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Research Notes in Economics

The Determinants of Currency Risk Premium in Emerging Market Countries[1]

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Abstract

This note explores the variations in currency risk premium among emerging market countries. In this respect, firstly the local currency bond yields are decomposed into its risk-free rate, default risk premium and currency risk premium components. The graphical illustrations show that the currency risk premium tends to vary across emerging market countries. Pooled ordinary least square method is conducted in order to explain the variation in currency risk premium among sample countries for years between 2007 and 2016. Estimation results indicate that country-specific macroeconomic variables (foreign exchange reserves, public sector debt stock, net international investment position) and uncertainty indicators (inflation and growth volatilities) play a great role on the variation in currency risk premium for emerging market countries. These findings provide significant implications for both monetary and fiscal policy domain. Accordingly, it can be concluded that countries' borrowing costs in local currency can be reduced notably and the effectiveness of the monetary policy can be enhanced if the policies are oriented towards structurally imbalanced areas.

Özet

Bu notta gelişmekte olan ülkelerin kur riski primlerindeki değişimlerin açıklanması amaçlanmıştır. Bu kapsamda, ilk olarak yerel para birimi cinsinden ihraç edilen hazine tahvil getirileri; risksiz getiri oranı, kredi temerrüt riski primi ve kur riski primi olarak bileşenlerine ayrılmıştır. Grafiksel gösterimler kur riski priminin gelişmekte olan ülkeler arasında önemli farklılıklar sergilediğine işaret etmektedir. Ülkeler arasında ortaya çıkan farklılıkları analiz etmek amacıyla 2007-2016 yılları arası veriler ile havuzlanmış regresyon metodu kullanılmıştır. Tahmin sonuçları, ülkelere özgü değişkenlerin (döviz rezervleri, kamu borç stoku, net uluslararası yatırım pozisyonu ile belirsizlik göstergeleri olarak kullanılan büyüme oranı ve enflasyon oynaklıkları) gelişmekte olan ülkelerin kur riski primlerindeki değişimlerde büyük rol oynadıklarını göstermektedir. Çalışma sonuçları para politikası ile maliye politikası alanlarına ilişkin önemli çıkarımlar sunmaktadır. Bu doğrultuda, politikaların ekonomideki yapısal dengesizlikleri gidermeye yönelik olması durumunda gelişmekte olan ülkelerdeki yerel para birimi cinsi borçlanma maliyetlerinin düşebileceği ve para politikasının etkinliğinin artabileceği değerlendirilmektedir.

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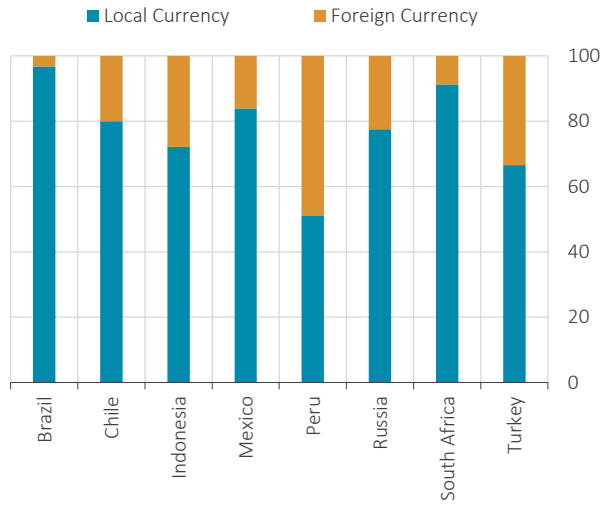
Introduction

The share of local currency denominated government debt instruments issued by emerging market countries has been rising over time.[2] As of second quarter of 2017, government debt issuance in emerging market countries is mostly denominated in local currency (Chart 1). From the point of issuers, this might be attributed to the reduction of currency mismatch, improvement in the effectiveness of monetary policy and further deepening of financial markets. Additionally, foreign participation in local currency government securities issued by several emerging market countries increased substantially in the last decade (Chart 2). The diversification of investor base with foreign investors is important for the development of debt markets in emerging market countries. From the viewpoint of investors, growing interest can be associated with improving macroeconomic outlook in emerging market countries, diversification benefits and the search for yield given low interest rates in advanced countries.

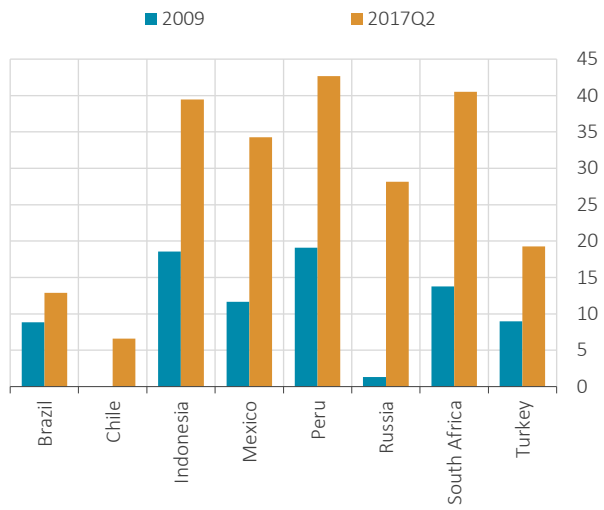
Chart 1: Currency Composition of Government Securities in Emerging Market Countries* (Percent of Total)



Source: BIS.

* As of 2017Q2.

Chart 2: Foreign Ownership in Emerging Market Local Currency Denominated Government Securities (Percent of Outstanding)

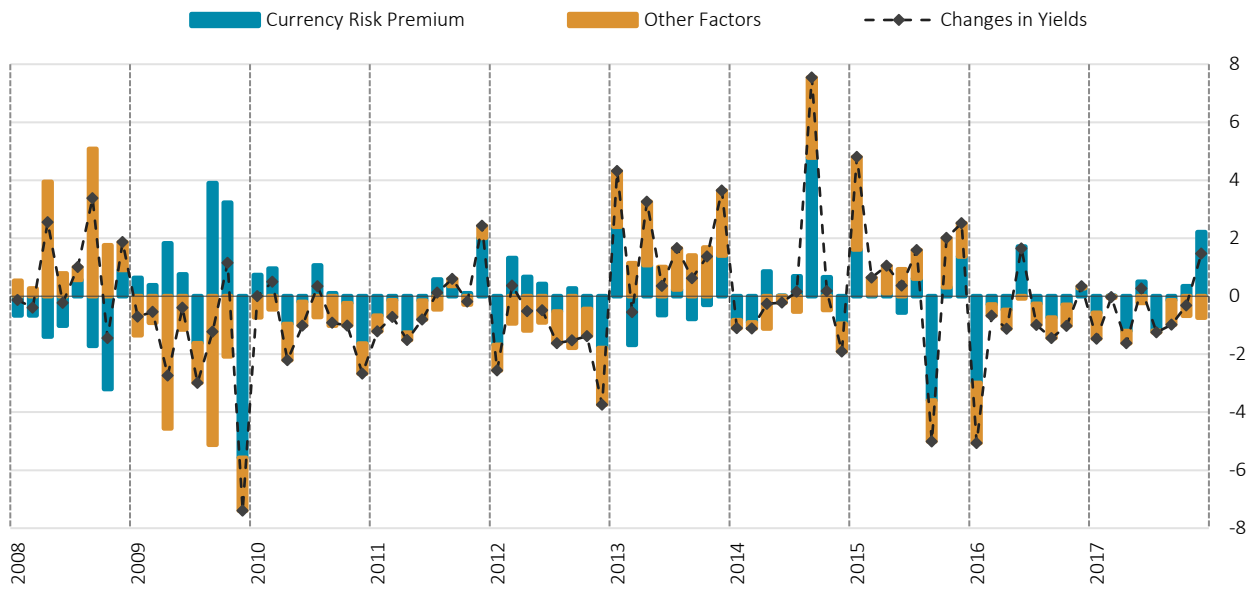


Source: IMF.

Since the majority of public debt is issued in local currency, analyzing yield determinants is crucial for the deepening of debt markets in emerging market countries. The return of a local currency debt instrument can be decomposed broadly into three parts, which are risk free interest rate, default risk premium and currency risk premium (Du et al., 2016). In compliance with this approach, changes in local currency debt yields are decomposed as changes in currency risk premium and other factors consisting of risk free interest rate and default risk premium. Based on this decomposition, changes in currency risk premium seem to be an important determinant of the annual variation in emerging market local currency debt yields over the period of 2008 – 2017 (Chart 3, each column refers to an emerging market country in the order given below for each year). In addition to being an important determinant of bond yields, it is observed that currency risk premium is quite volatile.

[2] For a detailed discussion, see IMF (2016).

Chart 3: Contribution of Currency Risk Premium and Other Factors to Annual Changes in Interest Rates* (Percentage Points)



Source: Bloomberg, Authors' Calculations.

*Emerging market countries in the chart are given in the following order for each corresponding year: Brazil, Chile, Indonesia, Mexico, Peru, Russia, South Africa and Turkey. Other factors include changes in 5-year United States (US) Treasury bond rates and credit default swap (CDS) premium.

There are studies demonstrating the importance of currency risk premium in the determination of local currency debt yields. Domowitz et al. (1998) find out that currency risk premium is economically significant for the Mexican local currency bond market, whereby implying that borrowing costs can be lowered significantly by reducing the perceived risks of a currency devaluation. Beside its economic significance, some studies adopt quantitative approaches to estimate currency risk premium. In this regard, Du et al. (2016) disentangle the currency risk premium from credit default risk for 10 emerging market countries for the period of 2005 and 2014. The results show that the mean spread of local currency nominal yields over US Treasury bond rates is found to be 5 percentage points, of which 3.7 percentage points is attributed to currency risk premium and the remaining 1.45 percent is attributed to credit default risk.

This note aims to investigate the sources of currency risk premium embedded in bond yields for emerging market countries. The next section presents the decomposition methodology for currency risk premium. The following section investigates the relation between currency risk premium and global and country-specific macroeconomic variables through pooled ordinary least squares (OLS) models. The conclusion section discusses the policy implications of the results by pointing out important areas of improvement in decreasing cost of borrowing for emerging market countries.

Data and Methodology

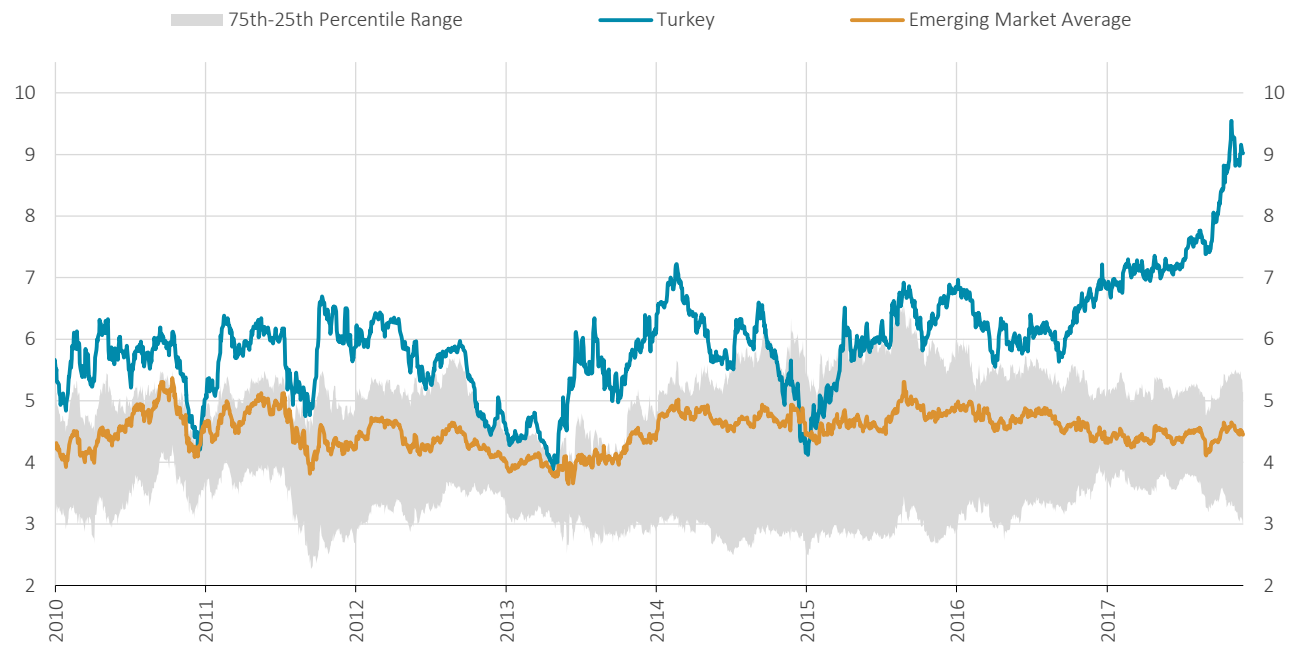
Currency risk premium can be considered as the unobservable component of nominal bond returns. The bond return can be decomposed broadly into three components: risk-free rate, default risk premium and currency risk premium. US Treasury 5-year zero rate and 5-year CDS premium are used to capture risk-free rate and default risk premium, respectively. The difference between the 5-year local currency nominal bond return and the sum of risk-free rate and credit risk premium is an approximation for currency risk premium. The currency risk premium can be mathematically expressed as follows:

$$CRP_{i,t} \sim r^{d}{}_{i,t} - CDS_{i,t} - r^{us}{}_{t}$$

where r^d and r^{us} denote the 5-year local currency bond yield for each emerging market country and the 5-year US Treasury bond yield, respectively.[3] CDS represents the 5-year CDS premium of emerging market countries in US dollars.

Currency risk premium is obtained for the period of 2007 and 2016 using daily data. The average currency risk premium of emerging market countries is presented in Chart 4. Accordingly, it is observed that currency risk premium tends to vary over time. Additionally, it can also be inferred that currency risk premium also differs across countries. For instance, currency risk premium of Turkish Treasury bond yields has demonstrated a strong upward trend since the start of 2017, whereas that of other countries has been stable during this period. The findings of this study offer clues as to which macroeconomic variables might explain this difference.

Chart 4: Average Currency Risk Premium and Cross-Sectional Dispersion* (Percentage Points)



Source: Bloomberg, Authors' calculations.

*The upper and lower bounds of the shaded region illustrates the 75th and 25th percentiles of cross-sectional currency risk premium for sample countries at each point in time, respectively. Widening of the shaded region implies higher spread across countries in terms of currency risk premium whereas a narrowing of the area points out to a more uniform distribution of currency risk premium among countries. As of December 2017.

The divergence of currency risk premium across emerging market countries brings the question as to which factors might lead to this variation. Hence, a pooled OLS method is conducted to identify macroeconomic factors and global variables that might explain the variation in currency risk premium.

Against this background, the currency risk premium for each country in annual averages is used as the dependent variable in the regression. The macroeconomic variables are selected based on earlier findings in the literature.[4] Accordingly, the following regression is adopted as the base model:

[3] Since it is difficult to decompose liquidity risk, it is not included in the analysis as a separate variable. Given that the liquidity premium and currency risk premium are interconnected, liquidity premium is assumed to be a component of currency risk premium.

[4] Giorgianni (1997), Gonzalez-Rozada and Levy-Yeyati (2008) and Jaramillo et al. (2012) are examples of studies analyzing the significance of several macroeconomic variables on nominal bond returns.

$$CRP_{i,t} = Inf_{i,t} + Res_{i,t} + Debt_{i,t} + NIIP_{i,t} + GDP_{i,t} + CAB_{i,t} + Budget_{i,t} + Stability_{i,t} + GDP^{vol}{}_i + Inf^{vol}{}_i + \varepsilon_{i,t} \quad (1)$$

Where the subscripts i denotes each country and t denotes time, while $\varepsilon_{i,t}$ denotes the error term. Inflation rate (Inf), foreign exchange (FX) reserves to Gross Domestic Product (GDP) ratio (Res), public sector debt stock to GDP ratio ($Debt$), net international investment position (NIIP) to GDP ratio ($NIIP$), GDP growth rate (GDP), current account balance to GDP ratio (CAB), budget balance to GDP ratio ($Budget$) and political stability index[5] ($Stability$) are used as the explanatory variables. In addition to these variables, volatilities of GDP growth rate (GDP^{vol}) and inflation (INF^{vol}) for each country in the sample are included in the model as indicators of macroeconomic uncertainty.

In the second stage, the first regression model is augmented with Dollar Index (DXY) and Chicago Board of Exchange Volatility Index (VIX) to account for global economic and financial conditions as follows:

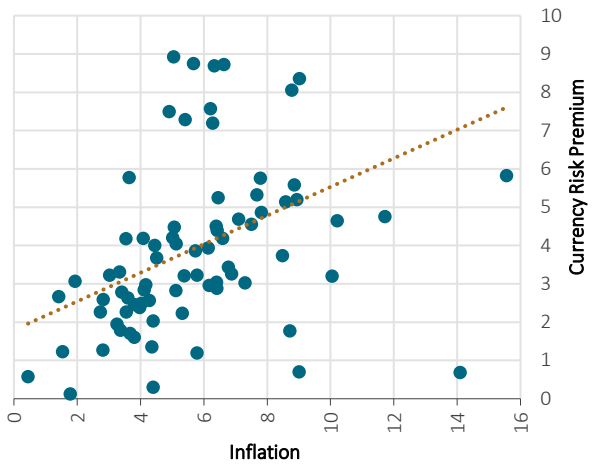
$$CRP_{i,t} = Inf_{i,t} + Res_{i,t} + Debt_{i,t} + NIIP_{i,t} + GDP_{i,t} + CAB_{i,t} + Budget_{i,t} + Stability_{i,t} + GDP^{vol}{}_i + Inf^{vol}{}_i + DXY_t + VIX_t + \varepsilon_{i,t} \quad (2)$$

Explanatory variables are used in annual frequency due to the fact that the use of stock variables in quarterly frequency is likely to create autocorrelation problem for the estimation. The absence of a significant variation in stock variables such as Res, $Debt$ and $NIIP$ in the dataset may hinder the power of significance tests for those variables. For this reason, variables are included in annual terms. To this end, stock variables are used as year-end values whereas for inflation and GDP, their yearly averages are used. In order to utilize maximum possible amount of data points, the annual change in GDP is captured by taking the average of year-on-year growth in GDP data while the annual change in inflation is seized by taking the average of year-on-year change in monthly consumer price index for each year. Uncertainty variables for each country are calculated by taking standard deviations of annual changes in GDP growth and inflation. Global variables are calculated by taking the annual average of data with daily frequency. The sample period consists of observations between 2007 and 2016 since the data for 5-year reasury bond yields is available only after 2007 for many emerging market countries. Macroeconomic variables are obtained through IMF, OECD and World Bank whereas financial variables are obtained through Bloomberg.

Before discussing the empirical findings, some graphical illustrations are presented. Accordingly, these charts indicate a meaningful relation between selected macroeconomic variables and the currency risk premium (Charts 5 to 8). Each point in the charts represents a pair of selected macroeconomic variable and currency risk premium for a single country in the sample at a certain point in time. To be more precise, 80 points in each chart represent observations for 8 countries for a 10-year period. These charts show that currency risk premium is positively correlated with inflation and public debt to GDP ratio, whereas it is negatively correlated with FX reserves to GDP and current account balance to GDP.

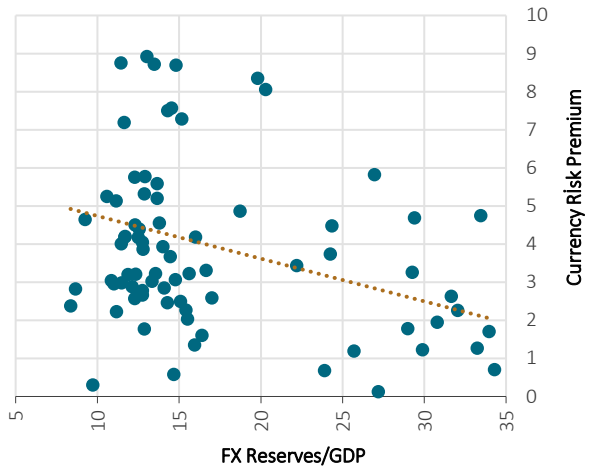
[5] Political Stability Index is derived from World Bank, World Governance Indicators (WGI). WGI consists of six dimensions of governance as voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, control of corruption. An average of these six scores is used as the political stability index. Scores range between 0 and 1 where 1 corresponds to the best political conditions and 0 is the lowest possible.

Chart 5: Currency Risk Premium vs Inflation (%)



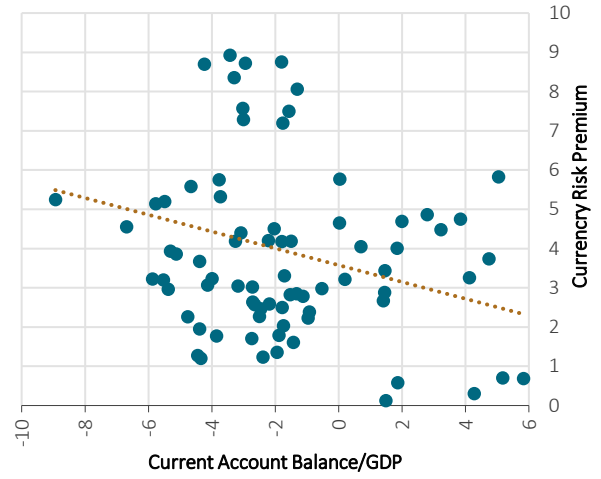
Source: Bloomberg, Author's calculations.

Chart 6: Currency Risk Premium vs FX Reserves/GDP (%)



Source: Bloomberg, Author's calculations.

Chart 7: Curency Risk Premium vs Current Account Balance/GDP (%)



Source: Bloomberg, Author's calculations.

Chart 8: Curency Risk Premium vs Public Debt Stock/GDP (%)

Source: Bloomberg, Author's calculations.

To test whether the variations in macroeconomic variables are statistically significant, pooled OLS regression method is implemented assuming heteroscedasticity robust standard errors. However, before that, Hausman specification test (Hausman, 1978) and Lagrange multiplier test (Breusch and Pagan, 1980) are applied to test whether there exists any country-specific fixed or random effect in the determination of currency risk premium. The test results indicate that neither fixed nor random effects exist that should be taken into account in the estimation. Therefore, using pooled OLS methodology is found to yield robust estimates.

Empirical Findings

In this section, the empirical findings for the pooled OLS are presented. Main findings of the regression are presented in Table 1. Additionally, normalized coefficients are also given for better comparability of the effect of each macroeconomic variable.

Table 1: Estimation Results

Currency Risk Premium	Model 1	Normalized Coefficient[6]	Model 2	Normalized Coefficient
Inflation	0.092 (0.093)	0.102	0.068 (0.096)	0.075
FX Reserves/GDP	-0.082*** (0.025)	-0.239	-0.079*** (0.024)	-0.231
Debt/GDP	0.086*** (0.012)	0.591	0.085*** (0.011)	0.590
NIIP/GDP	-0.035** (0.014)	-0.266	-0.036** (0.014)	-0.274
GDP Growth	-0.070 (0.067)	-0.097	-0.078 (0.073)	-0.109
Current Account Balance/GDP	-0.096 (0.069)	-0.119	-0.113 (0.076)	-0.141
Budget Balance/GDP	-0.012 (0.074)	-0.014	-0.013 (0.075)	-0.016
Political Stability	0.495 (2.094)	0.018	-0.249 (2.224)	-0.009
GDP Volatility	0.684*** (0.142)	0.372	0.676*** (0.144)	0.368
Inflation Volatility	1.559*** (0.376)	0.453	1.649*** (0.362)	0.479
DXY Index			-0.012 (0.020)	-0.033
VIX			0.018 (0.032)	0.047
Constant	-4.176 (2.304)		-3.212 (3.020)	
Number of Observations	80		80	
R-squared	0.751		0.755	

Note: Robust standard errors in parentheses. ***, ** and * denote the 99, 95 and 90 percent confidence level, respectively.

Estimation results show that local macroeconomic variables capture a significant part of the empirical variation in currency risk premium across countries. FX reserves to GDP, public debt stock to GDP and NIIP to GDP are found to be statistically significant. The signs of the coefficients are in line with our prior conjectures. The increases in FX reserves to GDP and NIIP to GDP tend to reduce the currency risk premium, whereas the rise in public debt to GDP puts an upward pressure on currency risk premium. In addition to these variables, GDP growth volatility and inflation volatility are both found to increase the currency risk premium. On the other hand, our results indicate that the level of GDP growth and inflation are statistically insignificant for the variation in currency risk premium of emerging market countries.[7] One striking observation is that stock variables such as public debt to GDP and NIIP to GDP matter for the changes in currency risk premium whereas their flow-variable counterparts, which are budget balance and current account balance, do not account for the variation in currency risk premium across countries.

[6] Robust normalized beta coefficients calculated from standardized variables. Comparison of robust normalized beta coefficients gives the relative explanatory power of each variable.

[7] Inflation is found to be an insignificant determinant of currency risk premium according to panel estimation although it is observed in Chart 5 that there exists a strong correlation between the two series as predicted. Statistical insignificance of inflation in panel estimation can be attributed to the view that inflation rates are mostly around 5 percent in emerging market countries and demonstrates relatively small variation during the sample period. Insufficient variation in the inflation data for the sample countries might be the cause of the statistical insignificance of that variable.

The second model results suggest that DXY and VIX are statistically insignificant for the variation in currency risk premium.[8]

Findings of our analysis show that country-specific macroeconomic variables are the main determinants of currency risk premium. To compare the effect of each macroeconomic variable on currency risk premium, robust coefficients of the standardized explanatory variables in regression models are reported. The results show that public debt stock to GDP, inflation volatility and GDP volatility, FX reserves to GDP, and NIIP to GDP tend to have stronger impact on currency risk premium.

Conclusion

The increasing share of local currency denominated bonds in the global bond markets requires a deeper understanding of the movements in bond returns. The decomposition of local bond returns shows that one of its most important and volatile components is currency risk premium. The graphical illustration indicates that currency risk premium tends to vary across emerging market countries. This note aims to find out the determinants of the variation in currency risk premium for those countries using pooled OLS models.

The main findings of these regressions show that local variables reflecting the macroeconomic outlook play a significant role in the determination of the currency risk premium in emerging market countries, whereas global factors are found to be insignificant for the variation in currency risk premium. The first one is the public debt stock to GDP, where reduction of debt stock decreases currency risk since it increases the resilience of the economy against both internal and external shocks. Secondly, FX reserves to GDP ratio provides a shield for speculative movements against local currency, and in turn, this tends to decrease the currency risk premium. In addition to these, an improvement in NIIP to GDP, which indicates lower structural imbalances, implies reduced external financing needs, which feeds into decreased currency risk premium. Lower volatility of both the GDP growth and inflation also lessens the ambiguity within the forecasting horizon of the investors reducing the risk premium.

From the viewpoint of policymakers, both fiscal and monetary policy objectives are important for enhancing the macroeconomic outlook in emerging market countries, thereby decreasing the currency risk premium. Besides these, policies towards eliminating structural imbalances play a significant role in lowering borrowing costs of emerging market countries and improving the effectiveness of the monetary policy transmission. It should however be noted that this requires strong coordination and collaboration among fiscal and monetary authorities, which is beyond the scope of this paper.

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[8] Correlation among VIX and DXY is calculated to be -0.5. Excluding one of these two variables from the model does not affect the insignificance of the other variable on the determination of currency risk premium.

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