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Navigating the trilemma: Capital flows and monetary policy in China☆

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ABSTRACT

In recent years China has faced an increasing trilemma—how to pursue an independent domestic monetary policy and limit exchange rate flexibility, while at the same time facing large and growing international capital flows. This paper analyzes the impact of the trilemma on China's monetary policy as the country liberalizes its good and financial markets and integrates with the world economy. It shows how China has sought to insulate its reserve money from the effects of balance of payments inflows by sterilizing through the issuance of central bank liabilities. However, we report empirical results indicating that sterilization dropped precipitously in 2006 in the face of the ongoing massive buildup of international reserves, leading to a surge in reserve money growth.

We also estimate a vector error correction model linking the surge in China's reserve money to broad money, real GDP, and the price level. We use this model to explore the inflationary implications of different policy scenarios. Under a scenario of continued rapid reserve money growth (consistent with limited sterilization of foreign exchange reserve accumulation) and strong economic growth, the model predicts a rapid increase in inflation. A model simulation using an extension of the framework that incorporates recent increases in bank reserve requirements also implies a rapid rise in inflation. By contrast, model simulations incorporating a sharp slowdown in economic growth such as that seen in late 2008 and 2009 lead to less inflation pressure even with a substantial buildup in international reserves.

1. Introduction

The trilemma paradigm of open economy macroeconomics asserts that a country may not simultaneously target the exchange rate, run an independent monetary policy, and allow full capital mobility.[1] In the mid to late 1980s most developing countries addressed the trilemma by maintaining a combination of exchange rate stability and monetary independence, with relatively closed capital accounts. In the late 1980s and early 1990s, some developing countries, such as

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[1] See Obstfeld, Shambaugh, and Taylor (2005) for further discussion and references dealing with the trilemma. Related papers have raised the possibility that a pegged exchange rate is a trap in the era of greater financial integration (e.g., Aizenman & Glick, 2008a; Eichengreen, 1999; Edwards & Levy-Yeyati, 2005; Frankel, 1999).

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Mexico, Thailand, and Korea, embraced growing financial liberalization and openness. However, as they opened more financially, many of these countries also tried to maintain some degree of exchange rate stability and monetary independence, and failed to successfully navigate the trilemma. Their inconsistent policy goals resulted in severe financial crises, in Mexico during 1994–95 and in Asia during 1997–98. In the early 1990s Argentina adopted another trilemma configuration involving exchange rate fixity, supported by a version of a currency board, and complete financial integration. Argentina also experienced a crisis when ceding monetary policy independence to a currency board arrangement was no longer viable.

China has pursued a more cautious path towards greater financial openness. Although tax benefits and other incentives have been used to promote inward foreign direct investment, other forms of inflows, particularly portfolio capital and external debt, have been traditionally discouraged. Capital controls have also played a role in protecting the banking system from external competition by restricting the entry of foreign banks and by making it harder for capital to flow out of the country. The limited development of debt and equity markets in the past preserved the role of the state-owned banking system as the main international intermediary for Chinese borrowers and savers.

As China slowly liberalizes its capital account, it faces a key challenge of maintaining domestic monetary and price stability.[2] To avoid the trilemma problem, China has allowed somewhat more exchange rate flexibility in recent years. But growing balance of payments surpluses through both the current and financial accounts have put upward pressure on the currency. To limit appreciation of the domestic currency, the renminbi (Rmb), Chinese monetary authorities have intervened in the foreign exchange market and accumulated massive amounts of foreign reserve. As a result, China's holdings of foreign reserves have risen from $140 billion in 1997 (15% of GDP) to over $1.5 trillion at the end of 2007 (more than 45% of GDP), with two-thirds of this buildup occurring in the last three years.

This reserve buildup has raised concerns about monetary and inflation stability in China, as both money aggregates and prices have grown faster. A not-so-distant memory is the excessive expansion of the monetary base, money, and credit between 1991 and 1994 – when these aggregates grew at times by over 40% per annum – resulting in high inflation, with CPI rising near 30% at its peak.[3] The current foreign reserve boom lead to similarly large increases in the monetary base in 2007 and the first half of 2008, threatening a return of higher inflation. In 2007 the monetary base grew over 30% and CPI inflation rose above 8%.[4]

As long as China continues to place a higher priority on exchange rate stability than on using monetary policy as a tool for macroeconomic control, China's scope for an autonomous monetary policy is constrained. Chinese monetary authorities have addressed this challenge by more aggressive open market sterilization operations as well as by raising reserve requirement ratios and employing window guidance measures when concern about overheating was paramount. The extent to which China will successfully confront the trilemma problem depends on achieving the right balance of policy objectives. As reserve accumulation continues, the conflict between monetary and exchange rate objectives will become increasingly harder to resolve, particularly as remaining controls on capital flow become more difficult to maintain.

In this paper we investigate the extent to which the rise in China's foreign reserves has affected the country's monetary policy and been a source of monetary instability contributing to higher inflation. We begin by characterizing the nature of China's balance of payment flows and the effectiveness of its capital controls. We find that pressure on China's exchange rate regime increased after its ascension to the World Trade Organization in 2001 and the emergence of growing current account surpluses. These surpluses, together with large long-standing inflows of foreign direct investment, have presented China's authorities with a structural imbalance in the country's balance of payments. This imbalance, combined with bouts of "hot money" capital inflows spurred by speculation on Rmb appreciation against a backdrop of greater capital account openness, the People's Bank of China (PBC) to engage in ever-increasing foreign exchange market purchases and foreign asset accumulation to dampen appreciation of the currency.

The second part of our analysis measures the degree to which the PBC has been able to insulate reserve money growth from the liquidity effects associated with rapid foreign asset accumulation. We present estimates of how China's marginal propensity to sterilize the effects of foreign asset accumulation on the monetary base has changed over time, rising until 2006 and then sharply declining as the authorities found it increasingly more difficult to limit the liquidity effects of massive foreign exchange asset accumulation.

The third part of our analysis addresses the broader monetary and inflationary impacts of the foreign reserve buildup. We formulate and estimate a vector error correction model (VECM) characterizing the evolution of reserve money, broad money, real GDP, and prices. Although each variable individually appears to follow a stationary process in first differences, formal cointegration tests suggest that two long-term stable relationships (cointegrating vectors) characterize the system. We interpret these cointegrating relationships as long-run money demand and money supply functions. Estimates of the VECM model, which captures both short-run dynamics and long-term relationships in the data, allow us to carry out model simulations for alternative paths of foreign reserve accumulation and sterilization. Under a scenario of rapid foreign

[2] For example, China in recent years has permitted limited expansion of portfolio capital flows through "qualified investment" programs. Moreover, unofficial flows into and out of China have grown over time.

[3] This episode was also characterized by a sharp deterioration of asset quality, resulting in substantial increases in non-performing bank loans.

[4] Since much of this inflation has shown up as a sharp increase in food prices, attributable to food shortages caused by bad weather and livestock disease, some have argued that the recent inflation was not monetary in origin. Rogoff (2008) has described these alternative views as the "pork" versus "money" debate and states that "Those who believe that the cause of China's inflation is too little pork, rather than too much money, are seriously mistaken."