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Axel Jochem and Stefan Reitz\*

# The Impact of Global Factors on Stock Market Movements in Emerging Market Economies

Global factors are becoming increasingly important as a cause of international capital flows. It is nearly impossible for some countries to protect themselves from outside influences on their financial markets. This paper investigates the extent to which various global factors such as stock market volatility, international liquidity and global interest rate levels impact on the effective financial market exchange rates of selected emerging market economies. These results are compared with effects on the financial market exchange rates of the United States, the United Kingdom and Germany.

Gross capital flows between highly advanced economies and emerging market economies (EMEs) have grown considerably more volatile in the aftermath of the international financial crisis. An initial period of capital flows to advanced economies, then regarded as “safe havens”, beginning in mid-2011 was followed by a considerable portion of the extremely ample liquidity in the United States and Europe provided under their central banks’ quantitative easing programmes migrating to Latin American and Asian EMEs in search of yield. This led to a real appreciation of local currencies, felt in some quarters to be unwanted, along with a loss of real competitiveness. The US Federal Reserve’s announcement in May 2013 that it would start “tapering” its purchases of government bonds, as well as the actual beginning of tapering at the end of that year, caused considerable quantities of capital to return to the United States from EMEs. The associated price adjustments in the EMEs’ stock and forex markets were repeatedly described as a new currency crisis or emerging markets crisis. This prompted a debate on the local and global causes of this development.<sup>1</sup>

The relevant literature stresses that global factors are becoming increasingly important as a cause of international capital flows. It is nearly impossible for some countries to protect themselves from outside influences on their financial markets. Rey even raises the spectre of a paradigm shift.<sup>2</sup> She suspects that the classical “trilemma” of a country being able to realise only any two of the goals of exchange rate stability, independent monetary policy and free movement of capital has been superseded by a “dilemma” of – irrespective of the exchange rate regime – independent monetary policy being possible only if capital controls are instated. Forbes and Warnock had noted earlier that domestic, local factors were increasingly being dominated by global factors as determinants of extreme capital movements.<sup>3</sup> Turner cites as an explanation of increased interdependence the closer international interest rate network promoted by cross-border refinancing operations conducted by globally operating credit institutions and by forex swaps.<sup>4</sup> Chung et al., however, focus more on global liquidity, the impact of which affects, first and foremost, the financial markets of EMEs.<sup>5</sup>

This paper investigates the extent to which various global factors such as stock market volatility, international liquidity and global interest rate levels impact on the effective fi-

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1 See, for instance, *The Economist*: More Emerging Market Jitters: Midnight Run, 29 January 2014.

2 H. Rey: Dilemma not Trilemma: The Global Cycle and Monetary Policy Independence, Federal Reserve Bank of Kansas City Proceedings, 2013.

3 K.J. Forbes, F.E. Warnock: Capital Flow Waves: Surges, Stops, Flight, and Retrenchment, in: *Journal of International Economics*, Vol. 88, 2012, pp. 235-251.

4 P. Turner: The Global Long-term Interest Rate, Financial Risks and Policy choices in EMEs, BIS Working Papers 441, 2014.

5 K. Chung, J.E. Lee, E. Loukoianova, M.H. Park, M.H.S. Shin: Global Liquidity through the Lens of Monetary Aggregates, IMF Working Paper 14/9, 2014.

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**Table 1**  
**The impact of global financial market factors and domestic reserve assets on the effective financial market exchange rates of selected EMEs**

	<i>refer</i> <sub>t-1</sub>	<i>vix</i>	<i>liq</i>	<i>int</i>	<i>res</i> <sub>t-1</sub>	R <sup>2</sup>
Argentina	0.351 (3.55)***	-0.060 (-1.73)*	0.707 (2.25)**	0.023 (0.47)	0.02 (1.15)	0.25
Bulgaria	0.312 (3.27)***	-0.028 (-0.91)	1.066 (3.77)***	0.008 (0.19)	0.052 (0.70)	0.31
Brazil	0.285 (2.58)**	-0.061 (-1.93)*	0.588 (2.24)**	-0.022 (-0.60)	-0.174 (-1.14)	0.21
Czech Republic	0.064 (0.66)	0.000 (0.001)	0.905 (4.79)***	-0.090 (-3.02)***	-0.077 (-0.54)	0.22
Hungary	0.015 (0.16)	-0.061 (-2.21)**	1.212 (5.33)***	-0.009 (-0.25)	0.257 (2.47)**	0.34
Indonesia	0.124 (1.19)	-0.069 (-1.90)*	0.957 (2.98)***	-0.116 (-2.34)***	0.405 (1.91)*	0.24
India	-0.002 (-0.09)	-0.059 (-1.73)*	0.645 (1.98)**	-0.087 (-1.88)*	0.064 (0.22)	0.06
Korea	0.126 (1.13)	-0.032 (-1.76)	0.416 (2.36)**	0.006 (0.26)	-0.164 (-0.75)	0.10
Mexico	-0.095 (0.92)	-0.065 (-3.48)***	0.500 (3.08)***	-0.049 (-1.96)*	-0.146 (-1.07)	0.18
Poland	-0.141 (-1.44)	-0.022 (-0.96)	0.968 (4.68)***	-0.040 (-1.27)	0.148 (1.19)	0.23
Romania	0.267 (0.60)*	0.010 (2.62)	1.137 (3.54)***	-0.004 (-0.073)	0.029 (0.14)	0.20
Russia	0.196 (1.69)*	0.001 (0.04)	1.394 (4.32)***	0.025 (0.55)	-0.104 (-0.48)	0.28
Singapore	0.093 (1.26)	-0.027 (-2.21)***	0.322 (3.05)***	-0.018 (-1.11)	0.216 (1.69)	0.24
Thailand	-0.005 (-0.40)	-0.046 (-1.72)*	0.290 (1.31)	-0.133 (-3.69)***	0.321 (1.47)	0.14
Turkey	0.193 (1.86)*	-0.132 (-2.69)***	1.089 (2.56)**	-0.166 (-2.46)**	-0.248 (-0.70)	0.18
South Africa	0.127 (1.25)	-0.097 (-2.78)***	0.913 (2.98)***	-0.137 (-2.81)***	-0.243 (1.51)	0.18

Notes: All variables are log differences except for the interest rate (difference); t-values in parentheses; \*\*\*/\*\*/\* denotes statistical significance at the 10%/5%/1% level.

financial market exchange rates of selected EMEs.<sup>6</sup> Because these rates are defined as a ratio between the price of domestic stocks and the weighted average price of all domestic stocks expressed in a single currency, a significant influence of a global variable indicates an asymmetric effect inasmuch as the EME in question is affected more severely than the average of all countries. This will always be expect-

6 As a counterpart to real effective exchange rates in the goods markets, effective financial market exchange rates measure the value of domestic financial instruments, especially stocks, in an international comparison. For a detailed description of how to calculate effective financial market exchange rates and of their properties, see Deutsche Bundesbank: Effective Exchange Rates from Financial Market Data, Monthly Report, April 2011, pp. 17-34.

ed if the financial markets in the affected EMEs have a low market depth. Foreign reserve holdings are included as an added domestic control variable. This variable could play a role inasmuch as forex market intervention or the exchange rate regime impact on the response of nominal exchange rates and thus also on the changes in financial market exchange rates. These results are then compared with effects on the financial market exchange rates of the United States, the United Kingdom and Germany.

## Data

We study the impact of global factors on the financial market exchange rates of 16 EMEs and three industrial countries over the period from the beginning of 2006 to the end of 2013. In order to calculate the effective financial market exchange rates (*refer*) we use MSCI stock market indices obtained from Datastream Thomson Financial as well as bilateral exchange rates against the euro (Deutsche Bundesbank) and bilateral securities holdings between partner countries (IMF: Coordinated Portfolio Investment Survey). The volatility index VIX (*vix*) is calculated and made available by the Chicago Board Options Exchange (CBOE) for the S&P 500 stock index. The M2 monetary aggregate serves as a global liquidity measure (*liq*). The data are provided by the Deutsche Bundesbank and the Bank for International Settlements (BIS). The average long-term interest rates (government bonds with a residual maturity of ten years) for the euro area, the United Kingdom, Japan and the United States are used to approximate the global interest rate level. Holdings of reserve assets (including gold) are taken from the IMF's International Financial Statistics. Since the estimates are based on monthly data, there is a sufficient quantity of observations to conduct these estimations separately for each country; as opposed to pool estimates, this enables us to detect country-specific differences. The estimates were performed using WinRats Standard 8.2 as ordinary least squares (OLS) regressions with an autoregressive term of the dependent variable. The financial market exchange rates and the *vix*, *liq* and *res* variables are in log differences. In order to solve the endogeneity problem of this domestic variable with the domestic financial market exchange rate, we have used lagged, i.e. predefined, variables. Simple differences have been used for the interest rates.

## Results of the estimation

By construction, a rise in real effective financial market exchange rates implies a relative increase in the price of a country's stocks compared to the weighted average of the stocks of all other countries. A significant impact of global factors on the financial market exchange rate of an emerging economy thus documents an asymmetrical effect in that the EME in question is affected more severely than the aver-

age of all the countries. This is always to be expected if the domestic financial market is less liquid than the average of financial markets and – ceteris paribus – is correspondingly more highly volatile. If, for example, an expansion of global liquidity actually does lead to a shift in international portfolios away from investment in industrial countries, then, conversely, an equal negative effect should be detectable for this group of countries. Whereas the following section contains the estimation results for 16 EMEs, the one after focuses on the estimation results for the most important industrial nations.

### Basic model

Table 1 summarises the results of the estimation. The estimate illustrates that global liquidity, in particular, applies considerable upward pressure on the EMEs' relative financial market prices, measured by the effective financial market exchange rates.

In 15 of 16 countries, this impact is statistically significant.<sup>7</sup> This contradicts the traditional hypothesis that country-specific differences in stock prices are determined by the profit outlook in the country concerned. Therefore, relative prices appear to be determined not just by the quality and the scope of alternative investment vehicles in the relevant EME but also by the terms and conditions of the (global) supply of capital. This is all the more remarkable considering that this impact occurs regardless of whether the country maintains flexible exchange rates or has attempted to manage the value of its currency through forex market intervention or artificially setting exchange rates altogether.<sup>8</sup> In line with the more recent literature, the advantages of flexible exchange rates for shielding an economy from external (global) factors appear, therefore, to be called into question.

As expected, the correlation of EMEs' financial market exchange rates with uncertainty on the US stock market and global interest rates levels will tend to be negative; there are five cases for each type of correlation where statistical significance can be identified. Domestic reserve assets, by contrast, do not appear to be ideally suited to stabilising the domestic financial market exchange rate. Only in one case (Hungary) do they exert a statistically significant impact on the movement of the financial market exchange rate. All in all, this confirms the volatility-heightening impact of global liquidity on the financial markets in EMEs.

<sup>7</sup> In this article, statistical significance means that the probability of a first-order error is less than five per cent.

<sup>8</sup> The countries in the data set represent a broad spectrum of currency arrangements. In line with the IMF classification, these countries reported their exchange rate arrangements as "free floating", "floating", "crawl-like arrangement", or "currency board".

**Table 2**  
Impact of global financial market factors on selected countries' effective financial market exchange rates

	<i>refer</i> <sub>t-1</sub>	<i>vix</i>	<i>liq</i>	<i>int</i>	R <sup>2</sup>
Brazil	0.260 (2.40)**	-0.058 (-2.08)**	0.560 (2.09)**	-2.050 (-0.54)	0.21
Korea	0.105 (1.01)	-0.033 (-1.80)*	0.403 (2.40)**	0.08 (0.03)	0.12
Mexico	-0.123 (-1.24)	-0.061 (-3.35)***	0.496 (3.09)***	-4.793 (-1.920)*	0.17
Singapore	0.163 (1.68)*	-0.042 (-3.36)***	0.372 (3.34)***	-3.352 (-1.97)*	0.26
Germany	0.102 (1.02)	-0.014 (-1.39)	0.318 (3.54)***	1.323 (0.931)	0.20
UK	-0.070 (-0.82)	0.008 (1.28)	0.376 (7.08)***	0.377 (0.44)	0.34
US	0.075 (0.78)	0.003 (0.40)	-0.478 (-5.92)***	0.413 (0.34)	0.34

Notes: All variables are log differences except for the interest rate (difference); t-values in parentheses; \*\*\*/\*\*/\* denotes statistical significance at the 10%/5%/1% level.

### Differences between EMEs and industrial countries

In order to study potential differences between industrial countries and EMEs with respect to how their financial market variables respond to global factors, the estimates were also performed for Germany, the United Kingdom and the United States, but without explicitly containing reserve assets, which in industrial countries do not play a role comparable to that in EMEs.<sup>9</sup> This is particularly true for the United States in its role as the issuer of the US dollar, which is still the most important currency for international financial transactions, and for Germany as a eurozone member. In order to render the estimation results directly comparable with the studies for EMEs, the same regression was also performed for four leading EMEs. Table 2 presents the results.

We see that the prominence of global liquidity over other global factors such as stock price uncertainty and interest rates is much more marked for industrial countries than for the EMEs.

Moreover, especially in light of the current debate on "tapering", it is interesting to note that the relationship be-

<sup>9</sup> However, it must be noted that for industrial countries – unlike within the group of EMEs – global factors cannot be cleanly distinguished from, but are, by construction, influenced to a major degree by, domestic factors. The most prominent example is the *vix*, which is explicitly calculated according to the expected movements in the price of US stocks.

tween global liquidity and the effective financial market exchange rate is significantly negative for the United States, and therefore the opposite of the relationship for all other countries. Apart from the fact that the construction of the financial market exchange rate requires such a mirror image in at least one other country, this underscores the special role played by the United States for the global financial markets. This was not altered by the international financial crisis, which originated in the United States. Whereas the provision of extremely ample liquidity in the major economies needs to be seen in the context of the slumping economy in the industrial countries and the problems besetting the financial sector, yield-seeking international investors – after initially putting their money in safe havens – then headed elsewhere, including the relatively unaffected EMEs. Irrespective of local conditions, these dynamics expose EME financial markets to additional volatility, to which policymakers in many places responded by imposing capital controls.

The answer to the question of whether the Fed's tapering will make a return to normality possible or harbours the danger of a renewed financial crisis will depend to a major extent on the EMEs' macroeconomic stability and their ability to withstand exogenous shocks. In any event, the experience of the past few months and years has shown that is virtually impossible to isolate individual countries entirely from global economic developments.

## Conclusion

It is being increasingly held in the literature that, in a globalising world, flexible exchange rates are no longer enough to insulate an economy against external shocks. Our empirical results corroborate the observation that, in the past few years, global factors have had a crucial impact on domestic financial market prices and that it is becoming increasingly difficult for EMEs to find shelter. Global liquidity, in particular, has been the dominant element of the evolution of financial markets in the emerging economies.

What this means with respect to possible policy recommendations to EMEs on how they can best protect themselves from the adverse impact of volatile international capital flows is that neither flexible nor fixed exchange rates are capable of sheltering domestic financial markets from foreign shocks and of stabilising the valuation of domestic financial instruments. What appear more promising are efforts to exploit the advantages of financial integration while at the same time taking precautions to ensure that external shocks can be absorbed by a sound financial sector with high standards of safety. In this connection, too, a stable macroeconomic environment can also help prevent temporary disruptions from becoming a full-blown hazard to macroeconomic stability.