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journal homepage: [www.elsevier.com/locate/jme](http://www.elsevier.com/locate/jme)Capital controls and optimal Chinese monetary policy<sup>☆</sup>Chun Chang<sup>a</sup>, Zheng Liu<sup>b</sup>, Mark M. Spiegel<sup>b,\*</sup><sup>a</sup> Shanghai Advanced Institute of Finance (SAIF), Shanghai Jiao Tong University, China<sup>b</sup> Federal Reserve Bank of San Francisco, 101 Market Street, San Francisco, CA 94105, United States

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## ABSTRACT

China's external policies, including capital controls, managed exchange rates, and sterilized interventions, constrain its monetary policy options for maintaining macroeconomic stability following external shocks. We study optimal monetary policy in a dynamic stochastic general equilibrium (DSGE) model that incorporates these "Chinese characteristics". The model highlights a monetary policy tradeoff between domestic price stability and costly sterilization. The same DSGE framework allows us to evaluate the welfare implications of alternative liberalization policies. Capital account and exchange rate liberalization would have allowed the Chinese central bank to better stabilize the external shocks experienced during the global financial crisis.

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## 1. Introduction

China maintains a number of restrictions on its external sector. Its capital account is effectively closed, with tight restrictions on the access of domestic citizens to participation in international asset markets. China also maintains controls over fluctuations in its exchange rates. These restrictions, combined with China's open trade stance and large and persistent current account surpluses, pose challenges to the country's monetary policy. Under capital account restrictions, the People's Bank of China (PBOC, China's central bank) intervenes by purchasing foreign-currency revenues from exporters at prevailing exchange rates, with the purchases financed by either issuing domestic currency or domestic bonds. The portion of foreign asset purchases financed by selling domestic bonds is said to be "sterilized", in that it does not result in an expansion of money supply. Given this policy stance, PBOC holdings of foreign reserves have grown rapidly and China's monetary policy has become increasingly sensitive to global financial conditions (see Fig. 1).<sup>1</sup>

To study the implications of China's capital account restrictions for its monetary policy, we construct a dynamic stochastic general equilibrium (DSGE) model. In addition to limited access of private agents to international asset markets, the model features a number of other "Chinese characteristics" that mirror that nation's current unique policy stance, including a nominal exchange rate peg and sterilized central bank interventions.

Unlike the standard DSGE model, portfolio allocations for both the private sector and the central bank are a key part of our model's transmission mechanism and influence monetary policy decisions. To allow a role for portfolio decisions, the

<sup>☆</sup> The views expressed herein are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of San Francisco or the Federal Reserve System.

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<sup>1</sup> With rapidly growing foreign reserves, current account surpluses run by China may require increasingly intensive sterilization to maintain the government's exchange-rate goals (e.g., Glick and Hutchison, 2009).

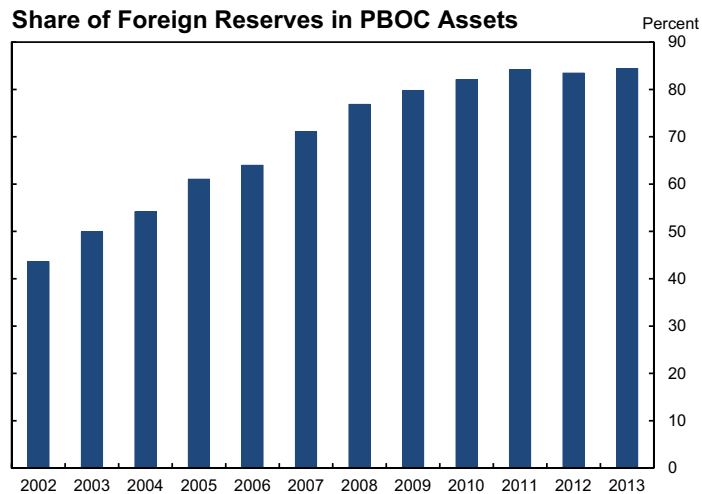


Fig. 1. China's foreign reserve accumulations.

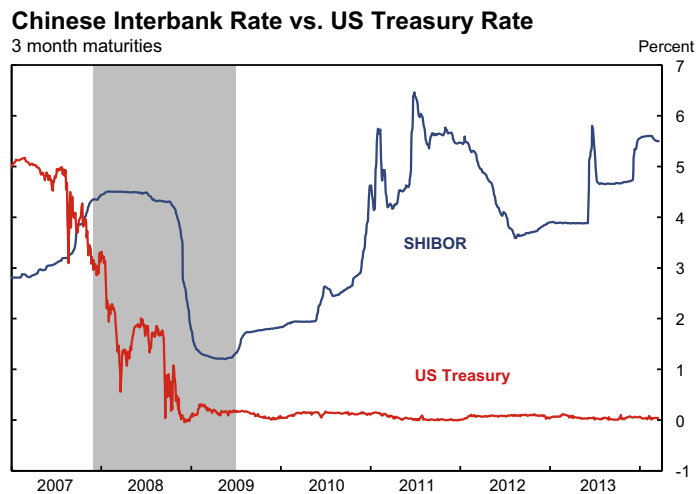


Fig. 2. China SHIBOR (Shanghai Interbank Offered Rate) vs. U.S. 3-month Treasury bills rate. The grey area indicates the Great Recession period in the United States.

model introduces a wedge into the uncovered interest rate parity (UIP) condition. The model is otherwise similar to the standard DSGE model with sticky prices and optimizing private agents.

The model is used to study optimal monetary policy, under which the central bank maximizes the representative household's welfare. A main finding is that, under the prevailing capital account regime, optimal monetary policy in China involves a tradeoff between sterilization costs and price stability.

Our analysis highlights the impact of this tradeoff for optimal Chinese monetary policy during the 2008–2009 global financial crisis. During that crisis, China faced persistent declines in foreign interest rates as the Federal Reserve and central banks in other advanced economies reduced short-term interest rates close to the zero lower bound and adopted quantitative easing and other unconventional monetary policies. In addition, sharp spikes of uncertainty in financial markets caused investors to shift their portfolio allocations toward low-risk and high-liquidity assets – such as U.S. Treasuries – in a “flight to liquidity”, pushing down yields on China's foreign reserves.

In contrast, nominal interest rates on China's domestic assets remained relatively high throughout the crisis period. Fig. 2 shows that 3-month Treasury rates were typically higher than China's domestic interest rates (such as the Shanghai Interbank Offered Rate or SHIBOR) before the global financial crisis. Since the crisis, however, the interest rate spread has reversed sign, with the Treasury rate falling to close to zero while the SHIBOR remained elevated. Thus, prior to the crisis, the PBOC enjoyed fiscal benefits from sterilization activity because it entailed exchanging low-yield domestic debt for

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