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Central bank financial strength and the cost of sterilization in China

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ABSTRACT

Using a unique monthly data set over the period 2000:1–2008:12, this paper presents empirical findings on China's central bank, the People's Bank of China, from the viewpoint of its financial strength and the cost of monetary policy instruments. The results show that PBoC is constrained by the costs of its monetary policy instruments. PBoC tend to use less costly but market-distorting instruments such as the deposit interest rate cap and reserve-ratio requirements, rather than more market-oriented but more costly instruments such as central bank note issuance. These costs remain under control today, but may rise in the future as PBoC accumulates more foreign assets. This, in turn, will jeopardize the Chinese monetary authority's capability to maintain price stability.

1. Introduction

It was first formally stated by Robert Mundell and Marcus Fleming, as a corollary of their Keynesian model of an open economy, that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement, and an independent monetary policy (Fleming, 1962; Mundell, 1960), known as the “Incompatible Trinity” (Rose, 2000). It's been more than four decades since their works were published; yet the predictive power of their pure-theoretical assertion becomes more and more recognized as one pillar of the Trinity – free capital movement – is strengthened by the more integrated global financial market. Central banks of countries with a liberalized capital account for the most part found it extremely hard to maintain a fixed or less fluctuating exchange rate while keeping track of domestic money supply at the same time. Their central banks tried to use open market operations to offset impacts of foreign capital inflows and outflows on domestic credit, but these attempts are often costly and unsustainable in the long run. Such attempts could lead to financial turmoil: interventions on exchange rate are widely considered as one of the causes of financial crises of Latin American countries during 1980s and that of East-Asian countries during late 1990s. In the end there aren't much choices left for the central banks, but either to let the exchange rate to free float and bear the fluctuations, or to give up monetary sovereignty by adopting a currency-board-alike regime, join a currency union, or go for dollarization.

China appears to be an outlier who hasn't suffered much from the pain of financial globalization. The US dollar/Chinese yuan exchange rate remained fixed for over a decade, e.g., 1994–2005. In 2005 the People's Bank of China (PBoC), announced they were abandoning the fixed exchange rate in favor of a managed float peg against a basket of currencies. Yet, the fluctuation of USD/CNY

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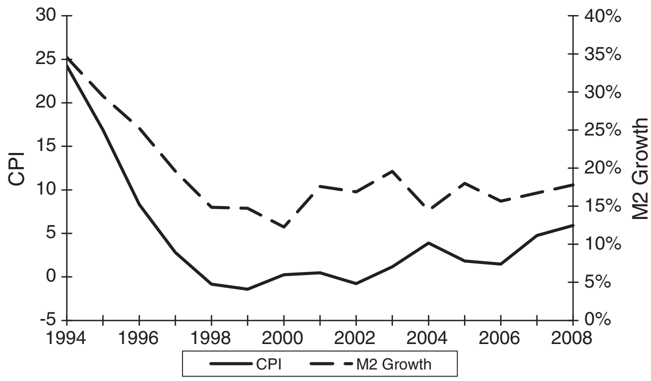

Fig. 1. China M2 growth and CPI, 1994–2008.

exchange rate is still minor by international standards. The PBoC have actively employed monetary policy instruments to manage domestic credit supply and maintain a stable price level. Fig. 1 presents China's broad money supply and consumer price index over the 1994–2008 periods. We note that PBoC successfully ended the hyperinflation of the mid-1990's and were able to keep a relatively stable level of inflation afterward, apart from a shorter period of deflation during the Asian financial crisis.

This leads us to the intriguing question of how China is capable of carrying out effective monetary policy while at the same time keeping the exchange rate fixed. To preview the answer, this paper shows that such ability to a large extent owes to the relatively low cost of PBoC's sterilization operations. Based on estimations from the publicly reported balance sheet of PBoC, we show that PBoC retained positive gains for every single year since 2000,[1] despite explosive international reserve accumulation in the same period. However, the sterilization capability was by no means achieved without cost.

We argue that the observed low cost of sterilization comes at the expense of a repressed domestic financial environment[2]. Because interest rate on CNY nominated assets was kept lower than the return on capital the market otherwise would demand, PBoC had to employ other market-distorting policy instruments, such as raising deposit requirements or even directly setting lending quotas on banks. By doing so, it could reduce the volume of excess liquidity that needed to be sterilized by central bank note issuance, and thus lower the total cost of sterilization. These measures hindered the financial market from working efficiently. Nevertheless, the pressure for PBoC becomes increasingly intense as current account imbalance persists and foreign capital inflow continues. A loss of international reserve due to appreciation on CNY also becomes a concern. These issues stated above, if not properly resolved, will undermine China's financial stability in the long run.

The remainder of the paper is organized as follows. The next section introduces the Chinese monetary authority: how it comes thus far, what is the current situation, and how it operates in this environment. Section 3 estimates the profitability of PBoC's operations from its assets and liabilities, and then estimates the different costs PBoC incurred when applying different policy instruments. We employ a model of central bank financial strength to illustrate PBoC's current situation and possible consequences in Section 4. Concluding remarks are given in Section 5.

2. Central banking in China

2.1. Starting from PBoC's balance sheet

A central bank is the monetary authority of a country. Usually a central bank acts as the primary provider of money and credit, the monitor and stabilizer of price and economic growth, and the lender of last resort in harsh situations, although the actual functions of them may differ from country to country. All functions of a central bank are reflected in the asset and liability holdings on its balance sheet. The balance sheet of a typical central bank is presented in Table 1. On the assets side, the central bank holds real asset (gold reserve), international reserves, and domestic assets. Domestic assets are either loans to financial corporations, or other kinds of debts (mostly government bonds). On the liabilities side, central bank issues currency and owes deposit reserves from domestic financial institutions. Some central banks also issue their own debts other than currency.

The balance sheet of PBoC follows the same structure, although it looks to be somewhat less typical in detail. Table 2 presents a simplified version of PBoC's balance sheet as of December 2008 (as compared to 1999).

The composition of PBoC's assets and liabilities changed significantly in the 10 year period. The worth-noting characteristics of PBoC's balance sheet in 2008 are as follows: (i) huge amount of foreign assets, accounting for approximately four-fifth of PBoC's total assets at book value. The ratio of foreign assets over currency issue is about 4.4:1, (ii) little government debts and even less other market debts, (iii) large deposit reserves. On Dec 2008 PBoC held RMB 9.2 trillion of deposit reserve from depository institutions, approaching half of its total liabilities. The large amount of deposit reserve is primarily because PBoC have repeatedly raised the deposit reserve requirement ratio since 2006 to slow down the growth of money supply, (iv) bond issuance. The

[1] Data is only available from this year.
[2] See, Goodfriend and Prasad (2007) for similar conclusion.