Foreign exchange dynamics and reserve accumulation under capital inflows

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Summary

When a currency's appreciation expectation cannot be offset by lower interest rates which have fallen to the zero lower bound, the monetary authority needs to intervene to prevent currency appreciation due to capital inflows and resulting in foreign reserve accumulation. Based on a standard flexible-price monetary framework, this paper extends a target-zone model in which the intervention policy is incorporated by specifying the asymmetric mean-reverting fundamental dynamics with the smooth-pasting condition at a moving boundary. The solution of the model shows that the exchange rate dynamics is more sensitive to the change in the fundamental when the domestic interest rate is constrained at zero, suggesting more intensive interventions required to counteract currency appreciation pressure. The empirical results using market data during January 2015 – February 2020 demonstrate that the model can describe the dynamics of the Swiss franc exchange rate following the mean-reverting square-root process. The accumulation of foreign reserves through interventions is negatively co-integrated with the exchange rate volatility and the value of the mean level of the Swiss franc exchange rate in the dynamics, to some extent indicating a reasonably high degree of effectiveness of the Swiss National Bank's interventions.