A Dynamic Bayesian Perspective
On How Developments In Global Liquidity Impact East Asian Currency Markets

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Abstract

The interrelationship of rapid domestic development in the context of rapidly developing global investment trends and shifts in global liquidity are changing the way East Asian currencies respond both to long-term trends and short-term, unexpected shifts in global liquidity factors. This paper seeks to explore certain ideas that relate changes in global liquidity to exchange rate determination and then to apply this analysis to East Asian currencies. This examination of global liquidity and East Asian currencies is designed to cover both longer-term trends as well as unexpected crisis periods characterized by liquidity shortages.

Following the development of the primary theoretical concepts, the research will the quantitatively examine the changing relative importance of global liquidity factors in the exchange rate determination process for East Asian currencies. By using a dynamic Bayesian approach, with time varying parameters, the changes in how global liquidity factors have impacted East Asian currencies over time will be highlighted. By coupling the theoretical concepts with insights from a dynamic Bayesian quantitative perspective, we hope to shed light on policy issues facing the central banks of East Asian countries as well as adding practical insights for portfolio and risk managers with exposures to East Asian currencies.

Theory. Currency substitution is a broad-based concept that focuses on the characteristics of currencies and how they fit into different types of investment portfolios and how they serve different purposes for trade and commerce. Currency characteristics include such items as the expected volatility of the currency, relative interest-rate policies, embedded inflation expectations, capital regulations effecting the cross-border flows of the currency, size of the underlying economy and domestic capital markets, use the currency in international trade and commerce, etc. On the investment side, the theoretical focus on currency characteristics highlights how one currency can (or cannot) substitute for another currency. As global liquidity factors change, either slowly as longer-term trends develop, or quickly as unexpected shortages occur, currencies with certain characteristics will find themselves prone to certain market impacts that will also change how they are correlated with other currencies and other investments.

For example, among portfolio managers, the currency market carry trade has often been fashionable. This investment strategy buys high-rate currencies with healthy domestic economies and sells low rate currencies to fund the position. The characteristic of having high short-term interest rates for sustained time periods (or vice versa for low interest rates) subjects these currencies to increased volatility should a global liquidity shock cause a shortage of liquidity. As a risky trade, predicated on significant leverage, any global event that causes a general shift toward risk aversion will naturally impact currencies involved in carry trades in a very different manner than currencies which did not exhibit the required characteristics for the trade.

Another example, has to due with the currency characteristics related to making them suitable in the foreign reserve portfolios of central banks. Price stability in terms of the currency, size of domestic and international commerce conducted in the currency, and longer-term policy stability are all characteristics than can shift the balance in the world of reserve currencies. In the current environment, since the formation of the Euro-zone, the Euro has evolved into a currency whose size of international commerce and policy stability have made it an extremely viable substitute for the US dollar in central bank portfolios. Moreover, currency substitution within the reserve currency world has huge implications for currencies that have historical ties with the reserve currency that is in decline or the reserve currency that is on the rise.

These are just two current examples of how a currency characteristic approach can shed light on how currencies will respond to changes in global liquidity and especially to sharp, short-term shifts in the availability of the liquidity and overall investor risk aversion. Our paper will explore a number of additional currency substitution and currency correlation issues critical to East Asian currencies.

Quantitative Analysis. What the theory of currency substitution makes clear is that the choice of the appropriate empirical tool to examine a dynamic situation as presented by the analysis of changing global liquidity conditions is critical. We have chosen to develop our empirical

examination using a dynamic Bayesian approach. The complexity of the theoretical issues suggest that a number of alternative approaches may also provide useful insights, so we merely want to inform the discussion with a Bayesian approach without precluding our use of other methods as needed. The dynamic Bayesian statistical approach we use allows for time varying parameters and the incorporation through dynamic seemingly unrelated regressions (SUR) to simultaneously estimate expected currency returns, volatilities and correlations.

The use of time varying parameters directly incorporates the theoretical concept that the relationship of global liquidity factors to exchange rate determination will change over time. That is, we do not expect an estimated beta coefficient related to a specific global liquidity factor to remain fixed over a long period of time. This suggests that quantitative methods based on traditional, fixed period regression equations are not necessarily the best choice for this analysis, even if one subdivides the period or uses recursive techniques. After all, our objective is to quantitatively track how global liquidity factors shift their influence over time, so the choice of a dynamic Bayesian statistical approach handles this extremely well.

Our theoretical work with currency substitution also points to shifting correlations as a critical element in understanding how a global liquidity shock will impact currencies differently depending on their characteristics. By integrating a dynamic SUR approach into a Bayesian system, we can quantitatively analyze how expected correlations and volatility evolve with the changing nature of global liquidity.

Conclusions. When applied to East Asian currencies, our theoretical concepts are illustrated in a dynamic Bayesian quantitative system that highlights a number of important portfolio management and central bank policy issues. First, the rise of the Euro as a viable competitor to the US dollar as a reserve currency changes the exchange rate dynamics for currencies based on their relative historical ties to the US dollar, and impacts currencies differently based on whether they are net importers or exporters of commodities traditionally denominated in US dollars. Second, countries in a strong and healthy growth phase will have to consider the portfolio management side-effects of sustained high interest rates, even if the domestic situation appears to require them. Here the issue is that healthy economies and sustained high interest policies attract investors in the currency carry trade. This, in turn, dramatically increases the potential volatility of the currency from global liquidity shocks that impact international investor risk aversion, whether there is any change in the domestic situation or not.

These are only a few examples of the concepts that will be explored theoretically and then illustrated empirically with our dynamic Bayesian approach. Our concluding section will try to establish a parallel between (a) a set of currency substitution issues facing global investors that are of special relevance to East Asian currencies, and (b) the complications these issues raise for the appropriate conduct of central bank policy. As will be shown, the long-term trends in global liquidity, such as the changing competition for reserve currency status, as well as understanding the global portfolio management implications of abrupt changes in global liquidity and risk aversion, are critical drivers of East Asian currency markets. All of this underscores the reality that certain East Asian currencies can react in very different ways to the same global events, which can only be described as a major complication for domestic policy. Hopefully, our research will provide some insights into possible policy solutions.

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