Understanding the common dynamics of the emerging market currencies ☆

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ABSTRACT

The aim of this study is twofold. First, we examine if there exists a common movement among the currencies of emerging markets that implemented flexible exchange rate regime after 2000. Second, we examine whether this comovement is closely related to financial market conditions and macroeconomic fundamentals in emerging market economies. Our findings suggest that currencies of the emerging market economies have a common movement, which we name as "Exchange Rate Index". We find that the Exchange Rate Index can be explained to a great extent by financial market indicators while macroeconomic fundamentals have relatively less power in understanding this common exchange rate pattern. The results particularly underline the importance of sovereign debt risk, equity return differentials and risk appetite. The relationship between financial variables and the Exchange Rate Index is significantly nonlinear, while the results for macroeconomic fundamentals do not show any nonlinearity.

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1. Introduction

After the recent global crisis, which strengthened the significance of global financial linkages, increased capital flows to and within emerging economies became a follow-up topic for policy makers and researchers, as these flows revived the agenda of macroeconomic risks. While developed countries were declaring quantitative easing measures, emerging countries started taking a number of preventive measures toward handling pressures on their exchange rates, protecting their competitiveness in global markets and keeping their current account movements stable. Within this study, we aim to document the commonalities in nominal exchange rates of emerging markets and investigate the driving forces of it, as the research on emerging market currencies is relatively scarce. Our study contributes to a body of research focusing on financial and macroeconomic background within the emerging market economies and their corresponding effects on exchange rate movements that became more prominent especially after the last global crisis.

In the 2000s, there have been dramatic changes in the exchange rate policies of emerging countries and the number of countries which prefer more flexible currency regimes increased considerably when compared to the 1990s. As more emerging countries have experienced the flexible exchange rate regime within the recent years, the importance of understanding exchange rate dynamics in these countries has increased significantly for policymakers, economists and investors. In this paper, we first show that the dynamics of exchange rates in emerging markets show a common pattern and we extract this common pattern using a dynamic factor model. We introduce this common factor as a composite index as in Stock and Watson (1989) and call it as the "Exchange Rate Index" for emerging market economies. To our knowledge, the research on the common dynamics of exchange rates is a very intact area.[1] The Exchange Rate Index that we extract explains a significant portion (nearly 60%) of the variation in currencies. In this way, the common dynamics can be followed as a fundamental pattern that will reflect the aggregated common currency movement for emerging countries and their common pattern can be studied in a unified manner. Next, we attempt to explain the dynamics of the Exchange Rate Index using the financial market conditions and macroeconomic

[1] There exist a couple of papers that are related to the common movement of exchange rates. One of them is by Engel et al. (2009) about forecasting the exchange rates of 17 OECD countries, and constructing factors from a cross section of exchange rates. The papers by Cayen et al. (2010) and Kempa and Wilde (2011) investigate the similarities and differences in the real exchange rate dynamics of several developed economy currencies. Aggarwal and Simmons (2008) examine the common stochastic trend among Caribbean currencies, but this study gives information about comovement between two pairs of currencies.

fundamentals of emerging economies relative to the US as the world economy. To this end, we employ exchange rate models derived from the theory and also apply univariate or multivariate econometric analysis when necessary.

Theoretical literature states that exchange rates are determined by fundamental variables. However, in international macroeconomics and finance literature, many econometric analyses show that there is a disconnection between exchange rate movements and macroeconomic fundamentals such as output, money supply, inflation and interest rates. The literature on the determinants of exchange rates have mainly focused on developed countries (Cayen et al., 2010; Engel et al., 2009; Kempa and Wilde, 2011; Wang and Wu, 2012). However, it has become widely accepted that empirical models using macroeconomic variables have notoriously limited success in explaining exchange rates for developed countries. Meese and Rogoff (1983), Obstfeld and Rogoff (2000) and Cheung et al. (2005) are among the leading papers showing this poor explanatory power of macroeconomic fundamentals. On the other hand, literature on the relationship between exchange rates and macroeconomic fundamentals are not all doom and gloom. Rapach and Wohar (2002) found support for a simple form of the long-run monetary model of exchange rate determination for a collection of 14 industrialized countries. Taylor and Peel (2000) also have supportive evidence for the relationship between exchange rates and macroeconomic fundamentals over the long run with respect to a nonlinear mean reversion toward the monetary fundamental equilibrium.

We begin our analysis on the determinants of the Exchange Rate Index by focusing on financial markets first and extend the analysis to the macroeconomic fundamentals of emerging economies relative to the world economy (the US economy). The financial markets in these economies have gained more attention over time to investigate the determinants of exchange rates, as the implementation of more flexible regimes within the last ten years made it possible to analyze the effects of financial markets and capital flows on currency movements without any intervention effect in a healthy manner, and the topic gained its well-deserved prominence after the recent global crisis. In addition to that, there is a huge gap in the exchange rate literature about the employment of financial variables to apprehend the emerging market exchange rates.[2] With this paper, we try to fill this gap showing that the Exchange Rate Index is highly linked to the sovereign debt risk, differentials of equity returns between the emerging markets and the US, and investor risk appetite. This relationship is strengthened considerably with the use of nonlinear estimation methods.

We then employ exchange rate models built for macroeconomic fundamentals in the literature; that is, purchasing power parity model and sticky price model. Showing that both exchange rate models do not exhibit nonlinearity, we conduct a factor-augmented vector autoregression (FAVAR) model to study the implications of the purchasing power parity and sticky price assumptions in a multivariate manner. Similar to most papers in the literature, our preliminary analyses with macroeconomic fundamentals fail to explain the exchange rate dynamics. However, when univariate analysis is replaced with multivariate analysis and endogeneity is taken care of, both models can explain the Exchange Rate Index to some extent, though not as strong as financial variables, and the tests show no substantial nonlinearity between the macroeconomic fundamentals and the Exchange Rate Index.

In Section 2, we introduce the exchange rate database used in our paper. In Section 3, we introduce a dynamic factor model with the aim of extracting the common movement of selected emerging market currencies that we name Exchange Rate Index. In Section 4, we examine the link between the Exchange Rate Index and the financial variables. In Section 5, we run a similar analysis to that used in Section 4, only this time using macroeconomic fundamentals. The final section concludes.

2. Database of selected emerging market currencies

Before investigating the common dynamics of emerging market currencies, it is essential to examine and understand the exchange rate regimes of the emerging countries in question. The reason for such an inquiry is that; during times of increased risk appetite, an emerging country with a flexible exchange rate regime can experience appreciation due to increased capital inflow. However, the same exchange rate movement will not be observed in an emerging country with a fixed exchange rate regime. Moreover, currency movements of an emerging country within fixed regimes can move in different ways, compared to other countries with flexible exchange rate regimes in case of increased risk appetite environment. Therefore, emerging countries that have been included in our study are chosen according to their exchange rate regime. Emerging countries with flexible exchange rate regimes are chosen for a healthy analysis.

Determination of exchange rate regimes has been accomplished by using a "de facto" exchange rate classification scheme produced by the International Monetary Fund (IMF)[3]. The classification in question is composed of eight course classes where a number is assigned for each course. In this framework, number one refers to most rigid exchange rate regime, where the most flexible regime is represented by number eight, and the numbers in between one to eight represent exchange rate regimes with different ranges of rigidities.[4] Before estimating and analyzing the common movements of emerging market currencies, we examine the exchange rates of thirty countries and chose fourteen among them that have relatively more flexible exchange rate regimes. Between the years 1990 and 2000, selected fourteen emerging market countries mediated their currency markets quiet often. Therefore, for the 1990–2000 period, it is hard to decompose the effects of intervention from currency movements for analyzing the effect of financial or macroeconomic fundamentals on the dynamics of exchange rate movements alone. Thus, we leave that period out of analysis when we were conducting our study. On the other hand, there have been slight interventions to exchange rate markets after the second quarter of 2009, during the time when emerging market countries were aiming to take some measures to control short term capital flows. This slight intervention is more observable within 2010, when the emerging market currencies started to appreciate with increased capital inflows. However, these interventions are not as strict as those in the 1990–2000 period.

Fig. B.1 illustrates the evolution of the selected fourteen emerging countries' currencies after 2000. Nominal exchange rate data against the US Dollar is monthly averages from Bloomberg database starting from January 2000 and ending in August 2014. All the definitions for the series used in this research is at Table A.1. Table A.2 reports descriptive statistics of raw nominal exchange rates. The database used in Fig. B.1 has been standardized due to a significant scale difference between the emerging economies.

3. Common movement of emerging market currencies: Exchange Rate Index

There is an extensive literature on the determinants of exchange rates, which has mainly focused on developed countries. However, the literature has scarce analysis on exchange rates of emerging economies

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[2] Linkages between financial variables and exchange rates have been examined in economic literature by various papers. For example, Pan et al. (2007) summarize the theoretical and empirical literature on the relationship between exchange rates and stock prices in detail. However, there does not exist a clear empirical paper that finds a significant contemporaneous relationship between exchange rates and stock prices. Existing literature basically use stock prices as one of the main financial variables to explain the exchange rate movements. Unfortunately, this literature is rather weak for analyzing the building blocks between significant financial fundamentals and exchange rate dynamics.

[3] See Bubula and Ötker (2002) for details.
[4] The information was retroactively updated by A. Bubula and I. Otker-Robe, "The Evolution of Exchange Rate Regimes since 1990: Evidence from De Factor Policies," IMF WP/02/155. The official definitions of the categories are available at: http://www.imf.org/external/np/mfd/er/index.asp.