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Designing a Framework for Independent Monetary Policy in China

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Abstract

As the Chinese economy becomes more market-oriented and continues its rapid integration into the global economy, having an independent and effective monetary policy regime will become increasingly important. What nominal anchor and associated monetary policy strategy would be most appropriate for China? Our view is that an inflation targeting framework, broadly defined, would serve China best. Theory and experience from around the world both suggest that making low inflation the nominal anchor for monetary policy would be the most reliable way to enable the People's Bank of China to anchor inflation expectations, and thereby stabilize domestic inflation and employment against macroeconomic shocks. We argue that it is both desirable and feasible for China to put in place, in the next couple of years, a minimal set of financial sector reforms and regulations that would enable the country to adopt an inflation target as a credible nominal anchor for monetary policy. A flexible exchange rate regime and central bank independence are also essential for an inflation targeting regime to function well. A money growth target could serve as a useful operational tool over the short term to maintain low inflation, but it would not constitute a good stand-alone nominal anchor.

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I. Introduction and Overview

China's rising prominence in the world economy has meant that the efficacy of its macroeconomic management has taken on considerable importance, not just from a domestic perspective but also from broader regional and international perspectives. Monetary policy is traditionally one of the key tools of short-term demand management. In China, however, monetary policy has in recent years operated under difficult constraints, including a fixed exchange rate regime, an underdeveloped financial system and numerous institutional weaknesses.

As China's economy develops and becomes more complex, and as its integration with the world economy continues, monetary policy will need to shoulder an increasingly large burden in ensuring stable, noninflationary growth. Rising integration, for instance, implies an increasing vulnerability to external shocks, and monetary policy is typically the first line of defense against such shocks. Although China's government deficit and public debt to GDP ratios are quite low by international standards, the existence of large contingent fiscal liabilities implies that there may be less room for maneuver on fiscal policy.

Having an independent monetary policy is of course the first order of business. Maintenance of an exchange rate regime with very limited de facto flexibility could expose the economy to significant risks of macroeconomic instability. While capital controls do provide some room for maneuver for monetary policy even under such a regime, this room tends to be quite limited in practice and could result in inadequate control of investment growth and inflationary/deflationary pressures. Indeed, in recent years, controlling credit and investment growth has become especially complicated due to the large inflows of speculative capital that have been testing the exchange rate peg to the U.S. dollar (and, since July 2005, the tightly-managed peg to a currency basket that looks to all intents and purposes like a continued peg to the dollar).

But a move towards greater exchange rate flexibility is not the solution by itself. Indeed, enhancing the effectiveness of the monetary transmission mechanism poses difficult challenges independent of the constraints related to the exchange rate regime. Principal among these is the reform of the financial system, since that is the conduit through which monetary policy has an influence on economic activity. This is by far one of the most daunting tasks facing Chinese policymakers.

The Chinese state-owned banking system had labored under the legacy of directed lending until the late 1990s. Progress has been made since then in terms of improving the commercial orientation of some of the key parts of the banking sector, and significant strides have been made in improving banking supervision and regulation. But Chinese banks are still far from being robust commercially-driven financial entities. Given the dominance of the banking sector in China's financial system landscape, this has important implications for monetary policy transmission.

It would, of course, be unfair to lay the blame for poor financial sector performance on the state banks alone. Notwithstanding the termination of the official policy of directed lending to state enterprises, the imperative of allowing for unviable state enterprises to continue their operations has continued to sap the banks, which are implicitly forced to continue financing the operation of these enterprises. And the lack of alternative investment opportunities for households and alternative sources of financing for firms has meant that the banking sector has had less incentive to improve its performance.

The essence of the challenge is to transform the banking system from an arm of off-budget fiscal policy using captive savings of households that support transfers to state enterprises into a banking system that can direct credit to its most valued uses given correct interest rate signals. This means that ultimately banks must compete for funds freely in deposit, managed liability, and interbank markets against other credit opportunities made available to households and firms. This is a necessary condition for pricing loans efficiently.

Of course, other necessary conditions must be met for banks to provide efficient intermediation—management/owners must have their own capital at risk with the freedom to direct credit to borrowers of their choice without pressure or incentive to make loans favored by government. And banks must have systems in place to evaluate creditworthiness, to price loans appropriately, and to design, monitor, and enforce loan covenants.[2] Also, banks must have the legal authority to intervene in the management of a borrowing firm and/or to call loans when broken covenants authorize such actions. Borrowers must not get subsidized credit support from the government, either directly or implicitly, so that they feel the impact of the interest cost of credit and the discipline of loan covenants and respond efficiently. Institutions must be set up to make and enforce laws that protect creditor rights. Finally, a reasonably competitive banking system is necessary so that packages of loan rates and covenants follow closely the risk-adjusted cost of making loans.

Even in the best of circumstances, it will take years for China to put in place the components of a modern banking system described above. This is especially so when one recognizes that the transition must be supervised and regulated with great care to preserve the public's confidence in the banks and guard against moral hazard problems associated with the explicit or implicit insurance of bank deposits by the government. Moreover, even if all of the above conditions were met, the consequences of the legacy of directed lending would further complicate the transition.

This discussion raises the question of what sort of nominal anchor and associated strategy for monetary policy would serve an economy like China well if the *de facto* dollar peg were to be eliminated and progress was made on financial sector reforms. We think that an inflation

[2] Covenants are agreements between banks and borrowers included in loan contracts that state mutual obligations and rights, including the terms upon which the banks may call a loan.

targeting framework has great promise in this regard because theory, and experience around the world, both suggest that making low inflation the nominal anchor for monetary policy in China is the most reliable way to enable the People's Bank of China (PBC) to stabilize domestic inflation and employment against macroeconomic shocks. Specifically, we believe that the PBC could be provided with the necessary tools to target inflation so as to anchor inflation expectations firmly and make inflation targeting work well. While a relatively strong case can be made for this approach on conceptual grounds, a number of thorny practical issues arise in its implementation. We review these in some detail, and conclude that the approach we suggest is workable in China.

In particular, we believe that it is both desirable and feasible for China to put in place, in the next couple of years, a minimal set of financial sector reforms and regulations that would enable the country to adopt an inflation target as a credible nominal anchor for monetary policy. The adoption of an inflation targeting framework is desirable because China needs a fully flexible, independent monetary policy instrument to counteract internal and external shocks to inflation and employment to which a market-oriented, open Chinese economy would be increasingly exposed. A flexible independent monetary policy oriented to domestic objectives is fast becoming indispensable for the management of the economy.

We also believe that it is feasible for China to adopt an effective inflation targeting framework at an early date because the minimal set of reforms and regulations required to do so are relatively straightforward to implement. These necessary reforms would give the PBC unconditional control of the monetary base and aggregate bank reserves, which would improve PBC control of aggregate bank deposits. Reforms and regulations would also be needed to ensure that banks could withstand the financial stresses resulting from fluctuations in interest rates that may be required from time to time to sustain price stability. We believe that Chinese monetary policy geared toward stabilizing domestic inflation would yield the best macroeconomic outcomes on average over time, even if this framework were to be initiated before the banking system was fully modernized. Indeed, this framework and the macroeconomic stability emanating from it may be essential for creating a conducive environment for pushing forward financial sector reforms.

A great deal of the discussion in this paper is inevitably colored by the fact that China has been undergoing two major transitions—from a low-income developing country to a middle-income emerging market, and from a command economy to a more market-oriented economy. Thus, while every economy is special in its own way, China's circumstances are particularly special—not only because of its sheer size—but because it is an emerging economy in the above two senses. Accordingly, in our analysis, we incorporate China-specific structural and institutional features where relevant, especially when evaluating China's monetary policy framework against international best practices.

We explain in Section II why an inflation target is to be preferred to a fixed exchange rate or a stand-alone money growth target as the nominal anchor for monetary policy in China. Then, to inform our discussion of Chinese monetary policy that follows, in Section III we use the modern theory of monetary policy to highlight some mechanics of targeting inflation. We

explain why and how stabilizing inflation also stabilizes employment and allows an economy to grow at its potential. And we describe the means by which monetary policy actions work through the banking system to stabilize inflation.

In Section IV, we describe the main features of the current monetary and banking framework in China in order to identify institutional constraints in the Chinese financial sector that may preclude the credible adoption of inflation targeting. In Section V, we describe a minimal set of financial sector reforms necessary for China to credibly and effectively adopt a framework for independent monetary policy with an inflation target as the nominal anchor.

II. Inflation Target as Nominal Anchor

The core responsibility of monetary policy is to employ a credible nominal anchor to maintain a stable purchasing power of money over time. A nominal anchor that stabilizes inflation and inflation expectations enhances the flexibility and effectiveness with which relative goods prices, real wages, real interest rates, interest rate spreads, asset prices and foreign exchange rates adjust to domestic and external shocks. Without a credible nominal anchor an economy is susceptible to fluctuating beliefs about future inflation. Unstable beliefs could manifest themselves in inflation (or deflation) scares--sudden, sharp changes in inflation expectations with the potential to generate feedback to current prices. Inflation scares are among the most destabilizing shocks to inflation, employment and growth; policy responses to counter them are of necessity drastic and painful.

The quest for macroeconomic stability has motivated a great deal of analysis and experimentation with alternative monetary policy frameworks. Formal inflation targeting—an explicit or implicit official target range for the inflation rate and an acknowledgement that low inflation is a priority for monetary policy—has emerged in recent years as the leading nominal anchor for monetary policy in practice around the world. Inflation targeting has important advantages over the two leading competitors for a nominal anchor—a fixed nominal exchange rate and a money growth target. The remainder of this section outlines the shortcomings of the competitors and lists the advantages of an inflation target. The reasoning applies equally well to emerging market economies such as China as it does to advanced industrial economies.

A fixed nominal exchange rate regime borrows the nominal anchor from abroad. When the nominal exchange rate is fixed, arbitrage in traded goods markets causes the domestic price level and inflation rate to move with those of a trading partner on average over time. If the trading partner anchors its price level and inflation rate, domestic inflation is well anchored, too. Otherwise, the fixed exchange rate system imports the variability in foreign inflation or deflation.

Even if the foreign inflation rate remains low on average, the fixed exchange rate forces domestic policymakers to accept one of two unpleasant alternatives. Either domestic interest rates follow foreign rates closely, or the home country must impose controls on private international capital flows to try and insulate itself. There are problems with either

alternative. In the first case, if home and foreign business cycles are out of phase, then the home country could import cyclically destabilizing interest rate policy actions. In the second case, capital controls provide room for monetary policy to move domestic interest rates somewhat independently of foreign interest rates. But controls impede the efficient flow of private international capital. And monetary policy directed at domestic employment and inflation objectives in the presence of a fixed exchange rate can result in a problematic accumulation or decumulation of foreign exchange reserves that threaten the viability of the fixed exchange rate regime itself.[3] Moreover, once the viability of a fixed rate regime is called into question, the expected returns to attacking the fixed rate make the regime susceptible to destabilizing speculative flows that are by then virtually impossible to deter with capital controls.

For all of the above reasons, fixed exchange rate regimes have tended to be fragile in practice, even when supported by capital controls; and so they have proven to be unreliable nominal anchors. The long-standing attachment to fixed exchange rates probably resulted from the fact that the alternative domestically-oriented nominal anchors—money or inflation targets—require a competent central bank with operational independence sufficient to manage the nominal anchor credibly, as well as sound fiscal policies and exchange rate flexibility supportive of the nominal anchor. As the fixed rate option came to be seen as unsustainable, however, more countries opted to do the hard work of building the infrastructure needed to support credible inflation targeting. It has taken considerable time, effort, and a commitment by political systems to develop both the government institutions and the degree of macroeconomic discipline required for such a domestic nominal anchor to be effective. But the upshot is that numerous central banks around the world now employ an explicit target range for inflation, e.g., the Eurosystem and the Bank of England, as the nominal anchor for monetary policy, and others, such as the United States, target low inflation implicitly.[4]

What of the money growth target as the nominal anchor? Monetary targets were usefully employed by the U.S. Federal Reserve, among other central banks, to stabilize inflation in the 1970s and 1980s.[5] And money growth targets continue to be employed productively to help target inflation in some central banks today, including in the Eurosystem, which

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[3] Excessive outflows can force a depreciation of the exchange rate unless domestic interest rates are raised to deter them. Excessive inflows create inflationary money growth unless they are sterilized or interest rates are cut to deter them. Sterilization is ultimately ineffective because it short-circuits the adjustment process and can become very costly. See our discussion below of sterilization as practiced recently in China.

[4] See Bernanke et al (1999) for a discussion of inflation targeting around the world, and Goodfriend (2005) on implicit inflation targeting in the United States

[5] Goodfriend and King (2005).

supplements its inflation target with a reference range for money. However, central banks in other countries with well-developed banking and financial systems, e.g., the U.S. Federal Reserve, employ interest rates to target low inflation, largely ignoring money growth targets in the process.

Nevertheless, it must be emphasized that the circumstances in which money can be ignored in the implementation of monetary policy are special. They are environments in which a central bank can reliably steer aggregate demand to credibly hit an inflation target by managing interest rates alone.[6] Even in the United States circumstances could arise--if interest rates hit the zero bound, or inflation becomes high and volatile again—in which the Federal Reserve would need to utilize money targets to implement monetary policy. Moreover, targeted money growth continues to play a helpful role in targeting inflation in countries with less developed financial systems and less reliable interest rate channels of monetary transmission. That is, in economies with problems of this sort, growth targets for deposits, bank reserves, or the monetary base can play an operational role in targeting inflation. We argue below that money growth targets would be of great help for targeting inflation in a country such as China, which is just beginning to modernize its banking system and to utilize indirect monetary policy instruments in lieu of direct credit controls to implement monetary policy.

We believe, however, that a money growth target would not be a good stand-alone nominal anchor for Chinese monetary policy. In principle, a target for the growth of a broad monetary aggregate such as M2 could be managed so as to maintain low inflation on average. However, we think that a money growth target should be used in conjunction with an announced explicit inflation target to help maintain low inflation.

Our reasoning is as follows. China could take advantage of its current low rate of inflation to set a low inflation target range that could be left in place indefinitely. The inflation target could thereby serve nicely as a secure nominal anchor for monetary policy with the potential to anchor inflation expectations firmly. The same could not be said of a stand-alone growth target for money. The relationship between money growth and inflation may shift significantly in China in the years to come because of innovations in banking and financial markets. Hence, one should expect that the PBC might need to adjust its target for money growth from time to time to maintain stable inflation in light of structural shifts in the demand for money.

The need to adjust targeted money growth, however, greatly weakens its value as a stand-alone nominal anchor. Variable money growth targets cannot serve usefully to anchor

[6] Of course, a central bank must support its interest rate policy actions with open market operations or central bank lending to accommodate the quantity of base money demanded along the chosen interest rate path. But the resulting path for base money need not play a causal role in the transmission of monetary policy in this case.

expected inflation. Moreover, target changes might be undertaken to stimulate employment at the expense of temporarily higher inflation in the future. Hence, an attempt by the PBC to utilize targeted money growth as the nominal anchor without specifying an inflation target would greatly increase the chance of destabilizing inflation scares.

To sum up—there is good reason for the PBC to adopt an inflation target, supplemented with money growth targeting, as the nominal anchor for Chinese monetary policy. Although inflation targeting gained ground initially by process of elimination, it has gained more ground over time because it has proven to be a viable nominal anchor and because price stability has yield good results in practice. Where central banks are given the necessary institutional support, and instrument independence to stabilize inflation, they have been able to acquire an impressive degree of credibility for low inflation that has anchored inflation expectations firmly and thereby contributed importantly to stabilizing actual inflation.[7] Under such circumstances, an inflation targeting regime can generate a virtuous circle of credibility. This is evident in the United States, where the Federal Reserve's implicit targeting of low inflation has made an important contribution to macroeconomic stability. The United States has had only two relatively mild recessions, in 1990-91 and in 2001, and two of the longest expansions in its history since inflation was stabilized in the early 1980s. Other countries have had similar experiences.

III. The Mechanics of Targeting Inflation

In order to guide our recommendations below for implementing inflation targeting in China, here we summarize briefly the mechanics of inflation targeting, its advantages, and the necessary conditions for it to work well.[8] We use the principles of the modern theory of monetary policy to guide our discussion but emphasize that the concepts we use below are quite general and apply, at a basic level, even to a socialist market economy such as China.

The Fundamental Principle of Inflation Targeting: The modern theory of monetary policy has at its core monopolistically competitive firms that set product prices at a markup over marginal production costs (e.g., wages and material costs) expected to maximize profits over time. Firms consider changing product prices only if demand and cost conditions threaten to compress or elevate actual markups significantly and persistently relative to profit-maximizing markups. For instance, firms consider raising product prices when strong aggregate demand increases the intensity of resource utilization, and thereby causes wages and materials costs to rise relative to prices. And firms consider cutting product prices when weak aggregate demand causes firms to relax resource utilization and thereby bid down wage and materials costs relative to prices.

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[7] See, for instance, Bernanke et al. (1999) and Goodfriend (2005).

[8] This exposition draws on Goodfriend (2002) and Broaddus and Goodfriend (2004).

Such reasoning yields the fundamental principle of inflation targeting: Monetary policy geared to targeting inflation must manage aggregate demand so that production costs rise at the targeted rate of inflation—then firms will raise product prices at the targeted rate of inflation because they are confident that doing so will keep actual markups at profit-maximizing markups.

Stabilizing Employment: The principle of inflation targeting given above has the important implication that monetary policy that targets inflation also stabilizes employment. The reasoning is as follows. First—an economy with a stable inflation rate must be one in which firms maintain their profit-maximizing markups on average, otherwise actual inflation would deviate from targeted inflation as firms attempted to restore their profit-maximizing markups. Second—an economy in which monetary policy sustains the profit-maximizing markup would operate as if firms sustained the profit-maximizing markup by adjusting their own product prices flexibly and continuously. Third—thus targeting inflation makes actual output conform to potential output, i.e., aggregate output produced by a real business cycle model with perfectly flexible prices. Fourth—this reasoning implies that monetary policy geared to targeting inflation also yields the best cyclical stabilization of employment.[9] Fifth—the best that monetary policy can do is to stabilize inflation and accept real business cycles as the efficient response to exogenous fluctuations in real variables such as productivity growth.

Accommodating Productivity Growth: Any rate of productivity growth is compatible with a particular inflation target. We can see why as follows. Focusing on labor costs, we can express the dollar cost of producing one unit of output (sometimes called unit labor cost) as the ratio of the dollar wage per hour worked over productivity per hour worked. Hence, production costs rise over time at the rate of wage inflation minus the rate of labor productivity growth. This means that when actual markups are stabilized at profit-maximizing markups, firms are content to raise product prices at the rate of wage inflation minus the rate of labor productivity growth. We also know that competition for labor causes firms to raise wages over time at the rate of labor productivity growth plus an adjustment for goods inflation. Hence, any rate of productivity growth is consistent with the maintenance of the profit-maximizing markup and the targeted rate of inflation.

This point is particularly important for a rapidly developing country like China with a high, and potentially highly variable, rate of productivity growth. It means that Chinese monetary policy can maintain a low target for inflation even if productivity growth fluctuates over a relatively wide range. Inflation targeting, thereby, would allow China to accommodate its growth potential while stabilizing cyclical fluctuations in employment.

Preventing Inflation and Deflation Scares: In addition to the direct benefits of inflation targeting described above, inflation targeting improves macroeconomic performance indirectly by tying down inflation expectations. For instance, credibility for low inflation

[9] See Goodfriend and King (1997).

achieved by the Greenspan Fed played an important role in holding down actual and expected inflation on three occasions since the mid-1990s—when the unemployment rate dropped to 4% during in the late 1990s, when the Fed cut interest rates from 6 ½% to 1 ¾% to fight the recession in 2001, and when energy prices rose sharply in 2004-5.

Imperfect credibility for low and stable inflation, on the other hand, makes an economy vulnerable to fluctuating beliefs about inflation or deflation, which in extreme cases can take the form of inflation or deflation scares.[10] For instance, inflation scares manifested in sharply rising long-term bond rates have destabilized the U.S. economy on many occasions. Moreover, they appear to have been triggered by events beyond the central bank's control. For instance, the early 1980 inflation scare in the United States was apparently triggered, in part, by the oil price shock and the Soviet invasion of Afghanistan; the 1983-84 U.S. inflation scare may have been triggered in part by the growing government budget deficit; and the 1994 inflation scare may have been set off by doubts about congressional support for the policy tightening being undertaken by the Fed at the time.

What makes inflation and deflation scares so destabilizing? Inflation scares present a central bank with a dilemma. Ignoring them encourages even more doubt about a central bank's commitment to low inflation. However, to restore credibility for low inflation, a central bank may have to tighten monetary policy aggressively to weaken aggregate demand, slow wage growth, and elevate markups above profit-maximizing markups to offset an inclination of firms to raise prices. In other words, when faced with an inflation scare, a central bank may have to push very hard—probably harder than it would like—in order to make sure that inflation doesn't spiral out of control. The Federal Reserve did exactly this on a number of occasions prior to and during the disinflation of the early 1980s.[11]

Deflation scares are equally problematic. A deflation scare does not involve a choice between contracting employment and loosening credibility for low inflation. Monetary policy can fight a deflation scare by stimulating demand, tightening labor markets, raising wages, and recompressing markups relative to profit-maximizing markups. A deflation scare involves a different credibility problem, however: the possibility that interest rate policy might be immobilized at the zero bound before deflation can be deterred, and that the central bank might be unwilling or unable to act against deflation with unconventional monetary policy at the zero bound. Moreover, a policy vacuum at the zero bound could encourage ill-advised fiscal policy actions. Some fiscal actions, such as money-financed government budget deficits, might be desirable under extreme circumstances. But many fiscal actions, such as wasteful spending, distortionary credit subsidies, or inefficient forbearance in the banking system, would not be. The government might resort to off-budget policies such as anti-

[10] Goodfriend (1993) and Goodfriend and King (2005) document how inflation scare shocks have destabilized the U.S. economy.

[11] Ibid.

competitive measures to support wages or prices in favored sectors. Such actions can lower potential GDP substantially, and appear to have done so in the Great Depression of the 1930s in the United States.[12]

The threat to potential output exacerbates the deflation scare by lowering future income prospects and causing households and firms to cut current spending, which reduces labor demand, lowers wages, and elevates markups further. In the final analysis, then, a deflation scare, like an inflation scare, is problematic because it has the potential to lead to a protracted recession.

Managing Pressure on Reserve Positions with Control of Aggregate Bank Reserves: Bank reserves are deposits of commercial banks at the central bank. A central bank can create aggregate bank reserves by purchasing securities or other assets, making loans, or making net purchases of central bank bills. Conversely, a central bank drains reserves from the banking system by selling securities, calling in loans, or issuing central bank bills. For the purposes of discussing the transmission of monetary policy, one must distinguish between required and excess reserves. Required reserves are those that commercial banks must hold at the central bank, usually computed as a required reserve ratio against deposits at commercial banks. And excess reserves are deposits held by commercial banks at the central bank above and beyond those that satisfy the reserve requirement.

To the extent that excess reserves pay interest below a risk-adjusted rate on loans and securities that commercial banks could otherwise hold, commercial banks have an incentive to keep excess reserves to a minimum. Hence, the creation of excess reserves stimulates bank lending. On the other hand, because banks must meet minimum reserve requirements, a contraction in excess reserves causes banks to contract lending.

In China, the concern is that a reduction of remuneration on excess reserves today could be counterproductive because it would release liquidity into the system and increase bank lending. To prevent this, the PBC should be prepared to soak up the excess liquidity released into the system by issuing PBC bills. A reduction of interest on excess reserves in China is not to be valued for an immediate policy effect, but because it will tighten the PBC's management of pressure on reserve positions in the future. We return to this issue in Section V below.

A central bank must have full control of aggregate bank reserves to target inflation effectively and to stabilize inflation expectations credibly. Control of bank reserves is <u>necessary</u> because a central bank must manage aggregate demand over the business cycle by manipulating the supply of bank reserves. For instance, to offset weakness in aggregate demand, a central bank must maintain (or even increase) the growth of bank reserves as deposit demand and loan demand weaken. The excess supply of bank reserves puts

[12] See Cole and Ohanian (2001).

downward pressure on interbank interest rates and induces banks to cut loan rates, too, thereby encouraging borrowing and spending. To offset excessive strength in aggregate demand, a central bank must maintain (or even decrease) the growth of bank reserves as deposit demand and loan demand strengthen. In this case, the excess demand for bank reserves drives up interbank interest rates, induces banks to raise loan rates, and discourages borrowing and spending.[13]

Compromised Control of Bank Reserves: In practice, a central bank's control of bank reserves may be compromised because it is obliged to acquire or sell assets for reasons other than managing aggregate bank reserves to stabilize inflation. In general, there are three reasons why a central bank might be obliged to do so: i) it might be directed to buy government debt, i.e., to finance a government deficit in whole or in part with newly created bank reserves, ii) it might be directed to lend to banks, non-financial firms, or state enterprises, iii) it might be obliged to buy foreign assets to support the government's managed or fixed foreign exchange rate policy. For instance, when a nation such as China chooses to manage its foreign exchange rate within a tight range, the central bank is obliged to accommodate the excess supply or demand of domestic money for foreign exchange at the stabilized exchange rate. Thus, the central bank is obliged either to acquire foreign assets by creating domestic bank reserves, or to sell foreign assets by draining reserves from the domestic banking system.[14]

It is possible for the central bank to offset, or sterilize, the effect of the required asset action on aggregate bank reserves by taking an opposite asset action with another asset or liability on its balance sheet. For instance, a central bank could sterilize directed lending to state enterprises with reserves drained from the sale of government securities of equal value. There would be no net effect on aggregate bank reserves in this case. Likewise, the central bank could sterilize purchases of foreign assets with offsetting sales of government securities.

Sterilization, however, is of relatively limited use against externally directed asset acquisition mandates. Sterilization is possible only as long as the central bank has assets in its portfolio with which to sterilize directed asset purchases. Central banks such as the PBC have the authority to borrow to sterilize the effect on reserves of directed asset purchases such as those arising from foreign exchange inflows. But central bank borrowing also creates problems that we will return to below. In any case, sterilization of foreign exchange flows leaves domestic interest rates unaffected, and does little to reduce the incentives that gave rise to the foreign exchange flows in the first place. Even when supplemented with capital controls, sterilization in the presence of a fixed or managed exchange rate encounters the problems that that we discussed in Section II.

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[13] This exposition is drawn from Goodfriend (2004).

[14] We follow the usual presumption--that the demand for currency is unaffected by capital flows—so that unsterilized inflows or outflows show up as changes in bank reserves.

To make inflation targeting fully credible, the central bank needs to be free completely of any significant obligations that compromise its ability to manage aggregate reserves to stabilize inflation. That means, in particular, that monetary policy credibly geared to inflation targeting must be accompanied by a willingness on the part of the government and the public to allow a substantial degree of flexibility in the foreign exchange rate, so that exchange rate adjustments, and not central bank purchases and sales of foreign assets, can allow the foreign exchange market to clear.

Robustness of the Banking System to Fluctuations in Interest Rates: In order to manage aggregate bank reserves consistently to stabilize inflation, a central bank must also be willing to accept the consequences for short-term interest rates—that short rates may need to fluctuate in a relatively wide range to maintain low and stable inflation. Even without any directed asset acquisition mandates, a reluctance to allow short rates to fluctuate might cause a central bank to manage bank reserves to smooth short-term interest rates. An inclination to smooth interest rates would compromise the central bank's ability to stabilize aggregate demand effectively and severely undermine the credibility of its inflation target.[15]

In order for the central bank to allow short-term rates to fluctuate widely, the banking system must be able to operate effectively in the presence of significant fluctuations in short rates. At a minimum, the banking system must consistently deliver efficient payments services to depositors and maintain the confidence of depositors. The payments system and the financial viability of banks must be robust to interest rate fluctuations. Banking assets must maintain sufficient value to back deposits. And the central bank should be prepared to provide liquidity to the banking system so that the demand for currency can be accommodated consistently without destabilizing the fractional-reserve banking system. Other aspects of financially robust banking, which are important independent of the monetary policy framework, are also relevant for the ability of banks to withstand large fluctuations in short rates. In particular, banks must be well supervised and regulated, in part, to protect the moral hazard associated with deposit insurance. Banks must be well capitalized so that bank managers have a strong incentive to see that deposit funds are loaned or invested prudently. Only when the above conditions are satisfied will a central bank be willing to stick to a path for bank reserves consistent with its inflation target regardless of the consequences for interest rates. And only then can monetary policy geared to targeting inflation be fully credible.

Flexibility of Deposit, Loan, and Non-bank Interest Rates: Rates on bank deposits, bank loans, and non-bank money market instruments should be flexible to reflect the cost of loanable funds in the interbank market in order to broaden the channels by which monetary policy is transmitted to the economy. For instance, an increase in the interbank rate due to a tightening of reserve conditions would induce banks to bid deposit rates up in an attempt to

[15] Poole (1978), pp. 105-10, describes how interest rate smoothing contributed to the destabilization of inflation and output in the United States.

acquire loanable funds more cheaply than in the interbank market. Allowing deposit rates to rise would provide incentives for those households and firms not then borrowing from banks to increase their saving. Furthermore, arbitrage between deposit rates and non-bank money market instruments would cause rates on non-bank instruments to rise, so the higher return to saving would be felt even more widely throughout the economy. Beyond spreading monetary transmission more broadly, flexible interest rates would minimize disruptions in banking and credit flows that would otherwise occur because rigid interest rates caused disintermediation in certain credit markets.

The Reliance of Inflation Targeting on Credibility: Inflation targeting depends heavily for its effectiveness on the credibility of the central bank's perceived power, will, and competence to manage aggregate bank reserves to stabilize aggregate demand. The reliance on credibility is both a complication and a virtue. It is a complication because a monetary policy regime geared to inflation targeting needs substantial institutional support: a central bank must be given full control of aggregate bank reserves and it must use reserve control consistently to stabilize inflation, the banking system must be robust against interest rate fluctuations, and banks must be well regulated and supervised, especially given implicit deposit insurance. In addition, the country must have in place a fiscal policy regime which is not expected to need or resort to inflationary finance in the future.

However, once a country creates credible institutional support for inflation targeting, then the reliance of inflation targeting on credibility is a virtue. If the public believes that the central bank has the power and the scope to use monetary policy to maintain stable inflation in the future, then firms will be inclined to keep price adjustments on target because they will regard any deviations of actual markups from profit-maximizing markups as temporary. Thus, credibility for low inflation tends to be self-enforcing to a considerable extent. Credibility buys time for a central bank to recognize and counteract threats to price stability. With credible institutional support in place, markets tend to be relatively forgiving of temporary tactical policy mistakes that may be committed by a central bank as it learns how to move its reserves instrument to stabilize inflation.

Guidance for Policy Actions: Even in the United States, which has maintained low inflation and inflation expectations consistently for two decades, the Federal Reserve has had to allow short-term interest rates to fluctuate in a relatively wide range to maintain price stability. For instance, short rates were 3% in 1993 during the "jobless recovery" from the 1990-91 recession, 6 ½% at the peak of the long boom in the late 1990s, 1% in an effort to fight deflation in the aftermath of the 2001 recession, and they reached 4% in November 2005 in the wake of the spike in energy prices.

Thus, a central bank must be prepared to pursue an activist interest rate policy that pre-empts fluctuations in inflation. To do so, a central bank must rely on a variety of indicators to develop a conditional forecast of inflation that can serve as a guide for preemptive interest rate policy actions. The Federal Reserve, for instance, uses a variety of indicators of inflationary or deflationary potential in the economy to steer its interest rate policy. It uses time series data on price markups, estimates of the gap between actual output and potential

output, estimates of capacity utilization in the manufacturing sector, measures of employment growth relative to estimated labor force growth, indicators of inflation expectations in bond markets (index-linked and others), and various measures of core and headline inflation.

China, too, would need to rely on a variety of economic indicators to guide monetary policy geared to targeting inflation. The transitional nature of the Chinese economy creates unique problems in the production and interpretation of statistical indicators. Even with absolutely accurate data in hand, there is relatively little history on which to base forecasts of inflation. Productivity growth, which is difficult to forecast even in the United States, is more difficult to predict in an emerging market economy like China where growth rates could vary in a much wider range. Nevertheless, we expect that with some effort China should be able to satisfy adequately the statistical needs for implementing inflation targeting.

One important point remains. Although monetary targeting was a valuable guide for U.S. monetary policy during the 1970s and the Volcker disinflation of the early 1980s, the Federal Reserve today pays relatively little attention to the monetary aggregates in its implementation of monetary policy.[16] With the advantage of a long track record of reasonably stable historical correlations to draw on, and a considerable degree of credibility for low inflation well established, there is little, if any, incremental value in taking monetary aggregates into account in setting interest rate policy in the United States This is far from the case in China, where it would help to guide monetary policy to keep track of the growth of various aggregates such as the monetary base, bank reserves, bank deposits, and loans against estimated growth rates believed to be consistent with low inflation.

IV. Description of Monetary Policy Framework and Financial Sector in China

In this section, we present a broad overview of the current state of monetary, banking, and financial markets in China. The economy is becoming increasingly developed and market-oriented, necessitating a shift from inflexible direct methods of allocating credit and implementing monetary policy, to flexible indirect methods using a liberalized banking system and the management of bank reserves by the central bank. The maintenance of a tightly managed foreign exchange rate as the nominal anchor for monetary policy has subjected the PBC to having to deal with enormous capital inflows in recent years that threaten to overwhelm its control of aggregate bank reserves. We describe the transformation of the Chinese financial system in light of these needs, with particular emphasis on those aspects of the system that will command our attention in Section V, where we will discuss the minimal reforms needed for China to adopt an independent monetary policy.

The Financial System: The financial landscape in China is dominated by the state-owned banking system. The stock and bond markets have rather limited roles. Total deposits in the

[16] See Goodfriend and King (2005).

banking system amount to about 200 percent of GDP, compared to an outstanding stock of government debt of about 25 percent of GDP. The corporate bond market is small and the stock market is relatively thin as well. With only a small number of enterprises permitted to list and about two-thirds of shares in listed enterprises held by the state and not traded, the stock market does not play a major role in intermediating household saving into corporate investment.[17]

The banking system, in turn, has been dominated by four large state commercial banks (SCBs) that account for about two-thirds of the assets of the banking system. The joint stock commercial banks (JSCBs) have expanded the size of their balance sheets quite rapidly in recent years and now account for about [15] percent of total banking system assets. There are a few policy banks such as the China Development bank that have explicit directed lending mandates. The banking system is rounded out by a number of other smaller banks, including rural and urban credit cooperatives (see the chapter by Barnett in Prasad, 2005, for a fuller description of the structure of the Chinese banking system).

Under WTO accession commitments, foreign banks will be allowed to enter China at the end of 2006. Although the degree of penetration by foreign banks is likely to be limited in the foreseeable future, the Chinese authorities are using this date as a deadline for banks to meet a number of objectives, including meeting capital adequacy ratios of 8 percent, improvements in governance indicators etc.

Most of the reform efforts to date have focused on three of the SCBs—Bank of China (BOC), China Construction Bank (CCB) and Industrial and Commercial Bank of China (ICBC). An important part of this process has been to invite foreign strategic investors to take equity stakes in these banks, in the hope that this will expedite improvements in corporate governance and lead to transfers of managerial and risk-management expertise (see Hope and Hu, 2005). Each foreign strategic investor is permitted to hold up to a 20 percent equity stake in a bank, with a cap of 25 percent on the total equity stakes of all such investors. To make progress on bank restructuring and entice foreign strategic investors, large amounts of NPLs have been transferred from these banks to asset management companies. In addition, the PBC, through a holding company called Central Huijin Investment Company, has infused capital (using portions of the stock of foreign exchange reserves) into these banks. As a consequence, these banks already meet or are close to meeting the threshold capital adequacy ratio of 8 percent, with adequate provisioning for loan losses.

[17] The PBC's Monetary Policy Report for the first quarter of 2005 reports that, of the funds raised in the domestic financial market in that quarter, bank loans account for 89 percent, corporate bonds and stocks together account for 1 percent, and the rest are government securities.

These banks are also being permitted to do IPOs abroad in order to bolster their capital bases. CCB has already had a successful IPO in Hong Kong SAR, and the other two banks are also expected to do IPOs in the near future.

In sum, these three SCBs are in much stronger shape financially than they were a couple of years ago. Whether these banks now constitute efficient financial intermediaries is a different matter, of course. On that score, as discussed elsewhere in this paper, much remains to be done. A similar picture is true of the banking system at large.

Monetary Policy Implementation – Instruments and Institutional Setup: The primary instruments of monetary policy used by the PBC are open market operations, changes in the discount rate and reserve requirements, aided and abetted by "window guidance" to banks on their lending operations.[18] Xie (2001), following Yi (2001), classifies central bank lending, interest rate policy (which includes interest rates on PBC lending and reserves held at the PBC, as well as other rates including banks' deposit and lending rates) and open market operations as the main instruments. He refers to reserve requirements, the rediscount rate, instructive credit plans, credit policy and window guidance as complementary instruments.

Xie (2001) also indicates that the monetary base is the operational target and money supply is the intermediate target. More recently, the PBC has been using growth rates of both money and bank lending as explicit intermediate targets. The relationship of these aggregates to real activity has not necessarily stayed stable over time. Furthermore, with the growth rate of M2 consistently being a few percentage points higher than nominal GDP growth over the last few years, there has been a trend decline in velocity, complicating things further. Yet, given their easy observability, targets for growth of these two aggregates have become an important device for the PBC to signal its monetary policy intentions.

Reserve requirements have recently been used quite extensively as a monetary policy instrument. The required reserve ratio (ratio to a bank's deposits) was reduced from 13 percent during 1988-98 to 6 percent in 1999, in part to allow banks to better manage their funds. This ratio was raised to 7 percent in September 2003 and further to 7.5 percent in April 2004, as part of a series of measures intended to control lending amidst concerns about the rapid pace of credit growth and potential overheating in the economy.

In addition to changes in reserve requirements, differentiated reserve requirements were introduced in April 2004. This affected second-tier banks, including the joint stock commercial banks that had accounted for a significant part of the surge in lending growth in 2003. Those banks in this category that did not meet certain standards in terms of the

[18] A telling (and probably slightly unfair!) indication of the importance still accorded to such non-market based and non-prudential measures to control credit growth is a sub-heading in the chapter on Monetary Policy Conduct in the PBC's 2004Q2 Monetary Policy Report (page 44). It reads: "Moral suasion intensified to guide credit structure optimization."

quality of their loan portfolios and capital adequacy were subject to a reserve requirement of 8 percent, half a percentage point higher than the standard required reserve ratio. Rural and urban credit cooperatives were exempt from this higher reserve requirement.

One complication in using the reserve requirement ratio as an instrument of monetary policy is that the state banks, especially the SCBs, have tended to maintain substantial amounts of excess reserves at the PBC. A portion of these excess reserves is believed to be used for interbank settlement and liquidity management purposes, but it is difficult to discern how large the banks' perceived need for excess reserves for this purpose is. The PBC clearly has a concern that a significant amount of excess reserves makes the banks less sensitive to changes in its policy interest rates in the interbank market, thereby reducing the effectiveness of another of its instruments. This led the PBC to reduce the rate of remuneration on excess reserves to 1.62 percent in December 2003 and further to 0.99 percent in April 2005 (compared to the unchanged rate of 1.89 percent on required reserves).[19]

In recent years, the amount of excess reserves maintained by banks (in percent of total bank deposits) has declined from 7.3 percent at the end of 2000 to about 4 percent in March 2005. At that time, excess reserves were on the order of 4 percent for the SCBs, 5.3 percent for the JSCBs and 5.6 percent for the RCCs. This still suggests a fairly high level of liquidity in the banking system. Notwithstanding the availability of all this liquidity and the low interest rate on excess reserve holdings at the PBC, the lending behavior of the banks, especially the SCBs, has been held in check partly due to their objective of meeting the capital adequacy requirement of 8 percent by 2007.

The PBC has been trying to build up the interbank market and improve its effectiveness as a channel for the transmission of monetary policy. The existence of substantial excess reserves of course vitiates this objective. In some ways, it makes other monetary policy instruments such as the rediscount rate and reserve requirements not only less effective but also less predictable in their outcomes. For instance, in October 2003, a modest change in the reserve requirements caused the SCBs to pull liquidity out of the interbank market as they viewed the move as possibly signaling further increases in reserve requirements as the PBC sought to aggressively tighten credit. Consequently, there was a sharp spike in interbank rates as the smaller banks, especially the JSCBs, sought funding from the interbank market.

Another problem with the interbank market is that a number of other players, not just banks, operate in this market. These include securities companies and other nonbank financing institutions, implying that the rates in this market are determined based on liquidity availability and needs of not just banks but these various other institutions as well (Green, 2005). In any case, the interbank market has expanded rapidly in recent years, with the total transaction volume rising from around 1 trillion yuan in 1999 to about 17 trillion

[19] The need to structurally reduce the amount of excess reserves appears to have trumped the concern that this could push more liquidity into the financial system.

yuan in 2003, before falling off to 13 trillion yuan in 2004. Repurchases account for the bulk of these transactions (about two-thirds in 2004), with interbank borrowing accounting for about 10 percent and outright cash transactions for the remainder (PBC's First Quarter 2005 Monetary Policy Report).

A further challenge faced by the PBC is that liquidity management is complicated by unpredictable seasonal fluctuations in government deposits maintained at the PBC. Tax and other revenue collections during the year typically lead to a buildup of deposits over the course of the year. These deposits are generally withdrawn towards the end of the year to finance various expenditure obligations (withdrawals for public investment, in particular, tend to be concentrated towards year-end). This introduces strong and somewhat unpredictable seasonal components in government deposits at the PBC.

In addition to its policy rate (rediscount rate) that affects the interbank market, base deposit and lending rates of the state banks have traditionally also been set by the PBC, but only with prior approval of the State Council. More recently, the PBC has been afforded some independence to change the floating bands around the base rates that provide some degree of flexibility to banks in setting deposit and lending rates. Interest rate liberalization has proceeded in steps over the last couple of years. On January 1, 2004, the PBC increased the flexibility in the lending rate to 0.9-1.7 times the base rate for commercial banks and urban credit cooperatives and 0.9-2.0 times the base rate for rural credit cooperatives. Financial institutions were also given the freedom to determine lending rates for individual borrowers based on their risk profiles and other characteristics, rather than being constrained by guidelines on pricing loans related solely to size and ownership structure of borrowers.

Interestingly, banks seem to have taken only limited advantage of this added flexibility. A survey conducted by the PBC for its 2004Q3 Monetary Policy Report (Table 2 of that report) reveals that, in the first three quarters of 2004, about half of all loans were made at or below the base lending rate. The state commercial banks, in particular, priced two-thirds of their loans at or below the base rate and did less than 5 percent of their new lending at more than 1.3 times the base rate. A possible explanation for this outcome is that the degree of flexibility in lending rates may simply not have been sufficient to compensate banks for lending to private sector firms, which are inherently riskier. The regional commercial banks and rural credit cooperatives, on the other hand, made better use of this flexibility, pricing 66 percent and 93 percent of their loans, respectively, above the base rate.

On October 29, 2004, the ceiling on lending rates was scrapped altogether (except for urban and rural credit cooperatives).[20] But there is still little evidence that banks, especially the large ones, are using the flexibility afforded to them to substantially redirect lending to the private sector at higher interest rates. A survey in the 2005Q1 Monetary Policy Report,

[20] See Dunaway and Prasad (2004) for an assessment of the potential benefits of this policy shift.

similar to the one noted above for 2004, reveals an almost identical picture in terms of the pricing of loans by different types of banks. This could in part reflect concerns banks have about their own risk-assessment capabilities, especially in an environment where there is still strong pressure to avoid accumulation of new nonperforming loans (NPLs). A less benign explanation is that banks are responding to an informal incentive structure that remains unchanged—loans made to state enterprises are still regarded as less risky in terms of reputational costs to bank managers and loan officers, while loans made to private sector enterprises that become nonperforming could entail charges of incompetence or corruption. Deficiencies in the legal framework may also play a role. Weak legal protection means that collateral provisions are difficult to enforce, so lending to the private sector carries additional risks.[21]

Along with the liberalization of lending rates, banks were given more freedom to make downward adjustments to deposit rates. The maintenance of a floor on lending rates and a ceiling on deposit rates appears intended to ensure that competition among banks does not drive down margins, which are seen as essential to maintain bank profitability and enable them to fortify their balance sheets by using profits to write off loan losses.

The Exchange Rate Regime: The exchange rate regime was unified in [1996] and, since [1997], the renminbi has been maintained at a fixed parity relative to the U.S. dollar. This regime was officially classified by the authorities as a managed float since the rate could in principle move by 0.03 percent around this parity. The rate was essentially unchanged, however, at the central parity.

The number of participants in the foreign exchange market, the China Foreign Exchange Trading System, was limited to a handful including some of the SCBs. In fact, these banks acted as clearing agents for many of the trades that they settled directly without the transactions ever reaching the CFETS. This kept the foreign exchange market relatively thin and underdeveloped. But it also made the mechanics of tightly managing the exchange rate easier for the PBC since it could correct any deviations from the central parity relatively quickly and easily.

On July 21, 2003, the renminbi was revalued by 2.1 percent relative to the U.S. dollar and the government announced that the external value of the renminbi would henceforth be set with reference to a basket of currencies, although neither the currency composition of the basket nor the basket weights have been publicly disclosed. The new regime also allows for

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[21] A draft bankruptcy law, intended to strengthen legal remedies available to lenders, is in the works. However, there are some concerns that, as drafted, this law could have certain problems in terms of strengthening creditors' rights as it puts the obligations of enterprises to their employees and to the state ahead of creditors. A possible reason for this outcome is that, against the background of corruption and weak governance in state banks, there was a fear that giving primacy to creditors' rights could lead to asset-stripping through collusion between bankers and enterprise managers.

fluctuations of up to 0.3 percent around the reference rate. In principle, this could mean that the exchange rate is allowed to drift up (or down) by 0.3 percent each day, which could amount to a significant appreciation (or depreciation) over a period of time. In practice, however, the renminbi has barely moved against the dollar since July; its lack of movement is also not consistent with variations that may have been expected based on various plausible assumptions about the currency composition of the reference basket.

This rigidity of the exchange rate has important consequences for monetary policy. It has obviously constrained monetary policy independence by making it difficult for the PBC to use interest rates as a monetary policy instrument to meet domestic policy objectives. The existence of capital controls, even though they may not be fully effective, of course implies that there is some room for monetary policy independence. But the financial repression and capital controls needed to keep the banks liquid has affected bank efficiency and has other serious costs.

The complications created by a fixed exchange rate have been most evident in the remarkably rapid build-up of international reserves since 2001, when the renminbi began to come under appreciation pressures. Gross international reserves stood at 780 billion U.S. dollars at end-September 2005. The spike in the pace of reserve accumulation during 2001-04 is largely attributable to a surge in speculative capital inflows (through both official and unofficial channels; see Prasad and Wei, 2005), although a rapid expansion in the trade surplus seems to have become a more important factor during 2005. During 2005, reserve accumulation has averaged about $18 billion a month.

Until 2002, government bonds had been used as the primary instrument for sterilization of foreign inflows. Some conversion to central bank (CB) bills took place in late 2002, when the stock of government bonds available for repo transactions had shrunk to very low levels. The first full-fledged auction of new CB bills took place in May 2003. CB bills have now become the primary instrument for sterilization of capital inflows and, with the surge in inflows, the stock of outstanding CB bills has increased very rapidly.

The fraction of reserves sterilized by the central bank has varied over the last few years and it not even straightforward to assess exactly how much sterilization has taken place.[22] By and

[22] Stephen Green estimates that, in 2004, the PBC sterilized about 48 percent of total net foreign exchange inflows ($98.3 billion of base money withdrawal relative to inflows of about $206 billion). This includes about $74.5 billion in net issuance of PBC bills. The overall sterilization estimate includes an amount of $23.8 billion in PBC bills that this analyst believes were issued in secret to the four state commercial banks. Repo transactions were used to sterilize base money in the middle of the year but their net effect on the monetary base during the year was about zero. This analyst estimates that, during July-August 2005, the sterilization ratio may have dropped below 20 percent, as the PBC shifted monetary policy to a more neutral mode to offset any adverse effects of the currency revaluation.

large, the PBC seems to have had little trouble soaking up liquidity using CB bills. While a few analysts have taken the low levels of sterilization as signaling, at least in some periods, potential problems in sterilization operations, this is far from obvious. The rate of credit growth has, after all, come down significantly relative to the very high levels observed in 2003-04. Furthermore, the interest rate on CB bills remains quite low.

A confluence of forces appears to have made sterilization operations relatively easy to carry out. Saving rates continue to be very high; corporate saving, in particular, has increased sharply over the last year. Most of these savings invariably flow into the banking system since there are few alternatives. This has made the banks flush with liquidity, particularly at a time when they are under pressure to hold down growth in credit. As noted above, the SCBs are also aggressively trying to improve their balance sheets, including in terms of meeting capital adequacy norms set by the government, in order to attract strategic investors and make a case for doing IPOs. In this context, banks have an incentive to hold PBC bills rather than increase their lending since corporate lending, for instance, carries a capital requirement of 100 percent while no capital needs to be put aside for lending to the government. Thus, there is a great deal of demand for PBC bills even at relatively low interest rates, well below the rates of return on industrial country treasury bonds. This means that, at the margin, sterilization is essentially a money-making operation for the PBC.

But such a cost-benefit calculation can be deceptive. One of the principal concerns is that the lack of exchange rate flexibility not only reduces monetary policy independence, it also affects banking sector reforms. As argued by Prasad and Rajan (2005), the inability of the PBC to use interest rates as a primary tool of monetary policy implies that credit growth is often controlled by much blunter and non-market-oriented tools, including non-prudential administrative measures. This vitiates the process of banking reform by keeping banks' lending growth under the administrative guidance of the PBC rather than letting it be guided by market signals. This constraint has also perpetuated large efficiency costs via provision of cheap subsidized credit to inefficient state enterprises. The incidence of these and other costs of banking system inefficiency are not obvious, but they are probably ultimately borne by depositors in the form of low real returns on their saving.

V. Minimal Reforms to Support an Independent Monetary Policy for China

In this section, we describe the set of reforms of the banking system and exchange rate policy necessary for China to adopt an independent monetary policy geared to targeting inflation as the nominal anchor.[23] In the first place, China must allow foreign exchange rate movements

[23] We are not proposing formal, elaborate, particular, inflation targeting procedures advocated by some economists and pursued by some central banks. We are simply recommending a monetary policy regime with an inflation target as the nominal anchor. Our proposal is more closely related to recommendations for the United States found in Bernanke (2004) and Goodfriend (2005). It is also related to the "inflation targeting lite" approach of authors such as Stone (2003), although we believe that the subordination of the inflation

(continued)

to assume the predominant role in international adjustment so that the PBC is free to manage aggregate bank reserves to stabilize inflation without the burden of sterilization. As a mechanical matter, it ought to be relatively straightforward for China to introduce greater exchange rate flexibility. In doing so, however, China must be prepared to substitute an inflation target for the exchange rate as the nominal anchor for monetary policy. This means that China must put in place banking reforms to facilitate the effective transmission of monetary policy and to enable the banking system to endure the fluctuations in interest rates necessary to stabilize inflation.

Even though the modernization of the banking system will take years to complete, a relatively minimal set of banking reforms essential for the transmission of monetary policy could be accomplished in a much shorter period. A number of concerted steps have already been taken to reform the major banks and we feel that a one or two year horizon should be sufficient for the essential reforms. Indeed, our view is that the modernization of the banking system should not be rushed to improve the effectiveness of monetary policy transmission. Doing so would be counterproductive because it risks financial instability that could undermine the whole process.

The Chinese should prepare, as soon as possible, the relatively minimal set of reforms that we outline below to move to independent monetary policy in case the country requires the fully-credible, unconstrained, application of monetary policy to stabilize domestic inflation and employment at an early date. On the basis of the description of the Chinese monetary and banking sector in Section 4, and our discussion of the mechanics of targeting inflation in Section 3, we point out where China has already made progress on the necessary reforms and recommend additional reforms that need to be undertaken.

Effective Management of Pressure on Reserve Positions: China has already put in place some of the institutional arrangements necessary for the PBC to effectively manage aggregate bank reserves in the short run. It has created a deep, liquid market in PBC bills through which the central bank can manage aggregate bank reserves effectively with open market operations. The Chinese have also created an active, liquid RP market that the PBC uses to manage the supply of reserves on a day-to-day basis. The infrastructure for borrowing or lending reserves among banks in the interbank market on the basis RPs or on an uncollateralized basis at the CHIBOR rate is well-established. The level of interbank rates is determined flexibly to clear the market for borrowing and lending reserves, and the spread between the rates varies with such things as the nature of collateral backing the loan. The reserve market allows a given pressure on reserve positions to be distributed evenly across banks because each has the opportunity to obtain or release reserves into the market at the same interbank interest rates. Our positive assessment of the interbank market may be a little excessive in light of a number of unsatisfactory features of the market: its relative thinness

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target to other macroeconomic objectives would hamper the effectiveness of monetary policy in anchoring inflation expectations.

and illiquidity, the fact that major players may have excessive market power, and the fact that non-bank participants have the potential to destabilize the market. If so, we believe that the Chinese financial authorities can and will remedy such defects before too long.

In order to manage bank reserves over the long term, the PBC must continually accumulate assets to provide for the trend growth of bank reserves and currency. In recent years, foreign exchange acquisitions in connection with China's exchange rate policy provided more than enough longer run growth of the PBC balance sheet; earlier, PBC lending to banks had done so. Because the stock of foreign assets has grown so large, and because a large portion has been sterilized with PBC bills, even if foreign exchange inflows slow or reverse, the PBC should be able to provide for trend growth of its balance sheet for the next few years by allowing its bills to run off. Eventually, however, China should create a liquid government securities market to enable the PBC to grow its balance sheet by acquiring government securities rather than by accumulating foreign exchange or by lending to banks. That would facilitate the conduct of monetary policy by making the PBC more independent of foreign exchange policy and banking supervision and regulation, and laying the groundwork for the PBC to become an independent central bank.[24]

We noted in Section 4 that the behavior of excess reserves in China is somewhat puzzling: excess reserves are higher on average and more variable than, say, in the United States. Moreover, Chinese banks are said to react to changes in aggregate reserve supply by absorbing or releasing excess reserves to some degree, short-circuiting somewhat the PBC's leverage to influence pressure on reserve positions. Does such behavior preclude the adoption of independent monetary policy in China? We think not. The relative insensitivity of Chinese banks to incremental changes in PBC-managed pressure on reserve positions is to be expected given the fact that banks know that the PBC has little leeway with which to pursue independent monetary policy when the foreign exchange rate has to be tightly managed. Hence, it is not credible that the PBC will be able to undertake much of a campaign to tighten or loosen monetary policy relative to conditions in the US. The banks realize this and are understandably reluctant to respond much to an incremental tightening or easing of reserve pressures by the PBC because they doubt there can be much follow through. In the absence of the managed foreign exchange constraint, the PBC could overcome such complications with more aggressive, sustained open market operations that credibly moved interbank rates in a wider range.

Nevertheless, we recommend two reforms to stabilize and reduce excess reserve demand. First, the PBC should in general refrain from discretionary reserve requirement adjustments because these induce volatility in excess reserve demand as banks prepare for and try to anticipate changes in reserve requirements. Second, the PBC should encourage banks to economize on excess reserves by discontinuing the payment of interest on excess reserves.

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[24] Broaddus and Goodfriend (2001) make this point with reference to the U.S. Federal Reserve.

The PBC could make the reform "revenue neutral" for banks initially by returning the initial lost interest earnings to each bank independently of its excess reserve holdings, and gradually withdrawing the transfers over time. To the extent that the banking system chooses to reduce excess reserves, the PBC should be prepared to soak them up by selling PBC bills.[25]

It may take time for excess reserve demand in China to fall to minimums held by banks in those countries with the most modern banking systems. Chinese banks might have a greater precautionary demand for reserves because of a greater perceived possibility of a collapse of the interbank market for reserves, more uncertainty about the terms of access to the PBC discount window, and greater need for excess reserves in executing payments on behalf of customers than banks in the most modern systems. As the Chinese financial system develops, however, we would expect the precautionary demand for excess reserves to decline as it has elsewhere.

The Exchange Rate Constraint and the Cost of Sterilizing Foreign Exchange Inflows: We saw in Section IV the enormous inflow of foreign exchange that the PBC had to absorb in the last few years to maintain the tightly managed foreign exchange rate. The trend growth of the demand for currency and reserves absorbed much of the monetary base thus created. Nevertheless, the PBC sterilized [somewhat less than half—to be checked] of the growth of base money between 2003 and 2005 to keep bank lending and deposit creation in a range believed to be compatible with low and stable inflation. In particular, we saw that the PBC used PBC bills, reserve requirement increases, and moral suasion to keep the inflow of foreign exchange from compromising its management of bank reserves. If one judges the degree of pressure on reserves by the level of CHIBOR or the RP rate, then the PBC has allowed some easing of pressures on reserve positions since the middle of 2004, for instance, the RP rate has fallen around 2 ½ % to around 1 ¾ %. Currently, expected inflation appears to be well anchored in China, and even though interbank interest rates have been falling for over a year, the situation seems sustainable because the Chinese public apparently believes that the PBC will take whatever action is necessary to stabilize inflation if need be, even if that means an adjustment of the RMB exchange rate.

Given the success that the PBC has had in sterilizing foreign exchange inflows and containing inflation to date, is there any reason to question the sustainability of the current policy regime in which the tightly managed exchange rate serves as the nominal anchor for monetary policy? To put it differently, is there any urgency in reforming the exchange rate regime to enable China to adopt independent monetary policy at an early date? We believe that there is. Technically, we can imagine the PBC fully offsetting the effect on bank reserves of capital inflows by selling PBC bills to the banks. In order to appreciate that sense of urgency, one needs to understand the costs and risks incurred with continuing to sterilize

[25] If the stock of Chinese government bonds outstanding were greater, the government bond market were sufficiently deep and liquid, and the PBC held a significant share of that market, then the PBC could sell government bonds to soak up excess reserves.

capital inflows on such a massive scale. In what follows, we outline those costs and risks from three perspectives: the cost of sterilization on banking and credit intermediation, the potential cost of sterilization to the government's fiscal position, and cost of sterilization from the perspective of macroeconomic adjustment.

Consider the effects of sterilization on the banking system. Full sterilization means that the growth of aggregate bank reserves and bank deposits is maintained on an initial path thought consistent with non-inflationary economic growth. By the banking system balance sheet constraint, the growth of banking system assets is maintained on its initial path as well. Thus, the sterilization of monetary base growth with PBC bills means that the banking system is induced to finance PBC acquisitions by calling in loans. Alternatively, one can imagine the public being induced to purchase the PBC bills, in which case the public cuts back on bank deposits and the banks must cut loans by an equivalent amount.[26] Either way, sterilization is costly from this perspective because it crowds out bank lending. One might think that this is not a bad thing if the country is concerned with excessive credit growth. Recall, however, that the sterilization was presumed to allow the PBC to maintain whatever growth of reserves, deposits, and bank assets the central bank thought compatible with stable economic growth and low inflation. The point is this: sterilization requires that banks continually substitute PBC bills for loans in bank portfolios to sustain this desired growth path. When bank portfolios contain no more loans, then sterilization is no longer feasible. Hence, sterilization is unbalanced financial policy and inherently unsustainable.

Consider the effect of sterilization from the government's fiscal perspective. The sterilization of foreign exchange inflows induces the PBC to finance the acquisition of a portfolio of foreign currency denominated assets with funds borrowed in RMB denominated PBC bills. Holding the exchange rate fixed, this investment generates positive cash flows for the PBC because short-term RMB interest rates are below equivalent short-term dollar rates. The defense of the RMB is currently sustainable in the sense that the PBC actually "makes money" from its acquisition of dollar assets. However, the PBC's investment in dollar assets involves market risk, namely, the risk that the Chinese might let the RMB appreciate against the dollar before the PBC unwinds its portfolio of dollar assets. Thus, although the cash flows are positive the expected value of the net investment position in foreign exchange may not be. The degree of market risk depends, in part, on how much longer and at what scale the capital inflows are likely to continue and how willing the PBC is to continue building its risky position in foreign exchange waiting for a reversal. The government might be reluctant to take on more foreign exchange risk at some point, recognizing that Chinese taxpayers must ultimately bear any losses.

There are other possibilities. We are not predicting such an outcome, but it is possible that a recession in the United States could occur in the next couple of years that causes U.S. short-

[26] In this second case, the PBC would drain reserves from the banking system to maintain the desired degree of pressure on reserve positions.

term interest rates to fall below RMB rates thought appropriate to contain inflation in China. In this case, not only might investors have more incentive to move capital into China, but cash flow on the PBC sterilization could turn negative. This scenario could subject China to even larger fiscal losses than the first.

Should the PBC protect itself from U.S. interest rate risk by lengthening the maturity of its foreign security portfolio? Possibly, but doing so entails the risk of capital losses on U.S. long securities if interest rates rise in the US, capital begins to flow out of China, and the PBC must sell its U.S. securities at a capital loss to finance capital outflows. In other words, the PBC assumes interest rate risk as well as exchange rate risk as a consequence of the sterilization of foreign exchange, risks that expose Chinese taxpayers to substantial fiscal losses if things go wrong.

There is another important (but hidden) cost of defending the tightly managed exchange rate system separate from the risks associated with potential capital losses due to movements in the exchange rate or shifts in industrial country interest rates (Prasad, 2005). Controls on capital outflows and domestic financial repression are required to help maintain at low levels the rate of interest paid on central bank bills. To maintain bank profits, the government must then mandate low interest rates on deposits. Thus, the cost of these distortions is ultimately borne by depositors in the banking system—which includes most households, given the lack of alternative investment opportunities—in the form of very low real rates of return on their deposits.

Finally, consider the cost of sterilization from the perspective of macroeconomic adjustment. In principle, full sterilization of capital inflows leaves the PBC's pressure on reserve positions completely unaffected. In short, full sterilization "finances" the capital inflow without doing anything to deter it. In other words, sterilization short-circuits the interest rate adjustment process that would act to slow the inflow.

However, incomplete sterilization is costly in terms of macroeconomic adjustment, too. If capital inflows are significant, and especially they are expected to persist, banks would likely react to the relaxation of reserve positions and the expected persistent fall in interbank rates by significantly increasing loans. Moral suasion would only be temporarily effective in deterring the expansion of loans in this case. In the absence of any expected response of the PBC, inflation expectations would rise, nominal interest rates would reflect an increased inflation premium, more capital would eventually be attracted into the country by the prospect of higher RMB yields and the likelihood of an eventual appreciation of the RNB. In short, incomplete sterilization is costly because it risks creating an inflation scare and a recession when followed by the inevitable tightening of monetary policy to restore exchange rate stability and credibility for low inflation.

Of course, inflation remains low in China today in large part because the PBC has sterilized most of the effect of the huge inflow of foreign exchange on bank reserves as evidenced by the relative stability of interbank rates. Inflation probably also remains low because the public believes in the PBC's credibility for low inflation. High inflation that sharply eroded

the forced savings in bank deposits would so undermine public support for the government that it is inconceivable the government would allow it. In fact, an alternative concern is that credit growth may be leading to excess capacity and eventual deflationary pressure in the future. The investment boom is occurring not so much as a consequence of monetary policy however, but because the government has encouraged bank funding of high investment to substitute for the low Chinese consumption in aggregate demand. Of course, the saving rate may be unusually high in China because the public is nervous about the sustainability of stable growth in China due to the monetary and banking policy problems that are the focus of our paper.

At any rate, the main point is this: a continuation of monetary policy geared to maintaining a tightly managed foreign exchange rate as the nominal anchor carries substantial risks. The PBC is not in full control of its destiny. Its policy options all come with great risks in terms of disintermediation of bank lending, fiscal cost to Chinese taxpayers, or an inflation scare followed by a recession. In different circumstances, the tightly managed foreign exchange rate could precipitate the risk of a deflationary recession.

To avoid predicaments like this in the future, and to facilitate the necessary adjustments in current circumstances, China would benefit from the additional reforms needed to adopt an independent monetary policy. With an inflation target as the nominal anchor, China could allow the exchange rate, and not PBC purchases and sales of foreign exchange, to play the predominant role in international adjustment.

Robustness and Flexibility of the Banking and Exchange Rate System: We saw in Section IV that China has already taken a number of steps to modernize its banking system but much remains to be done. The question is how much more modernization is needed to support independent monetary policy? China has already created much of the institutional flexibility for the PBC to transmit monetary policy actions effectively to aggregate demand—through a liquid bank reserves market, and with fully flexible, competitively determined interbank interest rates. China has allowed deposit and lending rates to be more responsive to the interbank rate; although there continues to be a ceiling on deposit rates and a floor on lending rates. A relaxation of these remaining rate restrictions would essentially complete the monetary policy transmission mechanism. We believe that it only remains for the PBC to be willing and able to *exploit* the monetary transmission mechanism, if need be, to move short-term interest rates in a wide range to target inflation effectively. In particular, it is not necessary to fully modernize China's banking system before moving to independent monetary policy. It is only necessary to make the banking and exchange rate system *robust to interest rate flexibility*. We explain what we mean as follows.

First, China must be prepared to relax its tight management of the foreign exchange rate to give the PBC the leeway to allow short-term interest rates to fluctuate widely. Currently, the PBC must keep short-rates in China in a relatively narrow range that is compatible with U.S. monetary policy. Lower rates too much, and outflows of foreign exchange reserves threaten to force a depreciation of the RMB; raise rates too much, and sterilization of capital inflows creates costs discussed at length above.

Second, Chinese banking authorities must complete the removal of NPLs from Chinese banks (to attain international benchmarks for capital adequacy standards, with adequate loan loss provisioning) in order to fortify the banking system against flexible interest rate policy. Those banks relatively more encumbered by a legacy of NPLs than others would be at a competitive disadvantage in offering interest on deposits, especially when the PBC was required to raise short-term interest rates to stabilize inflation. Depositors attempting to move to healthier banks would put weaker banks in financial distress. Since banks are tightly connected through the payments system and the network of interbank balances, the financial distress would threaten the entire banking system, and make the PBC reluctant to raise interest rates against inflation.

The removal of NPLs, *per se*, is only part of what is essential to improve the robustness of the Chinese banking system. The process by which NPLs are removed is also critical for the robustness of the banking system. NPLs must be removed in a way that avoids moral hazard problems, i.e., that gives the management of recapitalized banks the incentive to manage banks prudently. It is critically important that the removal of NPLs is accompanied by improved bank supervision and regulation. Chinese banking authorities must deal with a three-fold problem: new directed lending, legacy NPLs, and the deposit insurance guarantee. We discuss these in turn.

New Directed Lending: The government must refrain from directing new lending likely to end up as NPLs. The government should undertake any future transfers to state-owned enterprises outside the banking system. Moreover, even if explicitly directed lending is forbidden, incentives may be skewed toward implicitly directed lending if bank managers perceive political pressure to lend to the state sector, or for that matter, to favored sectors or projects elsewhere in the economy. Bank supervisors and regulators must give managers protection against such political pressures. Recapitalized banks should be free of directed lending so that owners and managers are given strong incentives to manage their banks prudently on commercial considerations. One approach would be to get owners and managers to have their own capital at stake in their banks.

Legacy NPLs: Bank regulators must recognize that managers have an incentive to keep rolling over existing loans so that they do not show up on their books as problem loans. Managers can do this because the banking authorities enforce a ceiling on deposit rates and a floor on loan rates that keeps cash flows in the banking system positive, in spite of the large share of NPLs on bank balance sheets. Therefore, bank regulators must intervene to force a write down of the book value of such “virtual NPLs” to remove NPLs from bank balance sheets. Before doing so, bank regulators must secure sufficient funding, through the issue of debt or explicit funding from the government, to transfer new capital to banks in exchange for the removal of NPLs. After completing the removal of NPLs from bank portfolios and recapitalizing the banking system, regulators should relax the ceiling on deposit rates and the floor on loan rates so that loan rates and deposit rates are free to be determined flexibly and competitively.

The Deposit Insurance Guarantee: In order to ensure that the recapitalization of the banking system is sustainable to protect against moral hazard in connection with the implicit insurance of Chinese bank deposits, supervisors and regulators must be empowered to ensure that bank capital remains above required minimums, and to intervene promptly to restrict a management's control of a bank's assets in the event that a bank's capital falls below required minimums.

We believe that China could complete the reforms outlined above in a couple of years, in large part because Chinese banking authorities have long been working toward achieving these goals. We may have seen relatively little explicit progress on such reforms to date. But the Chinese have overcome some of the key hurdles. The authorities clearly recognize the need for bank reform, China has the resources to deal with the NPL problem, and the authorities appreciate the urgency for doing what is necessary to support independent monetary policy for China.

It will take much longer for Chinese banks to modernize, i.e., to learn to price loans efficiently according to risk, and to design and monitor loan covenants efficiently. It will take time to bring human, financial, and physical capital in the Chinese commercial banking sector up to the level of the world's most advanced banks. Nevertheless, we believe that Chinese monetary policy can be effectively transmitted through a banking system that may be far from the efficient banking frontier, as long as the banking system is financially robust against interest rate fluctuations and Chinese exchange rate policy does not inhibit the PBC from employing the full range of interest rate variability to stabilize inflation.

Credibility and Communications: The PBC's current communications with respect to its policy actions are of relatively little importance because constraints on Chinese monetary policy heavily restrict the PBC's monetary policy independence. The main role for communications in the current environment is to explain the steps that China is taking to modernize the banking and financial system. We think that the PBC and the China Banking Regulatory Commission (CRBC), which was spun off from the PBC in 2003, are doing a reasonably good job of advertising and explaining institutional reforms that have been undertaken in this regard.

We think it would be useful, as well, for the PBC and the CRBC to explain the reforms, in part, as necessary to adopt a framework for independent monetary policy with inflation as the nominal anchor. The PBC, in particular, should explain, along the lines we've outlined in this paper, the need to prepare China for independent monetary policy and its advantages for China over the long run. Talking about the need for reforms as a precondition for independent policy would both motivate the reforms and help build credibility for the PBC to deliver low inflation consistently.

Moreover, we believe that the Chinese government should announce its intention to adopt a low long-run inflation target in the near future. The commitment to a long-run range would help lock in low inflation in China today. The government could add that it would expect the long-run inflation target to guide, rather than to constrain monetary policy actions in the short

run. The government could also commit itself to making the PBC operationally independent at some point in the future. It would be helpful if the government declared also that it does not intend to pursue exchange rate and fiscal policies in conflict with the agreed priority for low inflation.

Finally, the PBC should continue to improve its public assessments of current economic and financial conditions in China, its monetary policy communications, and its expression of concern for future economic conditions for the day when it is called upon to manage monetary policy independently. Establishing a familiar mode of communication with markets in advance will help the PBC to communicate its policy concerns and intentions clearly when China chooses to adopt independent monetary policy.[27]

Guidance for Policy: The PBC must have comprehensive, reliable, and timely statistics on money, banking, financial markets, and the macroeconomy in China to guide independent monetary policy. In the next revision of this paper, we plan to review in more detail whether such statistics already exist, whether new statistics are being produced, and whether they are deemed to be of sufficient coverage and reliability to guide independent monetary policy.

VI. Concluding Thoughts

Monetary policy can make an important contribution to macroeconomic stability in China. It is essential, first of all, that China have an independent monetary policy, which requires a flexible exchange rate regime. This still leaves open the question of what nominal anchor and monetary policy strategy would suit China best, taking account of weaknesses in the financial sector and other institutional constraints that exist at present. It is this question that we have attempted to address in this paper.

We have argued that an inflation targeting framework would provide a robust nominal anchor and constitute the best approach for Chinese monetary policy to anchor inflation expectations, thereby contributing to the stability of inflation and employment. Although there are many institutional weaknesses that hinder effective monetary policy transmission, we have argued that a minimal set of financial sector reforms would be sufficient for inflation targeting to work well. Indeed, this framework and the macroeconomic stability emanating from it would foster a more conducive environment for pushing forward financial sector reforms.

A monetary aggregate could be used as an operational target in the short run to maintain low inflation, but it would not serve well as a stand-alone anchor for monetary policy. Rapid changes in the structure of the economy could affect the relationship between specific

[27] The PBC issues quarterly monetary policy reports. In addition, the PBC recently released its first Financial Stability Report; this is expected to be an [annual] report.

monetary and credit aggregates on the one hand, and prices and economic activity on the other. Hence, using any such aggregate as the main nominal anchor would not be suitable.

Our objective in this paper was to make the case for inflation targeting at a conceptual level. We have touched upon, but not delved deep into a number of operational issues related to operating an inflation targeting regime. For instance, we have not discussed matters such as whether a point target or a range would be better, whether the target range should be narrow or broad, and what sort of communication strategy would be needed.

While these are important, the key issue, in our view, is to make low inflation the main priority for monetary policy. This proposition itself generates some obvious policy implications, including the need for central bank independence in order for monetary policy to be credible and effective. These institutional reforms would be necessary for monetary policy to help foster macroeconomic stability and thereby contribute to broader structural reforms in China, which are essential for sustainable long-run growth.

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