lending is very large at such low rates. Raising rates at the margin does not affect the amount of bank borrowing. Also, local governments and SOEs are large borrowers who often discount the costs of funding as long as they can get funding.

But lending rate does not affect the amount of lending at the margin

This is not to say that very large official rate increases (hundreds of basis points, for example) wouldn't have a significant impact on the economy, but it does help explain why changing reference rates at the margin has not had any real effect on growth over the past few years.

In contrast, the deposit rate ceilings are binding and play an increasingly important role in the Chinese economy. Nearly every commercial bank in the country quotes deposit rates that are exactly at the reference ceiling, implying that the market-clearing "equilibrium" deposit interest rates are above official ceiling, i.e., deposit rates in China are held artificially low. As we will show below, this has potentially significant repercussions in asset markets, especially when nearly all financial savings are held in the banking system. So while changing deposit rates at the margin doesn't affect the corporate cost of capital, it directly affects the return earned by households and firms on deposit asset holdings and thus affects relative asset prices.

Reference deposit rates are binding. Adjustments to deposit rates directly affect returns and asset prices

Why does China have interest rate controls?

The days of dictated credit allocation are long gone, and both the central government and the financial regulators are actively pushing banks toward more market-oriented behavior, including commercial lending decisions, internal governance controls, risk management systems, rigorous audits and the like. So why bother with continued interest rate controls?

Why does the PBC maintain floors and ceilings on bank rates?

Many believe that this is to ensure low cost of capital for state firms. However, as we show below, Chinese real lending rates are not low by East Asia standards. Also, the authorities keep a *floor* on bank lending rates, not a ceiling. So banks could have raised lending rates substantially if they wanted to.

The answer is ***not*** to ensure low cost of capital for state firms

On the deposit side, many analysts have focused on the need to keep the return on domestic liquid asset holdings low to avoid foreign capital inflows and ensure that intervention and sterilization operations remain profitable. We agree that this has been a source of concern for the PBC over the past few years. But ceilings on deposit rates outdate China's balance of payments surplus by many years. Moreover, the evidence shows that external capital controls are still binding (see further below).

Nor is it to keep sterilization costs low

In our view the main reason for interest controls is to protect (state) bank margins. As shown in Chart 17 above, commercial bank deposit and lending rates were virtually identical at the beginning of the 1990s – but by the end of the decade, the government had inserted a large "wedge" between deposit and lending rates, effectively ensuring that commercial banks had some of the widest net interest margins in the Asian region and in emerging markets more generally.

Rather, the main reason for controls is to protect state bank margins

What happened in the 1990s? For the banking system, first there was the explosion of credit growth in the 1991-95 bubble, followed by the macroeconomic hard landing, a sharp drop in corporate profitability, and the restructuring of the state-owned enterprises in the second half of the decade. As a result of this boom-bust cycle, most independent analysts estimate that anywhere from 50% to 60% of the loans given prior to 1996 went bad. The government was forced to artificially increase net interest margins by a considerable amount in order to ensure that state banks continued to see positive cash flow.

During the 1990s banks ended up with very large NPLs. And the government pushed up interest margins to keep banks profitable

China initiated aggressive non-performing loan write-offs and bank recapitalization in 1999. The last major state bank to undergo restructuring with state-recapitalization was the Agricultural Bank of China, which only completed the process in 2008. In the boom years before end 2008, profitability in the banking sector grew strongly. However, following the credit expansion in 2009-2010, the government is concerned that banks have once again taken on some potentially bad debt from local government investment platforms. Thus, it will likely protect their margins for quite a while, since net interest income still accounts for about 80% of banks' revenue. Our UBS banking research team calculates that a 100 basis-point increase in deposit rates across the board, other things all equal, would reduce large banks' pre-tax profit by half.

The government has written down the bad debts of the 1990s, but banks may have taken on some bad debt in the recent credit surge

Are interest rates "too low"?

One of the most common understandings on China internationally is that interest rates are held artificially low. Many also believe that interest rate liberalization is one of the most important reforms that can change the structure of the economy (and the financial system).

Most interest rates in the system are flexible and set increasingly according to market conditions. However, this is in an environment where the bulk of national savings is effectively trapped in commercial bank deposit accounts earning an artificially low return, and the entire rate structure is biased downwards. With nominal GDP growing at 15% on average over the past decade, shouldn't average lending rates be of a similar magnitude, instead of the 6%?

Shouldn't average rates be the same as the nominal growth rate?

We agree that deposit interest rates are set too low in China, but, overall rates don't look extremely low by Asian historical standards. More importantly, there are structural reasons why lending rates do not rise much from the benchmark floor.

Deposit rates are too low – but that doesn't mean overall rates are too low

The "rule of thumb" that nominal interest rates should be equal to the nominal growth rate in the economy (or, equivalently, that the marginal product of capital should be equal to real GDP growth) holds up fairly well over time in developed economies, and this helps explain its popularity among global investors.

The "rule of thumb" on nominal rates holds well in developed countries...

But this rule of thumb has never applied to high-growth, high-saving Asian economies. Chart 18 shows the behavior of real interest rates (using the average of lending and deposit rates) in Japan and the four Asian "tigers" over the past four decades, and Chart 19 shows the average level during the peak growth period. Average real rates were barely above zero in Japan and around 2.5% in the Asian tigers, far below the real rate of economic growth in every case.

...but has never held in high-growth Asia

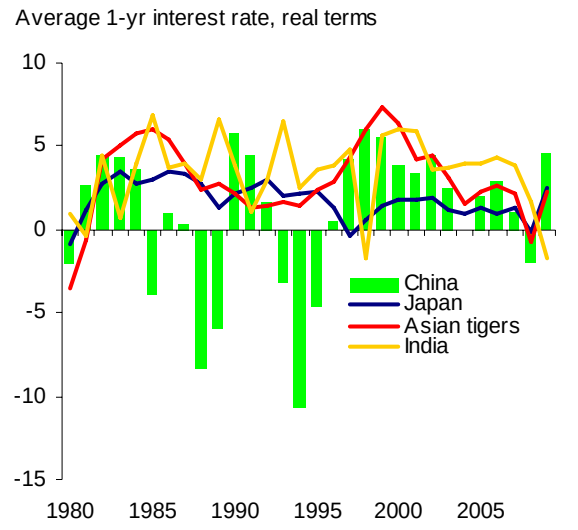
Why were interest rates so low compared to growth rates? The single biggest determinant of real interest rates in the region has been the domestic savings rate. With average savings ratios of 35% to 40% of GDP during their high-growth periods, more than twice as high as in the US or the EU, these Asian economies were able to sustain much higher investment ratios and thus much higher growth rates than their developed counterparts, but also with lower average returns to capital and lower interest rates.

In high savings economies, the marginal product of capital is lower

It should come as no surprise that China, with domestic saving rates now over 50% of GDP, shows a similar result; defined using the average of lending and deposit rates, real interest rates have fluctuated between 1% and 2% per annum since 1980, very much in line with regional experience.

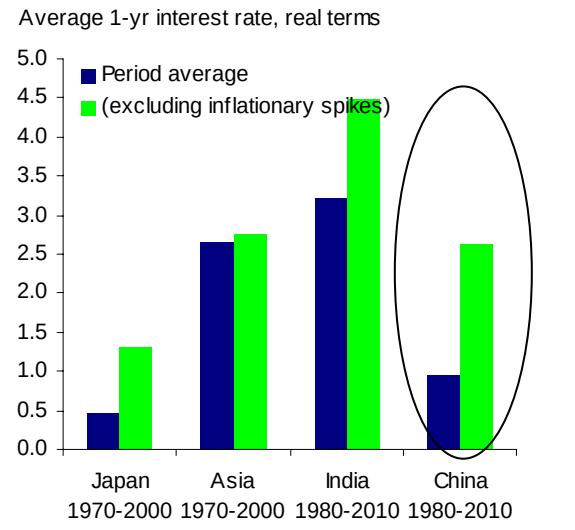
And in China real rates have been 1% to 2% per annum

Chart 18: Real interest rates in Asia since 1980



Source: CEIC, UBS estimates [2]

Chart 19: Average real interest rates in Asia



Source: CEIC, UBS estimates

High saving rate and interest rate liberalization

In principle, interest rate liberalization in China should result in significantly higher deposit rates as well as an upward shift of the entire interest rate structure. The rate liberalization should then lead to more appropriate pricing of capital, higher returns to depositors, increased competition among commercial banks to provide better products and cut costs, stronger incentives for banks to price risk appropriately, and therefore, better allocation of capital between large state-owned enterprises and smaller private firms.

Interest rate liberalization should lead to higher interest rates, more competition, and better capital allocation

However, in the current environment, without any other structural reforms, we think interest rate liberalization is unlikely to yield these positive results. Sure, smaller banks will bid up the deposit rates, but these banks are not necessarily better run or less influenced by government, and certainly not better supervised. Interest rate liberalization alone will not really change the fundamentals that underlie the high saving rate in China, which, in turn, will continue to hold down the overall rate structure. If the real lending rate remains low, the impact on improving capital allocation will be limited. And, if interest rates are somehow forced higher without the structural reforms, it may result in a blow up of current account surplus (saving-investment balance).

However, these positive results are unlikely achieved without other structural reforms

[2] We use the average of published bank lending and deposit rates for each country in question, and have attempted to come as close to a standard one-year rate as possible within the constraints of the data.

Are there policy-related distortions that push up saving rate in China?

Instead of focusing on interest rate liberalization, we need to understand why China's saving rate is so high, and whether there are policy-related distortions that need to be addressed.

Why does China save more than even the high-saving Asian economies of the past?

Why is saving so high in China? Running at more than 50% of GDP, China saves more than even the high-saving Asian economies in the past. A widely held view is that Chinese households save a lot due to the lack of proper social safety net – pension and health care insurance. However, this alone is far from convincing in explaining China's household saving rate, and certainly not the high national saving rate, which also includes saving by the corporate sector and the government.

Lack of social safety net is not the only reason why household saving is high. The low dependency ratio of working age population is an important factor…

On household saving, China's social safety net has not worsened in the past decade, and is in general better than most developing countries with a similar income level, and thus can unlikely explain the increase in household saving rate in this period. Academic research has found robust link between saving rate and dependency ratio of the working age population. In the case of China, dependency ratio dropped sharply in the 1980s when the "one-child" policy was initiated, has gradually declined since then, and is among the lowest in the world (Chart 20). However, quantitatively speaking, the impact of demographic developments is unlikely to be large enough to explain all of the increase in saving.

…as is increasing income disparity

In addition, researchers at the World Bank have found that increasing income disparity contributed to high and rising household saving rate in China, as higher income households in China save much more than the other groups and have seen their income rise substantially faster than others.

What really makes China stands out is the high corporate saving rate, which are at least partially driven by policies

What makes China stand out, though, is its high corporate and government saving (Chart 21). As we discussed in our earlier report (see "*How Will China Grow? Part IV: Can Consumption Lead Now?*", *4 May 2009*), certain policy-related distortions have contributed to the high capital-intensity of growth and high corporate saving. They include: keeping key factor prices for industry such as land, resource and energy relatively low; not requiring SOEs to pay dividends and leaving their earnings in the companies for future investment, which helps to drive down the cost of capital; maintaining a quasi-fixed exchange rate with a closed capital account that helps to generate and trap domestic saving at home; and limiting access of smaller and private enterprises to credit and capital market, which also drives up corporate saving.

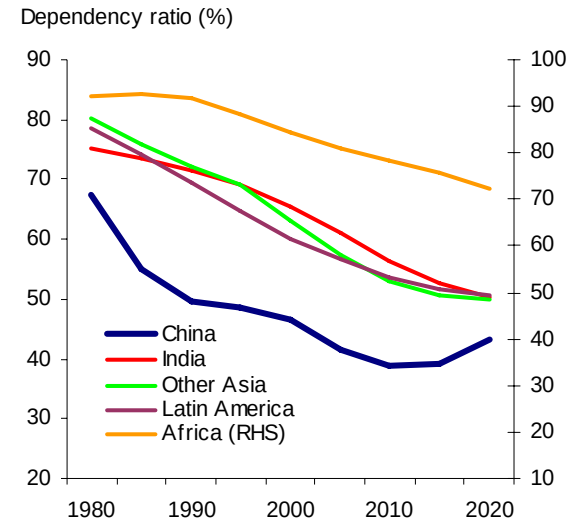
Improving capital allocation also requires the reduction of policy distortions

Therefore, to improve capital allocation in the economy, it is far from sufficient to just remove controls on commercial bank interest rates. It requires fundamental structural reforms to reduce distortions that accentuate the high saving rate.

Carrying out structural reforms should gradually lead to a lower saving rate, and thus, higher interest rates

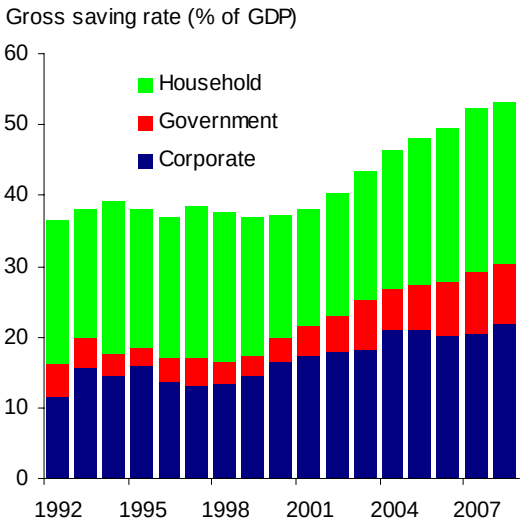
The government has outlined far-reaching structural reforms in the 12th Five Year Plan to rebalance the economy, including adjusting resource and energy prices, increasing SOE dividend payment, promoting the development of labor-intensive sectors, developing capital markets, increasing the flexibility of the exchange rate and gradually opening the capital account, and improving social safety net and income distribution. These structural reforms, if seriously implemented, should gradually lead to a lower saving rate.

Chart 20: Dependency ratio of working age population



Source: United Nations, Haver, UBS estimates

Chart 21: China's saving by sectors



Source: CEIC, UBS estimates

Along with these structural changes, interest rate liberalization should lead to a gradual increase in overall interest rates and better capital allocation. Of course, further reforms on SOEs' corporate governance would also need to be carried out, to increase the price elasticity of their credit demand and increase their ability to withstand rising interest costs.

V. Foreign exchange inflows, capital controls, exchange rate and sterilization

- ***China's fixed exchange rate and large trade surpluses have led to historically unprecedented FX inflows, forcing the PBC to undertake sizeable domestic sterilization operations.***
- ***China has largely managed monetary policy independence so far with the help of capital controls and sterilization, but this is likely to become increasingly difficult.***
- ***Sterilization can continue for a while, but not without costs. The biggest risk is not sterilizing enough, leaving monetary policy too loose and risks under-priced - leading to higher inflation and an asset bubble.***

Can China have a peg and an independent monetary policy?

One of the most debated and confusing aspects of China's monetary policy is the role of FX reserve accumulation, exchange rate, and sterilization. Does China have monetary policy independence under the current exchange rate regime? Is monetary too loose because of large capital inflows? Is large-scale sterilization imposing costs on the economy? And does renminbi exchange rate undervaluation effectively doom China to overheated growth, high inflation and asset bubbles?

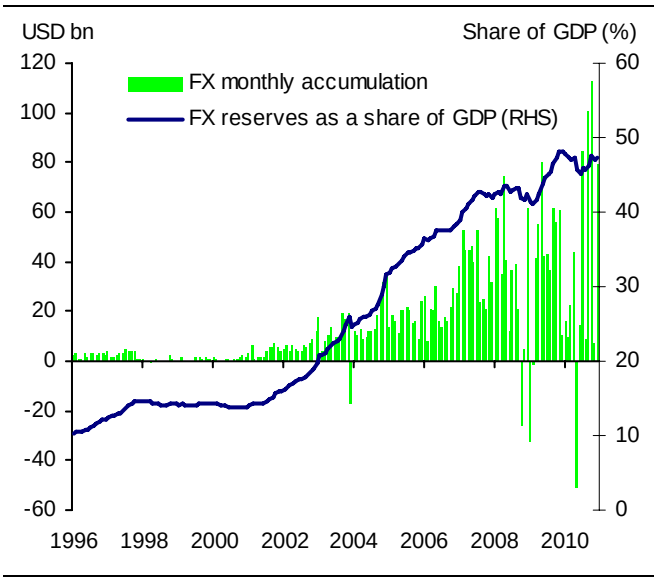
Our answers are as follows.

The exchange rate and domestic monetary policy

A fixed exchange rate means the PBC is the end buyer/seller of FX. Over the past eight years, China's surpluses have soared

While China officially has a managed floating exchange rate system, in practice the renminbi exchange rate has often been quasi-fixed. Over the past eight years, because of the large balance of payment surplus, the PBC has been buying large amounts of foreign exchange, soaking up the excess dollar to keep the RMB from appreciating much. As a result, China's FX reserves have ballooned to 48% of GDP at end 2010 (Chart 22).

Chart 22: Net official FX accumulation in China



Source: CEIC, UBS estimates

The huge and persistent FX purchase by the PBC naturally raises concerns. When central banks are buying excess FX balances from the market, they are selling domestic currency – increasing money supply, as we discussed above in section III. If the external surplus is high, this can mean a very large, even uncontrollable increase in domestic liquidity through FX intervention, which would in turn fuel high growth and inflation.

And FX inflows are now a big source of concern for economic management. When the PBC buys foreign exchange, it "prints" domestic money

Of course, looking at the data over the past decade, including the inflation performance, China has not lost control of monetary policy. The reasons are capital controls and sterilization.

So why hasn't base money liquidity soared along with FX reserves?

How effective are China's capital controls?

In our view, a key macroeconomic buffer that keeps monetary policy independent is China's relatively closed capital account. This is a hotly debated issue – many believe that China's capital controls are ineffective, citing numerous anecdotes of speculative money inflows and blaming the ups and down in China's asset prices to "hot money" movements. The concerns about "hot money" inflows have often led many in the policy making circles to argue against monetary tightening, especially interest rate hikes.

There are many anecdotes and concerns about "hot money" inflows

Indeed, the "impossible trinity" of international economic theory says that a small open economy cannot fix its exchange rate, domestic interest rates and domestic money supply all at the same time. If the central bank attempts to sterilize capital inflows, the rising interest rates could cause more inflows and exacerbate the issue.

The impossible trinity

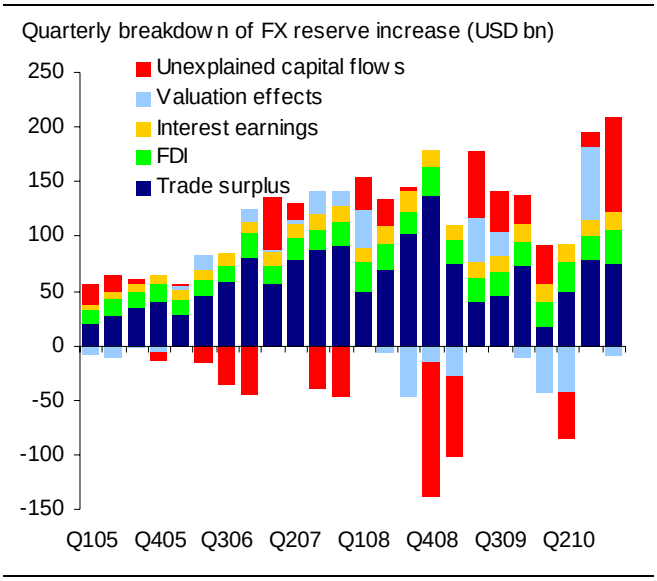
However, China is not a small economy, and, more importantly, China does not have free portfolio capital flows. The official capital account is still relatively closed, limited to foreign direct investment and a small range of borrowing, lending and asset transactions. The domestic bond market is relatively small and closed to foreign investors, while foreign participation in the equity market is conducted under the Qualified Foreign Institutional Investor (QFII) scheme, which has so far only a total quota of US$20 billion. The conditions for moving large amount of capital in and out of its equity and bond markets rapidly in response to interest rate moves are simply not there.

China is not a small open economy, but a large economy with a relatively closed capital account

In reality, we estimate that the bulk of China's FX accumulation since 2005 came from current account surplus and foreign direct investment, not "hot money" flows (Chart 23). Normally, "hot money" refers to portfolio capital flows, and we estimate "other capital flows" by taking FX reserve growth and subtract from it trade surplus, investment income, foreign direct investment, and exchange rate valuation changes. This is not a perfect measure of portfolio capital movements, and has included some other legitimate non-portfolio flows, but may have also under-estimated capital flows disguised as trade transactions in the current account.

And capital controls are largely effective – the bulk of China's FX reserve increase came from current account surplus

Chart 23: Breakdown of FX reserve accumulation

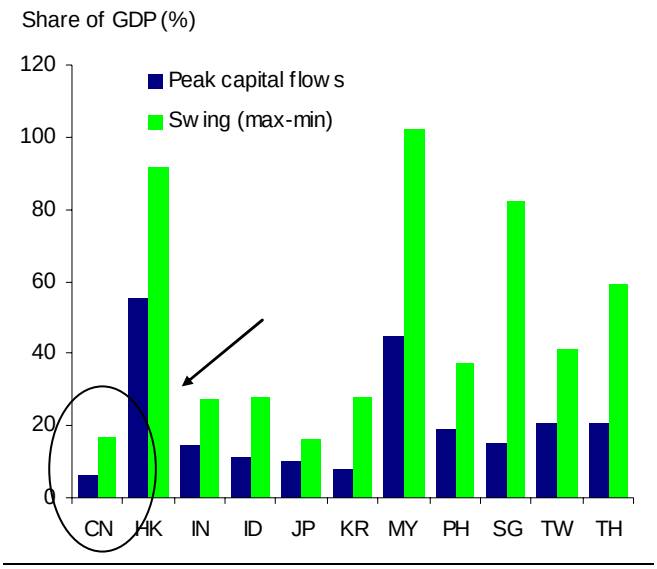


Source: CEIC, UBS estimates

Chart 23 also shows that "other capital flows" have been volatile, indicating that China's capital controls are by no means water tight. Comparing with other Asian countries, we find that China's capital flows as a share of GDP are similar to large economies with more open capital accounts like India, Indonesia, Japan or Korea (Chart 24).[3] Although China has a "closed" capital account, it still has sizable informal capital inflows because its fully open current account and very liberal FDI regime make it easy to disguise informal "hot" money flows.

China's informal capital flows are sizeable, as a fully open current account and liberal FDI regime make "informal" capital flows easier

Chart 24: Portfolio flows in regional perspective



Source: CEIC, UBS estimates

[3] Chart 24 shows two sets of data: first, the peak capital inflow or outflow for each country as a share of GDP over the past two decades (using the same definition as for China above), and second, the maximum peak-to-trough swing as a share of GDP for the same period.

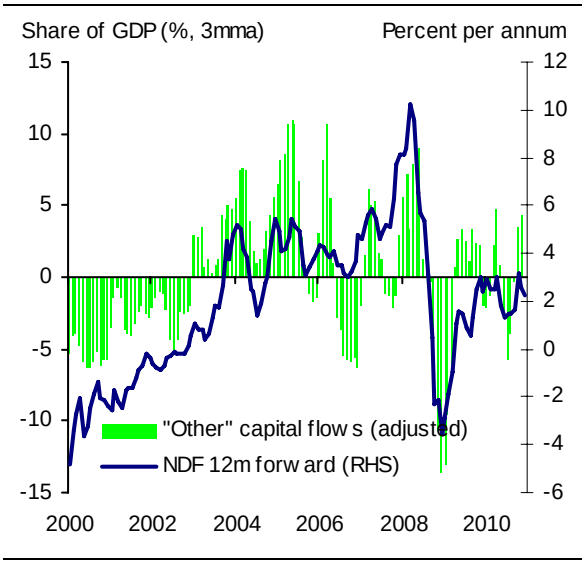
However, capital flows in China are clearly much smaller than in small economies such as Hong Kong and Singapore, which do not have much monetary independence. Also, it is it's not enough to look at the historical volume of flows. What we really want to know is how responsive are portfolio flows to changes in interest rates and exchange rate expectations? It is this marginal responsiveness that determines whether the PBC has functional independence in running domestic monetary policy.

But China's capital flows are smaller than in small Asian economies, and we really want to know whether controls are binding at the margin

Past data show that there is a visible historical relationship between the volume and direction of capital flows and expected RMB appreciation (as measured by the premium/discount on the RMB/USD in the offshore non-deliverable forward, or NDF market), as shown in Chart 25. However, the link between capital flows and the differential between local RMB interest rates and offshore US dollar rates is less convincing (Chart 26).

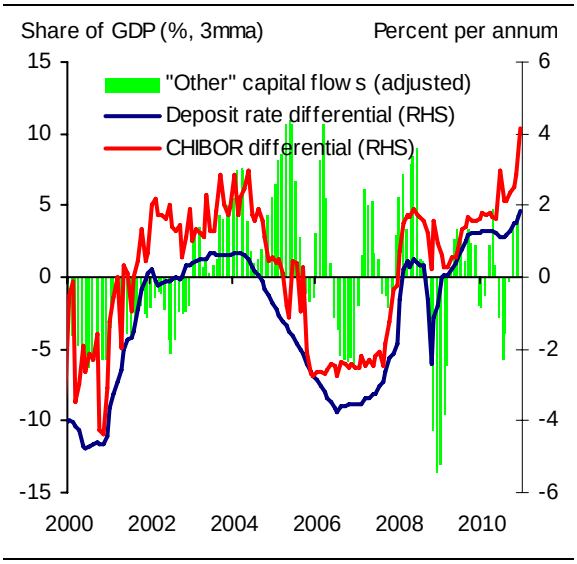
There is a positive relationship between capital flows and renminbi forwards, and interest rate differentials

Chart 25: What drives capital flows? (1)



Source: CEIC, UBS estimates

Chart 26: What drives capital flows? (2)



Source: CEIC, UBS estimates

If capital controls are not binding, then domestic interest rates should be exactly equal to US dollar rates (since any significant deviation would immediately be arbitraged away) in a fixed exchange rate setting. The further we move away from this situation, the lower the correlation between domestic and overseas interest rate movements.

Thus, the best way is to test arbitrage conditions

With this in mind, we follow Ma and McCauley (2007) in testing arbitrage conditions on two fronts. Chart 27 shows the relationship between Chinese domestic one-year interest rates and the implied one-year RMB yield in the NDF market, and Chart 28 shows the uncovered relationship between onshore RMB and offshore US dollar three-month rates.[4]

We test arbitrage conditions in two fronts

[4] The NDF premium/discount on the RMB defines the forward exchange rate against the dollar; the amount of expected RMB appreciation is in turn is by definition equal to the difference between US dollar interest rates and an "implied" RMB interest rate for the period in question. We use the one-year NDF forward rate and the one-year US dollar LIBOR rate to derive the implied RMB one-year yield in the chart.

In both cases arbitrage fails to hold

There is no visible correlation at all between onshore and offshore interest rates in either case. This could mean that portfolio capital flows are not responsive at all to changes in relative interest rates, or that capital flows do react to interest differentials but are too small relative to the size of the economy to have any impact on domestic liquidity conditions.

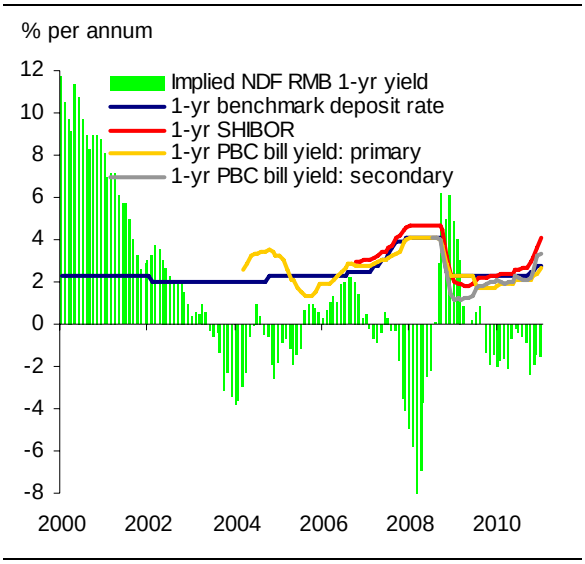
There is evidence for correlations between asset market returns and capital inflows

There is a good case that informal capital doesn't respond to interest rates or the currency at all, but rather to asset market returns. There is a lot of anecdotal evidence from banks and firms, which clearly points to property and equities as the main investment destinations for "hot" money. However, there is a crucial difference between capital inflows attracted by thousands of basis points in monthly asset returns and those by moderate interest rate differentials and exchange rate expectations.

As far as money markets are concerned, capital controls are binding

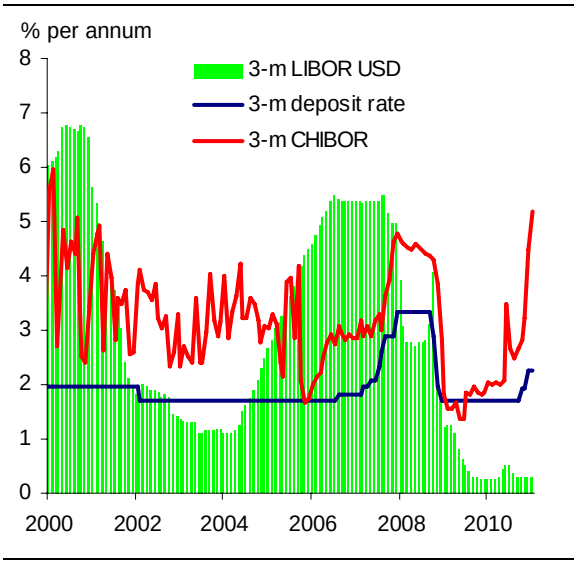
Our bottom-line conclusion is that as far as money markets are concerned capital controls are effectively binding – and thus that Chinese monetary policy is still basically independent.

Chart 27: Implied NDF differentials



Source: CEIC, UBS estimates

Chart 28: Uncovered differentials



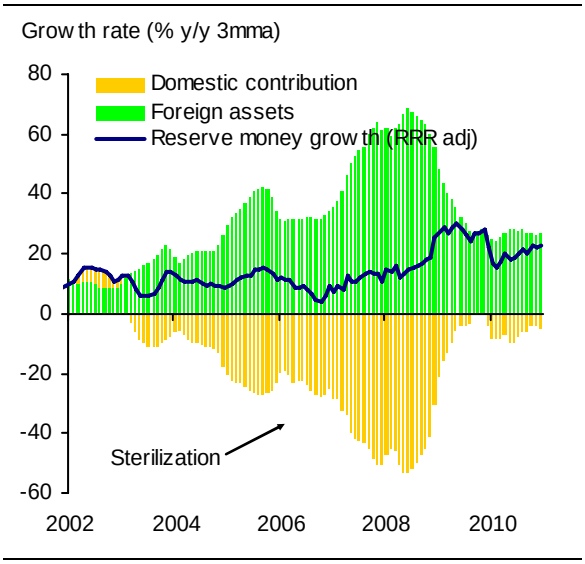
Source: CEIC, UBS estimates

Sterilization: size, costs, and duration

The PBC has sterilized a large portion of FX inflows before the crisis. Currently it is sterilizing about 25% of the inflows

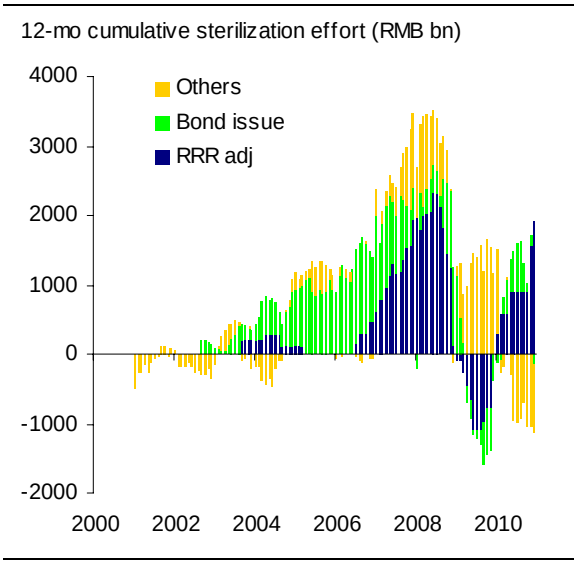
As we have discussed in section III above, the PBC has been engaged in large-scale sterilization of FX inflows over the past few years to manage base money growth (Chart 29). Before the crisis, the PBC sterilized an average of 70% of FX inflows by issuing central bank bills or raising RRRs (Chart 30). Between late 2008 and late 2009, the PBC stopped sterilization to leave ample liquidity in the banking system for credit expansion. Since early 2010, however, the PBC has restarted its sterilization operations, including by hiking the RRR 7 times, although it has cut down on net new issuance of central bank bills. In all, the PBC has sterilized less than before the crisis.

Chart 29: Base money growth by component



Source: CEIC, UBS estimates

Chart 30: Sterilization operations



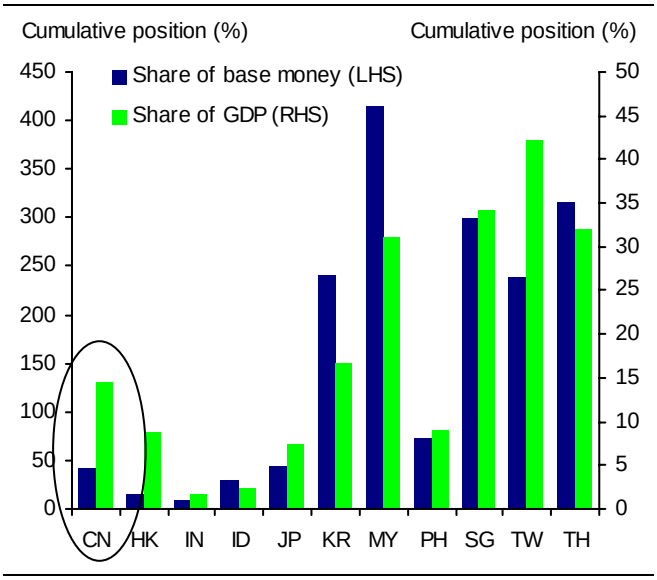
Source: CEIC, UBS estimates

So far the sterilization operations, together with the binding capital controls, have helped the PBC to be largely successful in managing domestic money supply even in the face of large foreign inflows. But how long can the sterilization game last? Aren't there costs associated with it?

The size of China's sterilization is not unseen in other Asian economies

To compare China's sterilization operations with those other regional economies, Chart 31 shows the cumulative stock of outstanding sterilization instruments (defined as the cumulative difference between FX reserve flows and base money growth since 2000) by country in Asia. This shows that China's sterilization operations are still smaller in comparison with some smaller regional economies with much more open capital markets. This should help to put China's situation into perspective when we discuss the problems associated with sterilization.

Chart 31: Cumulative sterilization in Asia



Source: CEIC, UBS estimates

Of course there are costs associated with sterilization and China can't do this forever without running into problems. The costs mainly lie in three parts: the interest cost to the central bank; the cost to commercial banks; and the cost to the economy.

But there are costs associated with sterilization to the PBC, the banks, and the economy

Interest costs to the central bank. When a central bank buys foreign exchange and prints domestic currency, it earns interest from its foreign asset holdings (US treasuries, for example). Subsequently, when the central bank sterilizes the domestic liquidity impact by issuing central bank bills, it has to pay interest to the commercial banks which buy them. If domestic short-term rates rise above average overseas rates, then a central bank engaging in sizeable sterilization operations can run significant net losses, and maybe forced to give up FX intervention altogether and let the exchange rate appreciate, or tighten capital controls further.

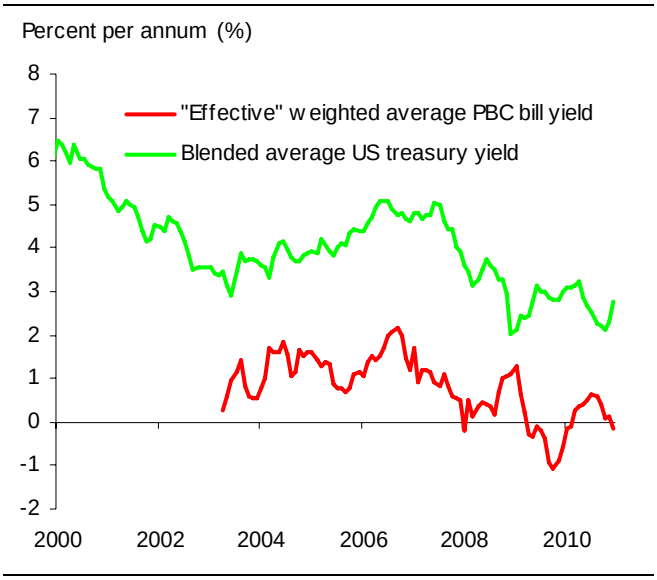
Sterilization offsets interest-bearing assets with interest-bearing liabilities

And the key is whether central banks are making or losing money

In the case of China, the PBC has not had to deal with large sterilization losses yet. A key reason is that the PBC has sterilized less than the full amount (Chart 29). Also, the PBC has increasingly used required reserve ratios to do the work – forcing commercial banks to share the burden of sterilization costs. Remuneration on required reserves is now 1.6 percent, lower than the 1-year CB rate of 2.7. As a result, the "effective" interest cost of sterilizing (using central bank bills) when calculated against a full dollar of inflows is well below the nominal one-year yield on PBC debt. Chart 32 shows our estimate for the average interest yield on US treasuries and the "effective" sterilization cost.[5]

So far the PBC has never had to worry about onshore costs – it sterilizes less than 100%, and uses RRR to force burden sharing by commercial banks. The "effective" interest cost is far below the nominal borrowing rate

Chart 32: Chinese vs. offshore interest rates



Source: CEIC, UBS estimates

[5]We use US treasuries as a proxy for China's official FX reserve holdings, though they are probably less than 60% of the total. The maturity weights are assumed to be 67% 10-year yields and 33% 3-month rates.

Even if domestic rates were to rise considerably above world levels, with roughly US$3tn in FX reserves compared to only US$500 billion in outstanding sterilization debt the PBC could afford to absorb marginal net interest losses for a while.

Even if domestic rates go up, the PBC could go on

Cost to commercial banks. Of course, using RRR hikes shifts part of the costs of sterilization onto the commercial banking system. The remuneration on new required reserves is lower than the interest rate paid to central bank bills, and may even be lower than interest paid to new deposits. We estimate that sterilizing with 10 percentage points of RRRs instead of central bank bills cost banks at least RMB 35 billion a year in interest income. The interest loss lowers banks' gross margins on their assets. However, the main impact is on the opportunity cost – otherwise banks would have been able to lend out against those new deposit funds.

Using RRR for sterilization shifts part of the costs to commercial banks

There is also a separate issue of the distributional effects of the reserve requirement "tax". Reserve requirements affect all banks in the economy equally even if individual circumstances are very different. This will force many banks to borrow liquidity from the banks with excess reserves. Short-term money market interest rates do spike up dramatically in China, in line with the timing of reserve ratio increases, though they usually go back down quickly. More recently, the PBC has announced that it will use differentiated RRR to mop up liquidity while limiting the blunt impact on smaller banks.

The effect on individual banks can be more substantial

Chinese banks on average have to put aside 18.5% of their deposits with the central bank. How much higher can RRR be? And when is ratio "too high"?

Is there an upper limit on the required reserve ratio?

International comparisons are not very useful. In developed economies, where central banks depend on interest rates as their money management tool, reserve requirements are used for prudential reasons only and tend to be set at very low levels. In emerging markets, they are also used for macro economic purposes. During periods of high inflows in the 1980s and 1990s, marginal reserve requirements in Korea rose from 5% to 30% at various points. When Latin American nations were fighting external inflows in the 1980s, marginal requirements ranged from 20% to *100%*.

Emerging markets have sometimes imposed very high requirements

In the case of China, as long as external surplus persists and FX reserves continue to rise rapidly, the PBC could set aside a bigger and bigger "pool" of liquidity in the form of required reserves and the RRRs could easily go above 20% without strong undue impact on the banking system as a whole (although this is not necessarily true for individual banks). Here, increasing reserve requirements is like being on a treadmill, stepping forward continually just to remain in one place.

The more the FX flows in, the bigger the "pool" of liquidity could be set aside, with no clear "maximum" level

Of course, it's also clear that the PBC can't rely on reserve requirements forever. The current impact on commercial bank profitability may be small – and vastly outweighed by strong lending-led profits – but the costs are real nonetheless, and a policy of *ad infinitum* ratio increases would eventually threaten banks' income and their ability to operate. This is all the more true given our view that commercial banks will begin to see growth and profits squeezed over the medium-term through other factors.

On the other hand, the PBC can't keep hiking reserves ***ad infinitum***

Cost to the economy. Finally, there are other costs of large and persistent sterilization. They include: the concerns about sterilization costs may delay necessary monetary tightening and interest rate hikes; the less-than-optimal base money management in the face of large inflows leaves the banking system awash with liquidity, and the resulting reliance on administrative credit controls means credit rationing and raises the risk of resource mis-allocation; requiring banks to share the sterilization costs also weakens the government's position in pushing interest rate liberalization. In all, the ongoing sterilization delays further necessary structural changes that could be facilitated by a faster RMB appreciation.

There are other costs to the economy

In our view, the PBC's "exit strategy" from reliance on required reserve hikes will involve a combination of three factors: First, a gradual decline in the magnitude of China's external balance of payments surplus, which in turn will depend on the government's willingness to push up the pace of RMB appreciation and change the growth model. Second, a push for capital outflows to reduce FX accumulation. And third, a switch to yet other sterilization instruments – long term government bonds, for example.

The exit strategy will involve bringing the trade surplus down, increasing capital outflows, and switch to other alternatives of sterilization

RMB appreciation and PBC "negative equity"

After years of large-scale and sterilized FX purchase, the PBC has accumulated RMB 21.5 trillion in foreign assets, out of a total asset of 26 trillion at end 2010. In contrast, its liability is almost all in RMB, and its statutory capital is only RMB22 billion. There is another RMB 799 billion in "other items", which is where the PBC records cumulative operating profits and losses.

The PBC has accumulated huge FX assets while its liabilities are in RMB

What would happen if the RMB were to suddenly appreciate by 10% against its reserve-weighted basket of currencies?

The value of net foreign assets would immediately fall by more than RMB 2 trillion in RMB terms – i.e., enough to wipe out the entire stock of accumulated net PBC profits as well as its statutory capital.

At present, a 10% real revaluation could wipe out current PBC equity capital

This of course would also mean stopping profit remittances to the budget, and probably for a long time. However, the cost to the fiscal authority would not be new, but merely a realization of the losses that have been accumulating when the PBC engaged in sterilized FX purchase to keep the RMB from appreciating to promote economic growth.

There will be a cost to the fiscal authority

However, having a negative equity does not mean much for the PBC in terms of its monetary policy management.

However, this doesn't mean much for monetary policy

The first reason, from a pure accounting perspective, is that the PBC doesn't actually adjust its statutory capital position for profits or losses. If RMB appreciation were to result in a valuation loss, this would be recorded in the "other items" category – which has actually been negative in the past and could easily be negative again – leaving statutory capital unchanged. In countries where central banks have written down statutory capital and turned to fiscal authorities for a new capital injection, there was a potential loss of independence. For the PBC, which doesn't have formal policy independence in the first place, this is not really an issue.

The PBC doesn't record valuation losses against statutory capital, and is also not threatened by a loss of political independence

More fundamentally, net equity doesn't really "matter" for central banks

Much more importantly, negative net equity doesn't necessarily have implications for actual monetary policy, since unlike commercial entities central banks are not legally required to "repay" their liabilities. In a modern fiat banking system domestic base money is simply a claim on the central bank itself, not backed by any other physical or financial asset; and other liabilities such as central bank bills are an eventual claim on base money. Even central banks' "net worth" is nothing more than an accounting entry denominated in domestic base money, i.e., a claim on the central bank itself. This means that from a purely macroeconomic point of view, there's no necessary reason for central banks to have positive rather than negative equity capital.

The real key is the difference between stock losses and flow losses

The real issue here is a question of "stocks" vs. "flows": in economic practice there is a large distinction between a revaluation impact on the *level* of equity capital and *flow* losses on monetary operations. A central bank can have positive net worth today but still lose control of monetary policy if it is facing spiraling sterilization costs in the face of large external inflows. By the same token, if a central bank has positive net interest earnings then even a negative equity position today would eventually turn positive again over time, without affecting ability to set interest rates and other policy parameters in the meantime.

Many central banks have been happy to operate with negative net equity

Historically, the negative equity examples that required drastic policy adjustments and statutory recapitalization arose due to flow losses on monetary operations, either because of costly net sterilization or else pressure from the government to provide quasi-fiscal subsidies. By contrast, central banks that had large one-off write downs due to revaluation or other factors were generally fine to operate with negative equity for a period of time.[6]

China and Quantitative Easing (QE)

This helps explain why US Fed policies have very little impact on China

Analysis in this section should help deflate the pervasive myths about China and the US Fed. A common belief, fueled by the financial press, is that with a quasi-fixed exchange rate, China is effectively "importing" its monetary policy from the Federal Reserve, and, in recent months, importing QE2. In China, everything from high property prices to rising food prices have been blamed on QE2.

This may be true for a very small economy like Hong Kong, but our analysis has shown that this is not true for China, where binding capital controls, large sterilization operations, and direct credit controls can largely shield domestic liquidity conditions from US monetary policy. The huge credit expansion in 2009 and the most recent re-acceleration of credit growth have been due to domestic policy decisions and excess liquidity in the banking system, not because China has lost its monetary policy independence.

[6] For further information on central bank capital and experiences with negative net equity, see Dalton, J., and Dziobek, C. (2005): "Central Bank Losses and Experience in Selected Countries." *IMF Working Paper*, No. WP/05/72, April 2005, Stella, P. (1997): "Do Central Banks Need Capital?" *IMF Working Paper*, No. 97/83, July 1997, Stella, P. (2002): "Central Bank Financial Strength, Transparency, and Policy Credibility." *IMF Working Paper*, No. WP/02/137, August 2002.

VI. Liquidity, money supply, and asset prices

- ***With the recent rise in off-balance sheet lending, simply controlling banks' RMB lending is no longer sufficient to control overall bank credit.***
- ***When judging the overall liquidity conditions in the economy, we also need to consider self-financing, government funding, and fund raising in the capital market.***
- ***The high M2/GDP ratio reflects the dominance of the banking system and under-development of financial markets in China. The historical underweight position in financial assets increases the likelihood of asset bubbles.***
- ***This means that central bank monetary policy has limited impact on influencing asset prices, but rate hikes should help at the margin.***

Can China really control credit at all? What is the true credit picture?

Some observers claim that China can't control credit growth at all

In recent years some analysts have argued that China has no effective control over credit growth at all, due to the prevalent role of the informal "curbside" financial market (or the "shadow banking system"), or, more recently, the bank-trust cooperation that leave credit off banks' balance sheets.

China does have a very active curbside market serving smaller firms

Indeed China has an active informal lending market. As the state banks were mandated to finance state-owned enterprises, smaller and private companies were left to their own devices to fund growth, which meant either retained earnings, borrowing from family and friends, or turning to local moneylenders. And controls on deposit and lending interest rates in the commercial banking system meant that even as banks changed their focus to more market-based lending, smaller firms remained almost largely outside the system.

And curbside rates are much higher than official rates

In the curbside market, interest rates are set according to separate supply and demand trends, usually at a multiple of official rates. Data on the size of the curb market is patchy. Usually some domestic surveys studying one area extrapolate the information nationwide. Some claim the curb market is as large as 20-30% of the formal lending market.

However, we don't believe the informal market has played a key role

However, we don't believe the curbside market has played a significant role in financial cycles; i.e., in our view official credit policy tightening has generally been effective. We say this for the following reasons: (i) China's formal banking sector is about 200% of GDP in size, and it is impossible for the fragmented curb markets, which do not benefit from credit multiplier effects, to significantly offset the effect of credit tightening in the formal market; (ii) interest rates in the informal market skyrocket when credit tightening is in place in the formal banking system – a sign that the curb market cannot increase credit supply effectively.

Trust products and other credit from the formal banking system are bigger concerns

In the past two years, the sharp increase in base money supply, low interest rates, and the re-emergence of credit quota as a main policy tool have led to a rapid increase in other forms of bank credit. The biggest is off-balance sheet credit from the formal banking sector. Here we are mainly talking about bank "trust products" – (usually) short-term products that banks sell to their retail depositors with the underlying assets being loans that banks sell to trust companies. Banks

earn a lower interest margin on these products, but do not have to occupy their capital with provisions that are required for standard bank loans, as the trusts are booked as off-balance sheet. In addition, as the deposits are also moved to "off balance sheet", banks do not have to pay required reserves on these.

Bank trust loans increased by an estimated RMB 2 trillion in 2010, despite CBRC rules

The amount of bank trust products grew rapidly in late 2007, when serious credit tightening was put in place, and really took off during 2010 when banks tried to bypass the strict loan quota. According to Fitch and other industry resources, outstanding trust products stood at more than RMB 3 trillion at end November 2010, up from about 1 trillion at end 2009, despite the attempts of the China Banking Regulatory Commission (CBRC) to clamp down on the practice in mid 2010.[7]

Two other forms of bank credit also grew rapidly in the past two years: FX loans and medium-term notes

In addition, two other types of credit also grew rapidly in the past couple of years: medium-term notes and foreign currency lending. Medium-term notes are 3-5 year corporate notes that banks issue for their corporate customers and are traded in the interbank market. They are effectively medium term loans. Foreign currency lending grew by 56% in 2009 (to about 2.6 trillion RMB) and 35%+ in H1 2010, as it is not subject to the lending quota, charges lower interest rates, and the RMB is expected to appreciate. FX lending has slowed significantly in H2 2010 on tighter rules.

Overall bank credit grew more rapidly than meets the eye…

When we include trust loans, FX lending, and medium term notes together with RMB lending, then bank sector credit creation was 11.6 trillion in 2009 and 10.9 trillion in 2010 (Table 6). On this meter, total banking sector credit grew by 25% in 2010, as compared to 36% in 2009, both faster than the RMB loans (32% and 20%, respectively). The slowdown in credit growth in 2010 was not nearly as sharp as indicated by the RMB lending number alone.

Table 6: Total new bank credit (RMB bn)

	Total	Loans (RMB&FX)		Medium term notes	Trust*
			RMB loans		
2002	1,923	1,923	1,800	0	0
2003	2,994	2,994	2,770	0	0
2004	2,407	2,407	2,260	0	0
2005	2,462	2,462	2,350	0	0
2006	3,269	3,269	3,180	0	0
2007	4,121	3,921	3,630	0	200
2008	5,559	4,985	4,911	174	400
2009	11,614	10,523	9,590	691	400
2010	10,911	8,357	7,950	494	2,060

Source: CEIC, Fitch, Wind, UBS estimates

*Note: Trust includes CWMP (credit-backed wealth management products) and CTP (credit-equivalent trust products). Data come from Fitch's estimates.

[7] In January 2011, CBRC said that a total of 1.67 trillion of trust loans need to be brought onto the balance sheets by end 2011. The differences between these numbers are not clear.

This shows that with liquidity being abundant and interest rates low, administrative credit controls are gradually losing their effectiveness. First, in 2009 and much of 2010, since most of the FX inflows were not sterilized and base money supply increased sharply, banks had ample liquidity to engage in credit expansion. When the government tried to use credit quota to control bank lending, banks searched for innovative ways to profit from the excess liquidity. Second, with rising required reserve ratios on deposits, banks also have incentives to channel some of the would-be deposits into trust products so they are not "frozen" at the central bank.

...because banks had the funds and wanted to make money, eroding the effectiveness of credit controls

Overall liquidity in the economy

The dominance of commercial bank lending in China's financial system is why the government has focused on targeting bank lending in monetary policy, but this practice has also caused quite some confusion about the true size of financing in the economy. That the overall liquidity in the economy is more than just bank credit should be obvious, but there are always question on whether a certain amount of new bank lending would be sufficient to finance the larger fixed investment, and whether one should worry about a collapse of investment growth as a result.

Bank credit and overall financing are two concepts

Indeed the PBC has started to monitor a broader "overall social financing" for non-financial institutions. For this, the PBC includes both RMB and FX lending, as well as fund raising from the corporate bond market and stock market. According to this classification, PBC estimate that overall outside financing for non-financial companies totaled 12.3 trillion in 2009, and about 10.5 trillion in 2010 (Table 7). They did not include the off-balance sheet lending such as the trust loans.

The PBC includes fund raising from capital market in its overall social financing, but omits the off-balance sheet lending

Table 7: Non-financial corporate sector financing

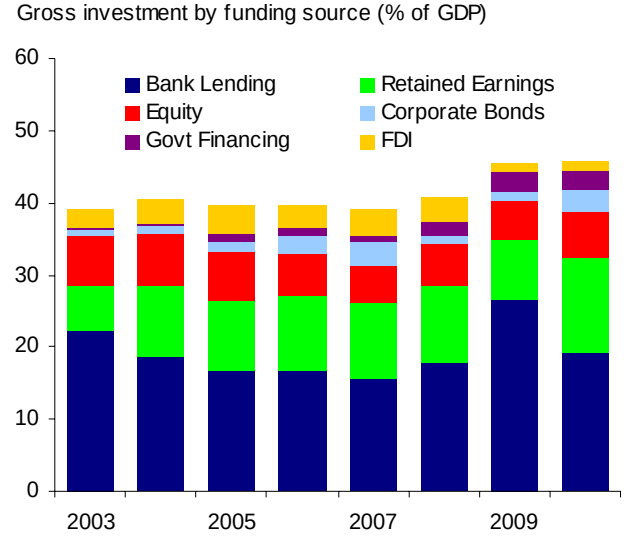
	Total	Loans (RMB&FX)	Stocks	Corporate bonds
	RMB bn	RMB bn	RMB bn	RMB bn
2002	2,052	1,923	96	33
2003	3,163	2,994	136	34
2004	2,590	2,407	150	33
2005	2,768	2,462	105	201
2006	3,720	3,269	225	227
2007	4,803	3,921	653	229
2008	5,946	4,985	353	608
2009	12,150	10,523	390	1,237
2010	10,140	8,357	612	1,171

Source: CEIC, PBC, UBS estimates

While the PBC overall financing captures more than just bank lending, it is still not broad enough if we want to measure overall liquidity or financing for non-financial companies in the economy (we are not talking about liquidity for the equity market or money market here). For that, we have to look at all major sources of financing at the firm level – the main missing parts are firms' retained earnings, government's investment spending, and foreign direct investment. We have been monitoring this broad concept of investment financing as a proxy for overall liquidity in the economy (Chart 33).

We think self-financing at the company level and government funding should also be included when judging overall liquidity conditions in the economy

Chart 33: Sources of funding for gross fixed investment



Source: CEIC, PBC, Wind, UBS estimates

By looking at all major sources of financing in the economy, we were able to conclude that a significant increase in bank lending was going to drive growth in China in 2009 (see *"How Will China Grow? Part 1: The Re-leveraging of China"*, 9 December 2008), and that a sharply lower amount of new bank lending in 2010 was nevertheless sufficient to support robust growth (see *"The Recovery is Strong, Now the Complications – Looking beyond 2009 (Transcript)"*, 29 October 2009).

Looking at the evolution of various sources of funding, it is clear that between 2003 and 2007 retained earnings grew rapidly while the importance of bank lending shrank. At the onset of the global financial crisis, the sharp rise in bank lending (along with increased government spending) offset the collapse of corporate earnings and the dry-up of capital market activity. This offsetting effect is the key reason why China was able to keep growth going, and why the lending surge was not inflationary.

With strong growth in retained earning, the need for bank lending could be reduced

Implications for policy makers

While bank lending remains the most important source of outside financing, there are other important components to overall liquidity and financing in the economy. Policy makers need to also monitor the development of corporate earnings, foreign investment, as well as capital market fund raising.

Policy makers cannot just focus on controlling banks' RMB lending

Given that the relationship between bank lending and GDP (investment) growth is not linear or fixed, and other components of financing are hard to forecast, one can not simply use a fixed coefficient between nominal GDP growth and credit growth to derive a lending growth target each year.

The traditional rule of thumb link between GDP growth and lending growth may be losing validity

In an environment of low interest rates and abundant liquidity, policy makers can not rely on administrative lending quotas alone to keep bank lending growth in check. Policy makers need to move to more market-based and flexible policy tools to manage credit and overall liquidity in the economy. Having prices—that is, interest rates—right can go a long way in this regard. Tightening base money liquidity and raising interest rates are necessary, as is tightening rules on other forms of bank credit.

Currently, tighten base money liquidity and raising interest rates are necessary to tighten overall liquidity

What about the large size of M2?

A related note about overall liquidity in the economy concerns the behavior of broader money aggregates M2 in China.

Many have expressed concerns about the high M2/GDP ratio and the implication for inflation in the future. First, China's high M2/GDP ratio does not necessarily mean that China has a large excess liquidity overhang destined to result in high inflation. China's M2/GDP ratio, at about 200%, is probably the highest among major economies. The reason is related to the large role of banks discussed in Chapter II. More than half of private wealth exists in the form of bank deposits in China – a reflection of the fact that financial markets are relatively less developed. In addition, M2 is further boosted by high corporate deposits, due to the lack of a large bond market, difficulties for private companies to access bank credit, and the lack of alternative destination for corporate excess funds. These reasons make international comparisons of M2/GDP ratios not very meaningful.

China has a very high M2/GDP ratio, as banks dominate the financial system and more than half of private wealth exists as bank deposits

Second, although the PBC targets the growth of broad money, M2, it does not have direct control of broad money – largely deposits of household and corporate sectors. The PBC can indirectly influence M2 by managing base money supply and trying to control bank lending. However, it can do little to control households' preference to store wealth in one form or another. It is the M2 liquidity and future shifts of deposits that will drive asset prices in the future.

The PBC can only indirectly influence M2 growth

Monetary policy and asset prices

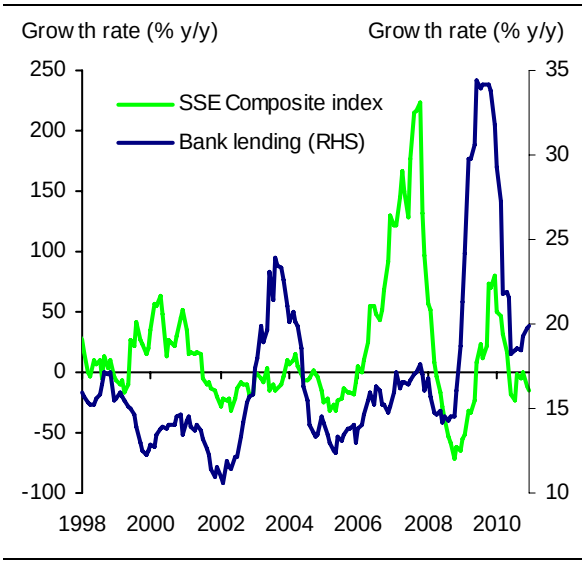
The most common view in the financial markets is that Chinese stock prices are driven by monetary policy and FX liquidity flows, and low or negative real deposit rates.

Many investors believe monetary policy drives stock prices

However, we do not find these arguments compelling when examining the evidence. Chart 34 shows that the credit cycles have not often lead the equity market cycle. Chart 35 shows that even the gross amount of FX reserve inflows accounts for only a tiny portion of the overall pickup in transaction volumes in the equity market or, for that matter, estimated domestic retail inflows.

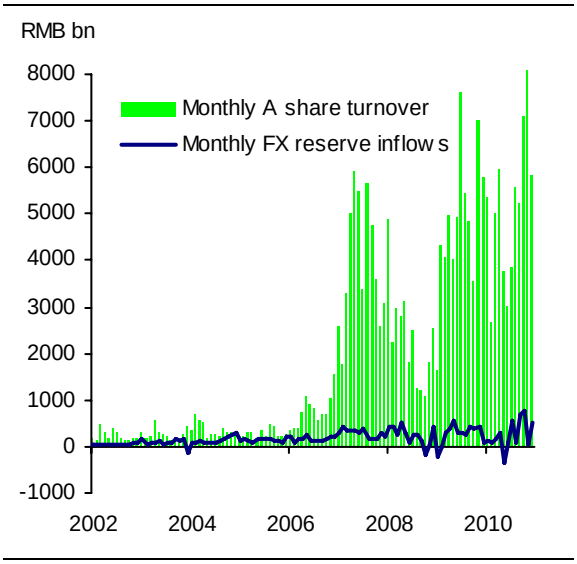
However, we don't think their arguments are compelling

Chart 34: Credit growth and A-share prices



Source: CEIC, UBS estimates

Chart 35: FX flow not a big influence



Source: CEIC, UBS estimates

If we just focus on indicators of domestic liquidity growth and monetary policy, the rally in 2009 seems obvious but the boom in 2006 was not. If anything, the A share market should have run in 2000-01, when excess reserves in the banking system were at their peak ... or 2002, when both base and broad money were expanding rapidly.

Based on monetary policy, the market should have boomed earlier, not in 2006

Nor do low or even negative deposit returns necessarily tell the whole story. Of course, there's little doubt that real deposit rates have been trending downwards since the late 1990s as underlying inflation has increased. And this environment almost certainly contributed to the buoyancy of stock prices in recent years.

Nor do low real deposit returns tell the whole story

We think underlying drivers of the Chinese equity boom in 2006-07 were (i) the non-tradable share reform in 2005 that removed the biggest negative market sentiment; and (ii) the extraordinary historical underweight position in equities.

We believe the real reasons behind the 2006-07 boom were equity market reform and portfolio rebalancing

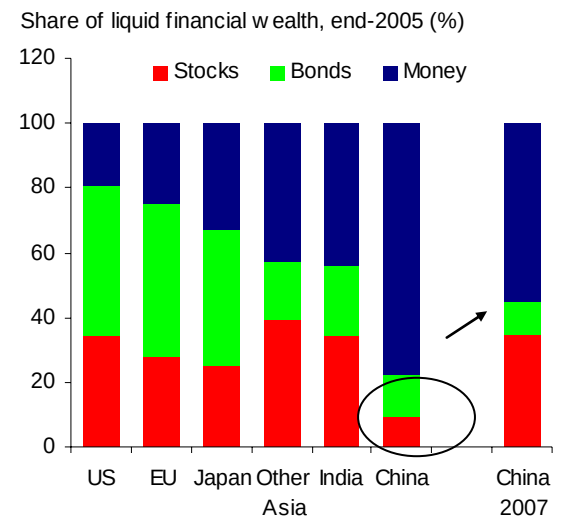
From 1999 to 2005, China's equity market was weighed down chiefly by various (unsuccessful) government plans to sell down non-tradable state shares into the market. In 2005 the authorities firstly adopted a "market-friendly" solution, reimbursing minority shareholders for the estimated losses involved in selling down state shares. The biggest sources of negative market sentiment for 5 years finally disappeared.

The 2005 non-tradable share reform removed the biggest source of negative sentiment in 5 years

In 2005, an extremely low share of China's financial wealth was in equities. Chart 36 shows the breakdown of liquid financial wealth across global economies as of end-2005. For regions like the US, EU and Japan, which have mature bond markets, total equity market capitalization usually accounts for 25% to 30% of total liquid financial assets; in non-Japan Asia, where bond markets are relatively underdeveloped, equities tend to play a stronger role at nearly 40% of financial wealth. China's equity market accounted for only *9%* of financial wealth, far below the regional average. Most of China's accumulated savings was simply locked up in the banking system, to a much greater degree than anywhere else in Asia.

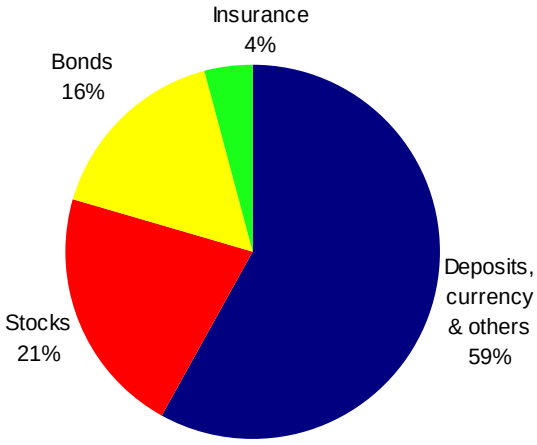
Equities normally account for 30% to 40% of financial wealth. In China, the number was 9% in 2005

Chart 36: The real story



Source: CEIC, UBS estimates

Chart 37: China financial wealth breakdown in 2010



Source: CEIC, UBS estimates

China's large historical underweight position helped fuel the sharp rally China's large historical underweight position helped to duel the sharp rally in 2006-07. After an eight-fold gain in total stock market capitalization from the 2005 trough, in September 2007, domestic equity holdings accounted for 35% of financial wealth in China (the far right bar in the Chart), catching up with the regional average. Chart 37 shows the current breakdown.

China's large historical underweight position helped fuel the sharp rally

Can the PBC influence asset prices?

The above analysis suggests that monetary policy has limited impact on influencing equity prices.

The PBC has a comparably easy time controlling credit growth – tighten base money supply and using direct credit control. But the equity inflows are not really financed by *new* credit growth but rather by portfolio reallocation from the existing stock of financial assets, and one of the most surprising and salient facets of the Chinese equity market is the lack of leverage or gearing in the system.

The central bank can control credit growth, but equity flows are not financed by new credit

As we saw in Chart 37 above, with US$10.6 trillion still sitting in the banking system households and firms do not really needed to leverage up to buy shares; All they have to do is collectively attempt to shift their current portfolio composition. In this environment, the question of whether that US$10+ trillion sum increases or decreases by a few hundred billion dollars a year as a result of monetary policy decisions is really second-order.

And with US$11tn in banks, Chinese savers have a large reserve

The property market is another matter. There is leverage in the property market, even though leverage is relatively low – one needs to put down 20-40% (now 30-60%) upfront to purchase a home. Certainly, even in this market, the fact that households have most of their saving sitting as bank deposits and need to diversify is an important factor. However, the PBC can tighten liquidity and use sectoral lending controls to restrict credit flows into land and home purchase.

Property market is different, even though asset re-allocation matters here as well

What about interest rates?

Rate hikes would help to dampen flow of funds into asset market, at the margin

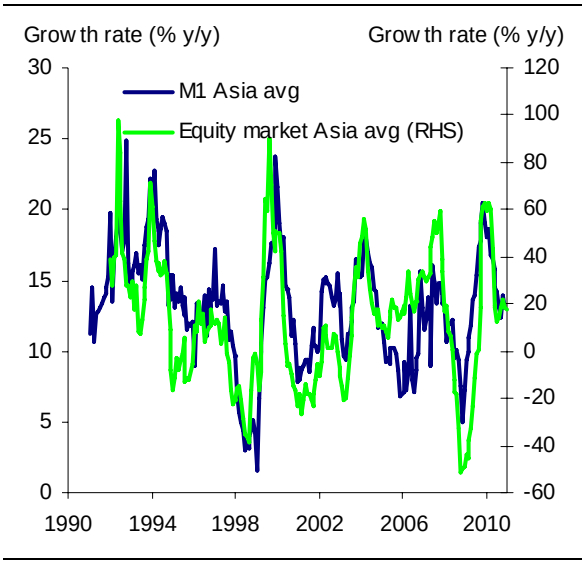
The PBC could of course raise interest rates – higher deposits rates would increase the return on monetary assets and slow the flow of funds into the equity market and property market; and higher lending rates would increase the cost of capital. The latter would also raise the opportunity costs for purchasing and holding land, and the rise in land prices has been an important factor driving property prices. However, given the low levels of interest rates, rate hikes would only work at the margin in the near term.

The M1 myth

Does M1 drive stock prices?

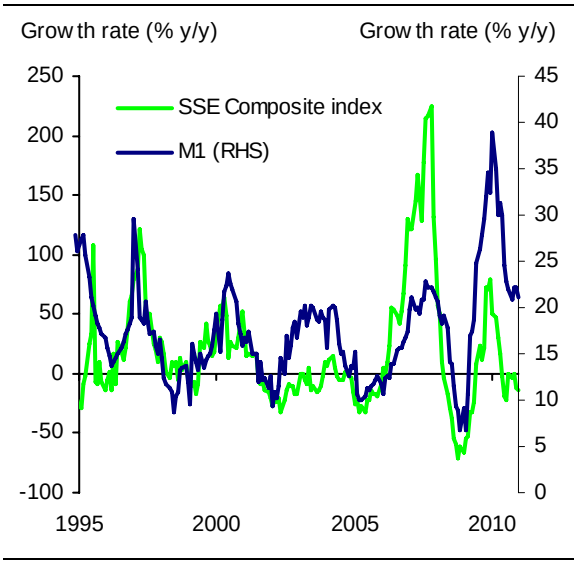
It is often argued that "narrow" money M1 shows a consistent, strong positive correlation with the equity market on a flow basis. As shown in Charts 38 and 39, the relationship between M1 growth and equity price growth is almost one-to-one in the Asian region as a whole, and very strong in China as well. Indeed, for many observers fluctuations in M1 are the most important barometer of financial market liquidity; surely this is an indication that loose monetary policy and excess liquidity growth are fundamentally responsible for the A share rally?

Chart 38: The Asian M1 myth



Source: CEIC, UBS estimates

Chart 39: The China M1 myth



Source: CEIC, UBS estimates

Our answer is no, and there are two fundamental reasons why the above statement is wrong.

No – M1 is driven by portfolio reallocation, not by policy

First, M1 may be a measure of monetary liquidity, but it's not a measure of liquidity *creation*. The only way for new money to be created in any economy is for the central bank to issue new base money, or for banks to lend out more against a given level of base money, thus increasing broad money M2. By contrast, narrow money simply measures one sub-category of overall monetary holdings by maturity – a sub-category that households and firms can move in and out of at will by adjusting portfolio allocation, without any necessary tie to broad monetary conditions. In theory, M1 can double overnight even when the central bank is in the middle of a draconian monetary tightening; it can also fall by half even when central bank is printing new money at full throttle.

And second, equity prices may be highly correlated with M1 movements for every country in Asia ... but as shown in the two charts above, the causality often runs in the opposite direction. That is, it's not M1 growth that drives the stock market, but rather the stock market that drives M1 growth.

And it's often the stock market that leads M1, not the other way around

Why? Think about the definition of narrow money, i.e., cash and demand deposits in the banking system. When asset returns are high relative to deposit interest rates, households and firms tend to shift out of long-term deposits and into cash or demand holdings in order to invest in the market. Analogously, when asset returns are low, investors move back into long-term deposits.

VII. The outlook and risks

- ***The global financial crisis may change the pace and sequence of future reforms in China's monetary management, even though the general direction arguably remains intact.***
- ***We expect continued reliance on administrative measures and a more cautious approach to financial market and interest rate liberalization, but see continued gradual capital account opening and a move flexible exchange rate in the next few years.***
- ***We do not share market fears of a runaway inflation or policy-induced hard landing in the next year or two, nor do we think a property market collapse is imminent.***
- ***We think the biggest risk to the policy outlook in the next few years is over-investment and accumulation of asset bubbles (especially in the property sector) fueled by abundant cheap liquidity.***

The outlook

The PBC has made great progress

Coming from a central-planned economy, the Chinese government and the PBC have made enormous progress in monetary management over the past 20 years. The economy, the financial system, the tools policy makers have at hand, the responsiveness of the economy to market-based measures, and experience of the policy makers themselves are very different today compared to 20 years ago. As a result, the authorities have done a pretty good job of keeping the economy under control in the recent cycles, and we don't see major near-term macro risks at present.

What about the future trend and risks?

How will China's monetary policy evolve over the next few years and what are the potential medium-term risks to the monetary environment?

The global financial crisis has had its impact...

The direction of future monetary policy management seemed very clear before, but the global financial crisis and the lessons from which may change the pace and sequence of future reforms, even if the general direction arguably remains intact.

What happened during the crisis and what lessons may have been drawn?

It nearly destroyed the "role model", unleashed cheap liquidity, and led to increased pressure for China to change

On the external side: (i) the breakout of the worst financial crisis post WWII in the US and advanced economies suggested that there were serious flaws and risk control issues in the most advanced financial system and monetary management in the world; and it became less clear what system China should model its monetary and financial system after; (ii) the crisis set forth a prolonged period of abundant liquidity and low interest rate in the world; and (iii) the crisis also led to intensified pressure for China to adjust its growth model and the exchange rate regime.

China's administrative measures worked wonders on growth, but not without costs

On the domestic front: (i) the government resorted to administrative measures to manage bank lending and the economy during the crisis, which proved to be highly successful in terms of a speedy recovery from the shocks; (ii) the PBC sharply reduced the net sterilization of FX inflows to leave abundant liquidity in the system with low interest rates, and the process of monetary normalization has proven to be long; (iii) the surge in bank credit in general, and lending to local government investment platforms in particular, planted the seeds of future non-performing loans, compromising the health of the banking system.

As a result, we expect (i) the continued reliance on quantitative instruments in monetary management with the use of administrative measures lasting for a while longer than envisaged before the crisis; (ii) a setback in commercial bank interest rate liberalization, as the government would be obligated to protect bank margins after asking banks to increase lending to support growth during the crisis; (iii) an active use of macro-prudential measures such as counter-cyclical capital adequacy requirements for banks to reduce macro risks to the banking system; and (iv) a more cautious approach to developing financial markets, especially with regard to asset-backed securitization, local government bonds, and derivatives market.

We expect a longer reliance on administrative measures, slower progress on interest rate liberalization and cautious approach to financial market development

On the other hand, we think the crisis has added the urgency and confidence for the Chinese government to push for capital account liberalization, especially with respect to outward investment. We also expect more policy measures to promote the use of RMB in international trade and finance, which should lead to the growth of foreign exchange market, both onshore and offshore. As for the exchange rate system, we expect the pace of change, both in terms of greater flexibility and in terms of appreciation, will resume to the pre-crisis level.

Capital account opening and greater exchange rate flexibility will continue

For China, moving to a more market-based approach to monetary management, and further, changing to using interest rates rather than quantitative measures, and further financial market liberalization will crucially depend on the following: Structural reforms that will significantly reduce state-control and influence in the economy and financial system, and will lower corporate saving rates; and the fading of large scale FX intervention and sterilization.

Progress depends on structural reforms and drop in external surplus

As financial market develops and financial portfolios diversify away bank deposits, we would also expect the current tendency toward asset price bubbles to fade.

What could go wrong?

The biggest macroeconomic concerns on China are rising inflation, local government debt and financial crisis, ever rising external surplus that result in the worsening of global imbalance, and last but not the least, a collapse of the property market. We think the biggest risk in the next few years is over-investment and accumulation of asset (property) bubbles that will eventually burst, resulting in excess capacity and non-performing loans.

The biggest risk is over-investment and accumulation of asset bubbles

Inflation. With the recent rise in inflation, most people are concerned that China is entering a high inflation era, with monetary expansion and wage pressures being the main drivers. People are worried that the PBC doesn't have effective control on credit and interest rates, and will have to make drastic policy adjustments in order to rein in a runaway economy.

Does China have runaway inflation?

However, as shown in Chart 40, the recent acceleration in CPI inflation has mostly come from food, with weather-sensitive vegetable prices leading the way. Non-food prices have grown more modestly, with utility price adjustments and cotton price surge as the biggest drivers. Assuming no unusual major natural disasters, we expect vegetable prices to moderate visibly after the cold winter months, and general food inflation to slow in the summer. We also expect the government to suspend utility price adjustment until this fall or even later, to

Recent CPI inflation has mainly come from food, and we expect inflation to moderate in H2

help bring down headline CPI inflation. Our forecast is that CPI will average at 4.8% in 2011, and about 4% in 2012.

We see little danger in wage-inflation spiral

Despite recent wage pressure, we find little evidence that this has led to higher core manufacturing goods prices. We think a well supplied manufacturing goods market, strong labor productivity growth in the sector (Chart 41), and the lack of collective wage bargaining should keep core inflation in check. While services prices may face stronger upward pressure, many prices are controlled by the government, including transport, utilities and medical services.

We think the government is unlikely to tighten monetary policy aggressively...

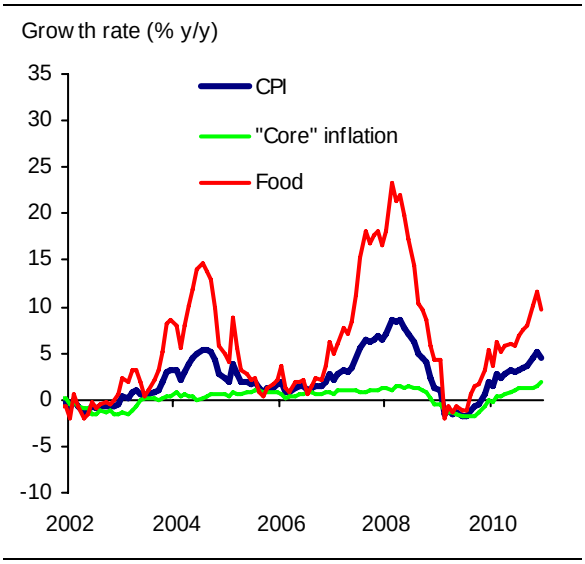
Why would the government not tighten monetary policy aggressively now? We think this is because: (i) most in the government believe inflation is driven by food prices and are not convinced that monetary policy could play an important role in curbing inflation; (ii) the government is still worried about the sustainability of external recovery, especially given the discussions of additional quantitative easing in the US and the ongoing European sovereign debt crisis.

...but at the margin

Of course, we do assume that the government will tighten monetary conditions at the margin and keep bank lending more or less under control, even if not quite sufficient and with a lag

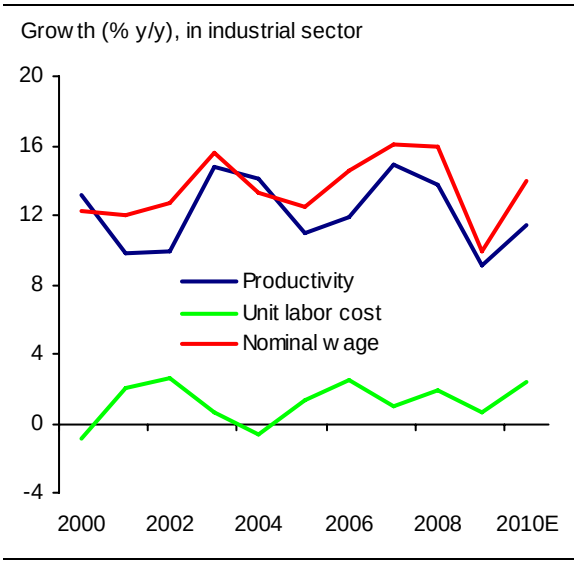
We would agree that China's trend inflation is moving from 2 percent before the crisis to 4-5 percent in the next few years. We think the main drivers for higher structural inflation in the next few years will be gradually rising food prices, tighter labor conditions in the low-end rural migrant sector, and resource and utility price adjustments.

Chart 40: It's mainly food



Source: CEIC, UBS estimates

Chart 41: Labor productivity growth has been strong



Source: CEIC, UBS estimates

China's local debt problem is unlikely to cause a debt or financial crisis

Debt and financial crisis. Since the beginning of 2010, China's local government debt and local borrowing from banks have worried investors. The sovereign debt crisis in Europe has further intensified these concerns. As we discussed in an earlier reports (see "*Local Government Finances and Land Revenues*", 24 February 2010), we think the issue of local government debt is unlikely to lead to a debt or financial crisis in China.

Our main points are: (i) the credit surge during the crisis, especially lending to local government investment platforms, has likely created a large amount of bad loans for the future, and we think 2.5-3 trillion RMB out of the 17 trillion total new lending in 2009-2010 will turn bad eventually; (ii) the NPLs could be about 5-6% of total bank lending, but they are likely to be realized gradually over the next few years, eroding banks' profits but not crippling the system; (iii) China's public debt as a share of GDP could be as high as 60% if we count local government debt and contingent liabilities, as well as old NPLs still on the books of asset management companies. However, 60% is still moderate and more importantly, can easily be financed by domestic saving; and (iv) both the central government and local governments have assets as well, and the net public debt could be substantially smaller.

Lending to local government investment platforms may push up the NPL ratio by a few percentage points, but the size of overall public debt is moderate and can be financed domestically

Rising external surpluses and trade frictions. China's current account surplus peaked in 2007 at almost 11% of GDP, and trade surplus peaked at 9% of GDP in the same year. The drop in external demand in 2009, the sharp rebound in commodity prices in 2010, and the strong domestic demand in China in the past 2 years helped to lower current account surplus to below 6% of GDP in 2010.

China's external surplus dropped in 2009-2010…

However, trade surplus has rebounded in the second half of 2010, thanks mainly to recovering export demand, and is expected to remain large in 2011. With global rates set to rise in the next few years, China's $3 trillion FX reserves are expected to yield rising returns, which should boost current account surplus. In the next year or two, very low interest rates abroad, prospect of fast growth in China, and strong expectations of exchange rate appreciation could lead to increased capital inflows.

…but could rise again

While the economic fundamentals continue to exert appreciation pressure on the RMB, international political pressures for a faster RMB appreciation has intensified, and will likely remain high in advanced economies where unemployment rates are high. China has de-pegged the RMB against the USD in June 2010 and allowed the currency to appreciate modestly so far.

RMB faces appreciation pressure

Some are concerned that if the exchange rate is not allowed to appreciate more, trade and current account surpluses will continue to increase, resulting in serious trade frictions between China and its trading partners, especially the United States. We expect continued modest (5% a year) appreciation of the RMB in the next couple of years, and see trade surplus gradually declining as a share of GDP. Under the circumstances, we think rising trade frictions are likely, but a serious trade war is unlikely.

We expect modest appreciation and increased trade friction, but no trade war

Of course, persistent large external surpluses and continued large-scale intervention could start to inflict serious cost on the sterilization operations, either directly or through the banking system. If the government is also unwilling to increase sterilization operations and unwilling to increase interest rates sufficiently and relies on administrative controls, the risk would be over-investment and asset bubbles. More on this point below.

The risk to the current practice of large-scale FX intervention lies somewhere else

Property market collapse. Property market bubble and collapse has been a big concern over the past few years. In 2010, the government again adopted measures to try to cool down property prices in large cities, including raising down payment requirements. However, prices in large cities continued to rise

Property prices continue to climb despite tightening measures

throughout 2010, albeit less rapidly than in 2009, and prices in many smaller cities where policies were not implemented grew more rapidly.

We do not think there is a big nation-wide property bubble or a collapse is imminent...

As written extensively in previous reports (see, for example, "*Ten Big Questions on China's Property*", 13 May 2010), we do not think China currently has a big and nation-wide property bubble, whether judging from the contribution of the property sector to GDP growth, or judging from the leverage level. We also do not think a property market collapse is imminent, despite the government's tightening measures, as these measures have been relatively mild in scope and degree and have not touched the fundamental reasons supporting solid growth in property prices.

...but we see property bubble as the biggest risk in the next few years

Nevertheless, we would argue that a property sector bubble is the biggest macro risk for China over the next few years. Sure, there are still important fundamental reasons supporting strong demand for modern housing going forward: rapid income growth, growth of urban population, and rapid and now wide-spread urban upgrades (which tear down old urban or suburban houses and replace them with modern buildings).

Lack of alternative investment instruments, low carrying costs, and monopolized supply of urban land are key factors supporting property demand & prices

However, the shallow financial market, lack of alternative investment channels and low interest rates are important factors why households want to allocate their wealth into property assets. The low carrying costs of property ownership (with no property tax) makes people more acceptable of low rental yields, and also lowers effective supply of rental properties. On the supply side, local governments are the monopoly suppliers of urban land, and as monopolies, they try to maximize land revenue by controlling supply and pushing up land (and housing) prices. It is still too early to tell whether the recent emphasis on providing more social and mass market housing will be genuinely implemented by local governments.

Structural reforms will take time...

Reforming the land supply system, changing local governments' incentives regarding land and property, and levying a wide-based property tax should greatly reduce the risk of a property bubble. However, these policies are highly political and unlikely to be adopted in the next couple of years.

...cheap abundant liquidity and negative real rates can fuel a bubble

Against this backdrop, if the government continues to run large external surpluses, leave ample liquidity in the economy, let real interest rates become increasingly negative, and remain slow in developing the financial markets, it would be extremely difficult for China to avoid asset bubbles, especially a property bubble.

Over-investment and over-build may end with a large drop in activity and over-capacity...

The result is not necessarily that property prices would sky-rocket, especially not the most widely used official prices, which are the average prices of properties often not comparable in location or quality. The result may be an over-build in properties and over-investment in related sectors. Similarly, when the bubble finally bursts, property prices may not fall much, but demand may decline substantially, which would result in sharply lower construction activity and demand for all the construction materials, commodities and machinery.

...and a boom-bust could seriously damage China's long-term growth

Given that China is still at an early stage of development, we are not forecasting a scenario in which growth potential would be lost forever (or even a decade or two). Nevertheless, a boom-bust could seriously damage China's long term growth.

References and further readings

Anderson, Jonathon, 2007, "The China Monetary Policy Handbook", UBS Investment Research, November 5

Forssboeck, Jens, and Lars Oxelheim, 2007, "The Transition to Market-Based Monetary Policy: What Can China Learn from the European Experience?", Journal of Asian Economics, Vol. 18, No. 2

Goldstein, Morris, and Nicholas Lardy, 2007, "China's Exchange Rate Policy: An Overview of Some Key Issues", paper presented at the Conference on China's Exchange Rate Policy, Peterson Institute for International Economics, October 2007

Goodfriend, Marvin and Eswar Prasad, 2006b, "Monetary Policy Implementation in China," BIS Papers No. 31

Lardy, Nicholas R., 2005, "Exchange Rate and Monetary Policy in China," CATO Journal, Vol. 25, No. 1, (Winter)

Kuijs, Louis, 2005, "Investment and Saving in China", World Bank Research Working Paper No. 3638, May 2005

Kuijs, Louis and Jianwu He, 2007,"Rebalancing China's Economy – Modeling a policy change", Research Working Paper No.7, September 2007, World Bank China Office, Beijing.

Laurens, Bernard J. and Rodolfo Maino, "China: Strengthening Monetary Policy Implementation", IMF Working Paper WP/07/14, January 2007

Ma, Guonan and Robert McCauley, 2007, "Do China's capital controls still bind? Implications for monetary autonomy and capital liberalization", BIS Working Papers No. 233

N. Loayza, K. Schmidt-Hebbel and L. Servén, 2000, "Saving in Developing Countries: An Overview", The World Bank Economic Review, September 2000

Podpiera, Richard, 2006, "Progress in China's Banking Sector Reform: Has Bank Behavior Changed?" IMF Working Paper WP/06/71, March 2006

Xie, Ping, 2004, "China's Monetary Policy: 1998-2002", Working Paper No. 217, Stanford Center for International Development

Wang Tao, 2008, "How Will China Grow? Part 1: The Re-leveraging of China", UBS Investment Research, December 9

Wang, Tao, 2009, "How to Look at China's Investment Boom and Risks", UBS Investment Research, November 30

Wang, Tao, 2010, "Local Government Finances and Land Revenues", UBS Investment Research, February 24

Wang, Tao, 2010, "Ten Big Questions on China's Property", UBS Investment Research, May 13

Wang, Tao, 2010, "How much should China worry about FX inflows?" UBS Investment Research, October 14

Wang, Tao, 2011, "How much liquidity is out there in China", UBS Investment Research, January 12

■ Analyst Certification

Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers; and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

Required Disclosures

This report has been prepared by UBS Securities Co. Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures. The figures contained in performance charts refer to the past; past performance is not a reliable indicator of future results. Additional information will be made available upon request. UBS Securities Co. Limited is licensed to conduct securities investment consultancy businesses by the China Securities Regulatory Commission.

Global Disclaimer

This report has been prepared by UBS Securities Co. Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS. In certain countries, UBS AG is referred to as UBS SA.

This report is for distribution only under such circumstances as may be permitted by applicable law. Nothing in this report constitutes a representation that any investment strategy or recommendation contained herein is suitable or appropriate to a recipient's individual circumstances or otherwise constitutes a personal recommendation. It is published solely for information purposes, it does not constitute an advertisement and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instruments in any jurisdiction. No representation or warranty, either express or implied, is provided in relation to the accuracy, completeness or reliability of the information contained herein, except with respect to information concerning UBS AG, its subsidiaries and affiliates, nor is it intended to be a complete statement or summary of the securities, markets or developments referred to in the report. UBS does not undertake that investors will obtain profits, nor will it share with investors any investment profits nor accept any liability for any investment losses. Investments involve risks and investors should exercise prudence in making their investment decisions. The report should not be regarded by recipients as a substitute for the exercise of their own judgement. Past performance is not necessarily a guide to future performance. The value of any investment or income may go down as well as up and you may not get back the full amount invested. Any opinions expressed in this report are subject to change without notice and may differ or be contrary to opinions expressed by other business areas or groups of UBS as a result of using different assumptions and criteria. Research will initiate, update and cease coverage solely at the discretion of UBS Investment Bank Research Management. The analysis contained herein is based on numerous assumptions. Different assumptions could result in materially different results. The analyst(s) responsible for the preparation of this report may interact with trading desk personnel, sales personnel and other constituencies for the purpose of gathering, synthesizing and interpreting market information. UBS is under no obligation to update or keep current the information contained herein. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this report is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues, however, compensation may relate to the revenues of UBS Investment Bank as a whole, of which investment banking, sales and trading are a part.

The securities described herein may not be eligible for sale in all jurisdictions or to certain categories of investors. Options, derivative products and futures are not suitable for all investors, and trading in these instruments is considered risky. Mortgage and asset-backed securities may involve a high degree of risk and may be highly volatile in response to fluctuations in interest rates and other market conditions. Past performance is not necessarily indicative of future results. Foreign currency rates of exchange may adversely affect the value, price or income of any security or related instrument mentioned in this report. For investment advice, trade execution or other enquiries, clients should contact their local sales representative. Neither UBS nor any of its affiliates, nor any of UBS' or any of its affiliates, directors, employees or agents accepts any liability for any loss or damage arising out of the use of all or any part of this report. For financial instruments admitted to trading on an EU regulated market: UBS AG, its affiliates or subsidiaries (excluding UBS Securities LLC and/or UBS Capital Markets LP) acts as a market maker or liquidity provider (in accordance with the interpretation of these terms in the UK) in the financial instruments of the issuer save that where the activity of liquidity provider is carried out in accordance with the definition given to it by the laws and regulations of any other EU jurisdictions, such information is separately disclosed in this research report. UBS and its affiliates and employees may have long or short positions, trade as principal and buy and sell in instruments or derivatives identified herein.

Any prices stated in this report are for information purposes only and do not represent valuations for individual securities or other instruments. There is no representation that any transaction can or could have been effected at those prices and any prices do not necessarily reflect UBS's internal books and records or theoretical model-based valuations and may be based on certain assumptions. Different assumptions, by UBS or any other source, may yield substantially different results.

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is communicated by UBS Limited, a subsidiary of UBS AG, to persons who are eligible counterparties or professional clients and is only available to such persons. The information contained herein does not apply to, and should not be relied upon by, retail clients. UBS Limited is authorised and regulated by the Financial Services Authority (FSA). UBS research complies with all the FSA requirements and laws concerning disclosures and these are indicated on the research where applicable. **France:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France SA. UBS Securities France S.A. is regulated by the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this report, the report is also deemed to have been prepared by UBS Securities France S.A. **Germany:** Prepared by UBS Limited and distributed by UBS Limited and UBS Deutschland AG. UBS Deutschland AG is regulated by the Bundesanstalt fur Finanzdienstleistungsaufsicht (BaFin). **Spain:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). **Turkey:** Prepared by UBS Menkul Degerler AS on behalf of and distributed by UBS Limited. **Russia:** Prepared and distributed by UBS Securities CJSC. **Switzerland:** Distributed by UBS AG to persons who are institutional investors only. **Italy:** Prepared by UBS Limited and distributed by UBS Limited and UBS Italia Sim S.p.A.. UBS Italia Sim S.p.A. is regulated by the Bank of Italy and by the Commissione Nazionale per le Società e la Borsa (CONSOB). Where an analyst of UBS Italia Sim S.p.A. has contributed to this report, the report is also deemed to have been prepared by UBS Italia Sim S.p.A.. **South Africa:** UBS South Africa (Pty) Limited (Registration No. 1995/011140/07) is a member of the JSE Limited, the South African Futures Exchange and the Bond Exchange of South Africa. UBS South Africa (Pty) Limited is an authorised Financial Services Provider. Details of its postal and physical address and a list of its directors are available on request or may be accessed at http:www.ubs.co.za. **United States:** Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a **'non-US affiliate'**), to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a report prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this report must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. **Canada:** Distributed by UBS Securities Canada Inc., a subsidiary of UBS AG and a member of the principal Canadian stock exchanges & CIPF. A statement of its financial condition and a list of its directors and senior officers will be provided upon request. **Hong Kong:** Distributed by UBS Securities Asia Limited. **Singapore:** Distributed by UBS Securities Pte. Ltd [mica (p) 039/11/2009 and Co. Reg. No.: 198500648C] or UBS AG, Singapore Branch. Please contact UBS Securities Pte Ltd, an exempt financial advisor under the Singapore Financial Advisers Act (Cap. 110); or UBS AG Singapore branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or report. The recipient of this report represent and warrant that they are accredited and institutional investors as defined in the Securities and Futures Act (Cap. 289). **Japan:** Distributed by UBS Securities Japan Ltd to institutional investors only. Where this report has been prepared by UBS Securities Japan Ltd, UBS Securities Japan Ltd is the author, publisher and distributor of the report. **Australia:** Distributed by UBS AG (Holder of Australian Financial Services License No. 231087) and UBS Securities Australia Ltd (Holder of Australian Financial Services License No. 231098) only to 'Wholesale' clients as defined by s761G of the Corporations Act 2001. **New Zealand:** Distributed by UBS New Zealand Ltd. An investment adviser and investment broker disclosure statement is available on request and free of charge by writing to PO Box 45, Auckland, NZ. **Dubai:** The research prepared and distributed by UBS AG Dubai Branch, is intended for Professional Clients only and is not for further distribution within the United Arab Emirates. **Korea:** Distributed in Korea by UBS Securities Pte. Ltd., Seoul Branch. This report may have been edited or contributed to from time to time by affiliates of UBS Securities Pte. Ltd., Seoul Branch. **Malaysia:** This material is authorized to be distributed in Malaysia by UBS Securities Malaysia Sdn. Bhd (253825-x).**India :** Prepared by UBS Securities India Private Ltd. 2/F,2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000 SEBI Registration Numbers: NSE (Capital Market Segment): INB230951431 , NSE (F&O Segment) INF230951431, BSE (Capital Market Segment) INB010951437.

The disclosures contained in research reports produced by UBS Limited shall be governed by and construed in accordance with English law.