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Comments on "Reverse speculative attacks" by M. Amador, J. Bianchi, L. Bocola and F. Perri

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1. Introduction

Imagine the case of a Central Bank that wants to peg its currency to the Euro at some predetermined exchange rate. Imagine moreover that, at this exchange rate, there is an excess demand of domestic currency by foreigners. Conventional wisdom suggests that there is no problem whatsoever for the Central Bank to achieve its objective: all it needs to do is to expand the supply of domestic currency to accommodate whatever demand there is at the chosen exchange rate. In the process of doing so, the Central Bank will expand both its assets, i.e., foreign reserves, and its liabilities, i.e., domestic currency. Since the Central Bank can issue as much domestic currency as it desires, there is in principle no limit to the size of this policy intervention.

In this interesting paper, Amador, Bianchi, Bocola and Perri (henceforth ABBP) propose a model that illustrates the limits to this conventional wisdom. In particular, the authors identify a set of conditions under which the Central Bank may be forced to abandon the peg and let the currency appreciate. Their model is motivated by the recent experience of the Swiss National Bank (SNB), which in September of 2011 set a minimum value of the Euro/CHF exchange rate at CHF 1.20. In January of 2015, however, the SNB reversed this policy by abandoning the floor and letting the CHF appreciate substantially against the Euro. After presenting the theoretical model, ABBP calibrate it to Switzerland and show that it is able to replicate some basic features of the Swiss experience.

The paper provides a welcome addition to the literature on speculative attacks, which has hitherto been mostly concerned with the case of a Central Bank that wants to defend its currency against a *depreciation*. In this case, the conventional wisdom outlined above does not apply. It is still true that, if there is insufficient demand for the domestic currency at the chosen exchange rate, the Central Bank can intervene and purchase domestic currency with foreign reserves. There is a natural limit to this policy, however, which is given by the Central Bank's stock of reserves. This literature has greatly enhanced our understanding of the timing and manner in which speculative attacks take place, depleting the Central Bank's reserves and prompting the abandonment of a fixed exchange rates (e.g. Flood and Garber, 1984; Krugman, 1979; Obstfeld, 1986).

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Although ABBP's calibration exercise is interesting, I see the theoretical model as the main contribution of their paper. Thus, these comments focus on the model and its driving assumptions. Section 2 provides a brief description of the model and of its basic mechanism. I then provide a general discussion of this mechanism in Section 3.

2. The story

The model studies the problem of a small-open economy in which the welfare function of the Central Bank depends directly on the exchange rate. This can be interpreted as the reduced form of a broader model in which the Central Bank cares about unemployment or the level of economic activity, which depend in turn on the exchange rate. Initially, the Central Bank's welfare is maximized for some specific value of the exchange rate $S_t = \overline{S}$, where S_t is defined as the amount of local currency required to acquire one unit of foreign currency. I refer to this initial situation, in which the Central Bank sets the exchange rate to maximize a welfare function, as the *normal regime*.

There are two key assumptions that drive the model's results:

Assumption 1 (*Appreciation risk*). The Central Bank is expected to appreciate the currency. Formally, there is a probability in every period that the economy switches to an *alternative regime*. Once in this regime, the Central Bank sets an exchange rate $S_t = \underline{S} < \overline{S}$ forever.

Assumption 2 (*Loss constraint*). There is an upper bound on the balance sheet losses that the Central Bank can sustain *in any given period*.

Assumption 1 implies that, eventually, the economy will switch to the alternative regime and the Central Bank will appreciate the currency. When this happens, the institution will suffer a balance sheet loss because its liabilities are in domestic currency while its assets are in foreign reserves. The extent of this loss, in turn, depends on the size of the Central Bank's balance sheet. This is where Assumption 2 kicks in.

Suppose, for instance, that there is a surge in demand for domestic currency while the economy is in the normal regime. In order to keep the exchange rate at its desired level $S_t = \overline{S}$, the Central Bank needs to accommodate this additional demand by issuing domestic currency and exchanging it for foreign reserves. In doing so, however, it expands both its assets and its liabilities and thus magnifies the loss that it will sustain when the appreciation takes place. To the extent that this loss is limited by Assumption 2, therefore, so is the Central Bank's ability to sustain the exchange rate at its desired level $S_t = \overline{S}$. Once the size of its balance sheet reaches a critical threshold, the institution is forced to abandon the peg even before the economy switches to the alternative regime.

This is, in essence, the main result of the model: in the face of appreciation risk and loss constraints, there is a limit to the Central Bank's ability to defend the exchange rate against appreciation. ABBP then show how the recent experience of Switzerland can be interpreted through the lens of this result. To this end, they calibrate the model and introduce shocks to money demand and to the foreign interest rate, which are meant to respectively capture the increase in demand for Swiss Francs between 2007 and 2015 and the decline in Euro area interest rates during the same period. The interpretation of the paper is that both shocks expanded the demand for Swiss Francs, thereby requiring the SNB to expand its balance sheet in order to keep the Swiss Franc from appreciating. Given the underlying risks of appreciation, however, both shocks pushed the SNB closer to its loss constraint and ultimately led it to abandon its exchange rate policy – letting the Franc appreciate – in early 2015.

3. Comments

The strength of ABBP's model is that it captures a plausible mechanism in a simple and transparent manner. As I mentioned previously, this mechanism is directly driven by Assumptions 1 and 2. My comments therefore revolve around the role and interpretation of these assumptions.

My first set of comments refer to Assumption 1 on appreciation risk. The only reason for which the Central Bank lets the currency appreciate in this model is that it knows that it will eventually be forced to do so in the future. Thus, a first observation is that the model does not contradict the conventional wisdom outlined in the introduction: if the Central Bank wanted to indefinitely keep the exchange rate from appreciating, it could do so by issuing as much domestic currency as necessary. It is the understanding that there will be a regime switch in the future, which will force it to appreciate the currency, that makes it optimal for the Central Bank to allow for an appreciation even before the switch actually takes place.

This leads me to a second observation regarding appreciation risk: it is introduced in a very ad hoc fashion, as an exogenous shock that forces the Central Bank to appreciate the currency. Perhaps a more natural way of introducing this risk would be to assume that the Central Bank's welfare always depends on the exchange rate, but the optimal level of the exchange rate fluctuates with changing external and macroeconomic conditions. In the absence of balance sheet considerations, the Central Bank would set the exchange rate at its optimal level in every period. Once Assumption 2 is introduced, however, the institution might be forced to depart from this optimal level in order to avoid sharp appreciations that would lead to a violation of the loss constraint. This way of introducing appreciation risk would not only be more

natural, it would also be better at conveying the general message that underlies ABBP's model: in a world where Central Banks have large balance sheets and care about losses, exchange rates – and, more generally, monetary policy – are likely to be guided by both, macroeconomic and balance sheet considerations.

My second set of comments refer to Assumption 2 on loss constraints. ABBP assume that there is an upper bound on the losses that the Central Bank can sustain in any given period. An alternative assumption, which seems more natural from an economic perspective, is that there is a lower bound on Central Bank net worth. These different assumptions might lead to very different policy outcomes. Whereas the Central Bank in ABBP's model is concerned with avoiding large appreciations in any given period, a Central Bank that is guided by net worth considerations would instead be concerned by the cumulative appreciation taking place over many periods. The relative merits of these assumptions is ultimately a practical question, i.e., to what extent can Central Banks engage in intertemporal smoothing and use past profits to cover their losses?

Here, the recent work of Reis (2013a, 2013b) on Central Bank solvency is informative. Reis documents that it is common practice for Central Banks to rebate their profits to their respective treasuries, which limits their capacity to engage in intertemporal smoothing. This seems in line with ABBP's assumption. Having said this, some Central Banks – such as the Federal Reserve – apparently have accounting procedures that enable them to cover current losses with their past profits. It would be very useful to include a short discussion of these institutional rules when Assumption 2 is introduced, which could help the reader to interpret it in terms of existing Central Bank arrangements.

This seems especially important because, absent institutional or accounting constraints, it is not clear that the Central Bank in ABBP's model should be concerned about balance sheet losses that originate in exchange rate fluctuations. In the model, the Central Bank cares only about the level of the exchange rate. Intuitively, though, the institution's ability to sustain a given exchange depends on the amounts of domestic currency in circulation and of foreign reserves on its balance sheet, not on their relative value.

To illustrate this point, consider the case of a Central Bank that invests in Euro-denominated debt. If this debt is defaulted upon, the institution suffers a balance sheet loss and its net worth declines. This default also affects the institution's ability to set the exchange rate, moreover, because it reduces the amount of Euros held by the Central Bank for each unit of domestic currency in circulation. The situation seems fundamentally different if the domestic currency appreciates, however. The Central Bank still suffers a balance sheet loss, because its liabilities are in domestic currency whereas its assets are in Euros. But the appreciation changes neither, the amount of domestic currency in circulation nor the amount of Euros held by the Central Bank. Hence, it does not affect the Central Bank's ability to conduct exchange rate policy in any way. Why then, apart from institutional constraints, should the Central Bank care about such appreciation-related losses?

4. Conclusions

ABBP provide a simple, transparent model to understand why a Central Bank might choose to abandon a peg and let its currency appreciate. The model hinges on two simple assumptions regarding Central Bank behavior: (i) whatever it does today, it expects to eventually appreciate the currency in the future, and; (ii) it cares about balance sheet losses. Jointly considered, these two assumptions impose an upper bound on the size of the Central Bank's balance sheet, and thus on the extent to which it is willing to defend a peg against appreciation.

At a basic level, the paper provides a welcome addition to the literature on speculative attacks, which has been predominantly concerned with the case of a Central Bank that tries to defend its currency against a depreciation. But, more generally, it poses a crucial question at a time when the world's major Central Banks have large and expanding balance sheets: how do balance sheet considerations affect the conduct of exchange rate and monetary policy? The answer to this question depends crucially on the nature of these considerations. To what extent do they reflect institutional rules or political concerns? To what extent does a Central Bank's net worth really limit its ability to conduct policy? These questions are likely to be of paramount importance to understand Central Bank behavior in the coming years.

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