Comment

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This paper investigates how capital account policies can be used to devalue the real exchange rate. This is a critical topic given current policy discussions about the extent to which some economies are taking policy measures to maintain a persistent devaluation of the real exchange rate. In particular, the accumulation of international reserves by China and other emerging markets is at the center of these discussions.

Jeanne makes an important contribution to the literature by proposing a simple model to show how reserve accumulation can be effective in achieving a persistent devaluation of the real exchange rate. The starting observation that motivates the theory is that in a model where Ricardian equivalence holds, reserve accumulation should have no real effects as the private sector undoes the government policies. The model presented focuses on the role of government restrictions in the capital account to deliver real effects of reserve accumulation. The key intuition is that by restricting capital flows of the private sector, the government can force domestic savings, determine the current account, and hence affect the relative price of domestic goods.

I organize my discussion as follows. I begin by presenting a simplified two-period version of Jeanne's model. I use this framework to illustrate some of the key results of the paper. Then, I provide some comments. The main focus of my discussion is on whether capital controls are the main mechanism to rationalize the use of reserves as a policy tool. I conclude that the evidence is somewhat mixed and raise some open questions in the literature.

I.   Simplified Two-Period Model

The model I describe is a deterministic small open economy with two goods and two periods. There is a representative household with preferences given by the following utility function:

$$U = \log c_1^T + \log c_1^N + \beta(\log c_2^T + \log c_2^N),$$

where c^T and c^N are, respectively, tradable and nontradable consumption. Households start with no assets and receive a fixed endowment of tradables and nontradables. Hence, period 1 and period 2 budget constraints expressed in units of tradables are:

$$c_1^T + c_1^N p_1^N + b_1 + b_1^* = y^N p_1^N + y^T - T_1$$

$$c_2^T + p_2^N c_2^N = y^N p_2^N + y^T + b_1 R^d + b_1^* R^* - T_2,$$

where b_1 and b_1^* are, respectively, government and foreign bonds purchased in period 1 yielding R^d and R^* in period 2; T_t are lump-sum taxes.

The problem of the government is to choose reserves b_1^g and domestic debt d_1 subject to the budget constraints:

$$b_1^g = d_1 + T_1$$

$$b_1^g R^* + T_2 = d_1 R^d.$$

Market clearing in domestic asset markets and in the nontradable sector leads to the following result.

Result 1 (Ricardian Equivalence): Regardless of government policy, in the competitive equilibrium:

$$p_t^N = y^T y^N, \text{ for } t = 1, 2.$$

The intuition of this result is well known: if the government accumulates reserves, households borrow so that they keep the same consumption profile (i.e., $c_t^T = y^T$), and this leaves the real exchange rate unaffected. This is also the first-best in this economy. The fact that in equilibrium the real exchange rate is a monotonically decreasing function of the ratio of tradable-to-nontradable endowment leads to another classic result:

Result 2 (Balassa–Samuelsson): A boom in the tradable sector generates an appreciation of the real exchange rate (RER).

So far, the government cannot do anything to resist a real apprecia-

tion at $t = 1$ when tradable output increases by Δy^T, as Result 1 indicates. Jeanne provides the government an additional instrument to achieve the desired goal of undervaluation: capital controls. To see this clearly, set $b^* = 0$ in households' budget constraint; that is, the government does not allow households to trade financial assets with the rest of the world. Hence, in equilibrium, the government determines the trade balance and real exchange rate:

$$TB_1 = y^T + \Delta y^T - c_t = b_1^g, \quad p^N = \frac{y^T + \Delta y^T - b_1^g}{y^N}.$$

Result 3 (RER manipulation): By setting $b_1^g = \Delta y^T$, the governments prevents the appreciation of the RER in response to an increase of Δy^T in period 1 endowment of tradables.

Rather than closing the capital account for the private sector, the government can achieve the same outcome by taxing capital inflows so that the price of a bond becomes $1/(1 - \tau)$ and the tax on inflows is given by

$$\tau = \frac{2 - 2\bar{p}^N}{2 - \bar{p}^N}.$$

where $\bar{p}^N$ is the price of nontradables that the government seeks to implement (for $\beta = 1$, $R^* = 1$, $y^T = y^N$).

Result 4 (taxes on capital inflows): There is a one-to-one negative relationship between the real exchange rate and the tax on capital inflows.

This section completes some of the main results obtained by Jeanne.[1]

II.   Discussion

A.   *Capital Account Policies in China and the Rest of the World*

Jeanne's analysis focuses on China. This is natural because of widespread restrictions on capital accounts by the People's Bank of China. (Jeanne provides a battery of facts documenting capital account restrictions in China and the evolution of these policies until the global financial crises). A look at the data, however, shows that there are many economies that accumulate a large amount of reserves but at the same time have a relatively open capital account.[2] This raises the following question: Why are economies where reserve accumulation is supposed to be less effective, as Result 1 indicates, accumulating more reserves?

My own view is that there might be other fundamental reasons that

can allow reserves to have real effects beyond the use of capital controls. One fundamental reason could be financial frictions. Going back to the model, suppose households face a borrowing constraint, such that $b \geq 0$. In this context, it follows that reserve accumulation alone is fully effective even if capital controls are not at the disposal of the government. Intuitively, households cannot undo official asset accumulation because they face constraints on borrowing. Of course, whether financial frictions are sufficiently binding to make reserve accumulation effective in a fully dynamic model with a plausible calibration is a quantitative issue.[3]

Going back to China, it is also well known that in the past, China has used restrictions on purchases of foreign assets by residents. This policy works in the direction of appreciating the real exchange rate, which does not fit with the idea that China uses capital account policies to resist an appreciation of the real exchange rate. A thorough analysis of this issue requires incorporating gross capital inflows and gross capital outflows into the picture.

B.   On the Need of Reserve Accumulation

Putting Results 1 and 4 together produces a curious finding: reserve accumulation becomes irrelevant once the appropriate tax on capital inflows is put in place. That is, by setting a tax on purchases of domestic assets by nonresidents and a subsidy on resident purchases of foreign assets, the government can achieve the desired depreciation of the real exchange rate without using reserve accumulation. This observation raises the question: Why does the government in practice not rely *only* on capital controls to resist an appreciation of RER? I discuss two possible answers to this question.

One answer could be that official reserves matter per se—that is, the mix of government and private net foreign assets is important—beyond the desire to control the real exchange rate. In fact, reserves could play a role in defending the currency from speculative attacks in second-generation crises (Obstfeld 1986), reducing expropriation risk by the government (Aguiar and Amador 2011), or managing rollover crises when there is a possibility of sovereign default (Bianchi, Hatchondo, and Martinez 2012). An explicit modeling of these features involving both private and official capital flows is pending in the literature.

Another possible answer is that there are potential trade-offs associated with capital controls. For example, there could be deadweight

losses associated with attempts to evade those controls. Moreover, there is a notion of a stigma associated with the use of these capital controls.[4] Hence, if there are other channels that make reserve accumulation effective, as discussed earlier, reserve accumulation policies could dominate the use of capital controls. A thorough analysis of these issues, however, requires a model where capital account policies are optimal in the first place. For example, in Bianchi (2011), taxing capital inflows in good times corrects a pecuniary externality that makes the economy less vulnerable to reversals in capital flows in bad times, which in turn works to prevent a real appreciation in booms. Capital controls can also be optimal for regaining monetary independence in the presence of nominal rigidities (Schmitt-Grohé and Uribe 2012; Farhi and Werning 2012). Furthermore, the government may actually find it optimal to target a higher long-run real exchange rate due to growth externalities in the tradable sector (Korinek and Servén 2011).

III. Concluding Remarks

Jeanne has written an excellent and stimulating paper. The paper tackles a highly relevant policy question: How can an economy achieve a persistent depreciation of the real exchange rate through reserve accumulation? While policy discussions often take for granted that reserve accumulation has effects on the real exchange rate, the literature lacked a simple model that could illustrate the mechanism. Jeanne provides an important contribution to the literature by offering a clean and elegant model to show how reserve accumulation combined with capital controls can achieve a persistent undervaluation.

Future research could investigate further other reasons why reserve accumulation appears to matter in practice. Given current economic developments, this topic is of special relevance.

Endnotes

1. Another important result in Jeanne's paper is the derivation of an approximation to the welfare losses of capital account policies.
2. In fact, this is related to the empirical regularities associated with the so-called "allocation puzzle": (e.g., Gourinchas and Jeanne 2011; Aguiar and Amador 2011) (a) economies that grow faster experience capital outflows; (b) international reserves are the dominant force behind the pattern of capital flows; and (c) fact (a) is stronger in economies with a less restricted capital account.

3. See Benigno and Fornaro (2012) for recent work incorporating private and official capital flows in a model where financial frictions break Ricardian equivalence.

4. There seems to be, however, a shift in the general view (Ostry et al. 2010).

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