Monetary Policy and Long Term Relationships in the Singapore Exchange Rate: a Bayesian Approach

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The Monetary Authority of Singapore (MAS) uses the Managed Floating system (Williamson, 1999) as its main monetary policy instrument, such that the policy framework is centered on exchange rate of the Singapore dollar. Open emergent countries are usually seem as high risk and high return economies, and this specific view is generally reflected on the prices of its assets, which have a higher volatility in comparison with the assets of developed countries. For emergent economies on which the degree of openness is high relative to GDP, the exchange rate pass-through is usually higher and the inflation movements are mainly affected by Balance of Payments

shocks, which means that an exchange rate policy can be a better alternative to accommodate shocks on inflation. Singapore's case is unique around the world, due to the fact that their imports and exports were equivalent to 176.38% and 149.82% of the GDP in 2018, which justifies the use of the Managed Floating as their monetary policy system. In general, MAS's problem is to target inflation only through exchange rate policies, and the exchange rate intervention is their only instrument to control shocks of the market. According to the Monetary Authority of Singapore (2001), the system can be characterized in three key points. First, the Singapore's exchange rate is managed against the currency of its main trade partners and competitors. Second, the MAS targets the trade-weighted nominal exchange rate (SNEER) as its key anchor of monetary police. The SNEER is allowed to fluctuate within an undisclosed level and bands, which are announced semiannually to the market. Third, the exchange rate policy band and slope are periodically reviewed to remain consistent with economic fundamentals. Although many authors have written about Singapore's monetary system (Chia and Bauer (1995), Williamson (1998), Monetary Authority of Singapore (2001), Parrado (2004), Crowe and Meade (2007)) to our knowledge there hasn't been any prior work to make a rigorous econometric model to understand and predict short and long term relations in Singapore's exchange rate. With this unique problem at hand, we establish two main goals for this research. First, we seek to understand the long term mechanisms behind the Singapore equilibrium exchange rate. By modelling such mechanisms we are be able to gain information regarding MAS short term policy decisions, which are restricted to the slope and the band of the SNEER. Second, we build a forecasting model for the SNEER. To achieve the first goal, we rely on Bayesian Error Correction model to capture the long-term relationships between Singapore's and its main trade partners and competitors exchange rates, and for the second goal we make use of the fact that exchange rate data is available at a higher frequency than the SNEER to help our model to make nowcasts of the index and improve end-of-week predictions by adapting the mixed-frequency Bayesian model originally proposed by Ankargren et al. (2020) for dealing with data that presented monthly and quarterly frequencies. At last, we provide some insights

on how we can leverage our short and long-term predictions to build a systematic strategy to trade Singapore's exchange rate. We emphasize that the Bayesian inference framework is particularly suited for the problem at hand due to the amount of information available in the policy statements of the MAS and prior knowledge about Singapore's relationship with its main trade partners and competitors. By using a Bayesian multivariate time-series model we are able to leverage all this by encoding this information into the parameter priors.

Keywords: *monetary policy, exchange rate, bayesian models*

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