Equity Returns, Corporate Bond Spreads, and Economic Activity in Emerging Countries*

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Abstract

Caballero, Fernández, and Park (2019) document an increased role of corporate debt issuance in foreign capital flows of emerging market economies (EMEs). Using corporate bond yields of EMEs, the authors construct an external financial indicator and show that the indicator has predictive power for future output growth, accounts for a sizeable fraction of output fluctuations, and propagates changes in global financial risk conditions to these countries. We show that equity flows to EMEs are comparable in size to debt flows, and that considering EME equity returns as a proxy of domestic and external financial conditions produces stronger results for explaining economic activity in EMEs.

JEL classification: E32, E37, F34, F37, G15

Keywords: equity returns, bond spreads, economic activity, emerging economies

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1 Introduction

The deepening of global financial integration in the 21st century has had a great impact on business cycle fluctuations in emerging market economies (EMEs). Caballero, Fernández, and Park (2019)—henceforth, CFP—demonstrate that during this period the corporate bond issuance has become a large source of international financial capital flows. They show that emerging country corporate bond spreads, even when controlling for the effects of sovereign bond spreads, are a key factor in forecasting future output growth, accounting for output fluctuations, and transmitting global financial risk shocks to EMEs.[1] In this note, we document that equity returns play a more important role in explaining EME output growth.

Using the two samples of emerging countries EFI-5 and EFI-10 constructed by CFP,[2] we show in Figure 1 that net equity portfolio inflows to EMEs are similar in size to net debt inflows.[3] CFP utilize yields on EME corporate bonds issued in foreign capital markets over the 1999Q2 – 2017Q2 period to build an external financial indicator (EFI). Comparatively, we use stock market returns in EMEs as a measure summarizing local and external financial conditions. We show that equity returns embed additional information to corporate bond spreads in (i) predicting future economic activity, (ii) explaining fluctuations of output growth, and (iii) propagating global financial risk shocks to EMEs.[4] The results point to a partial segmentation between equity and debt markets, consistent with the works of Duffie (2010); Greenwood, Hanson, and Liao (2018); Pitkäjärvi, Suominen, and Vaittinen (2020). This paper joins CFP in contributing to the vast theoretical and empirical literature that examines the role of external factors in driving EME business cycles (e.g., Akıncı,

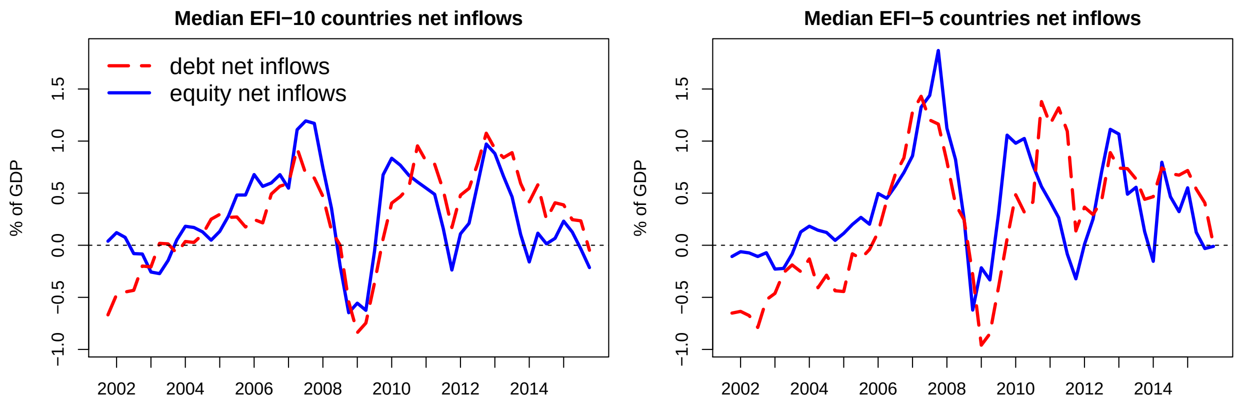
[1] A large literature, started by Neumeyer and Perri (2005) and Uribe and Yue (2006), has used sovereign bonds spreads to document the importance of country interest rates for macroeconomic volatility in EMEs.

[2] EFI-5 includes Brazil, Chile, Malaysia, Mexico, Philippines, while EFI-10 consists of Colombia, Peru, Russia, South Africa, Turkey, and EFI-5 countries.

[3] With more refined data, Hevia and Neumeyer (2020) and Matthews (2020) use the Institute of International Finance's daily flow tracker to show that equity flows to EMEs account for a disproportionately larger share of total non-resident portfolio flows than debt flows during crises such as the Global Financial Crisis and the COVID-19 Crisis.

[4] The discussion is centered on EFI-10 countries. The results also hold for EFI-5 countries and are relegated to the Online Appendix.

Figure 1: Net equity and debt inflows to EMEs as a percentage of GDP



Notes: EFI-5 countries include Brazil, Chile, Malaysia, Mexico, and Philippines. EFI-10 countries include Colombia, Peru, Russia, South Africa, Turkey, and EFI-5 countries. Flows and GDP are measured in US dollars and over the 2001Q1-2015Q4 period. Net inflows denote moving averages over the last four quarters and are constructed as the difference between non-resident portfolio inflows to and outflows from EMEs. Inflows are sourced from Cerutti, Claessens, and Puy (2019). Outflows are authors' own calculation using data from IMF's Balance of Payment (BOP) database.

2013; Bhattarai, Chatterjee, and Park, 2019; Chang and Fernández, 2013; Epstein, Shapiro, and Gómez, 2019; Fernández and Gulan, 2015; Fernández-Villaverde, Guerrón-Quintana, Rubio-Ramírez, and Uribe, 2011; Mendoza and Yue, 2012).

The rest of the paper proceeds as follows. Section 2 presents forecasting regressions. Section 3 describes a panel structural vector autoregressive model and Section 4 analyzes the transmission of global financial risk shocks to EMEs. Section 5 concludes.

2 Forecasting Regressions

CFP first investigate the relationship between corporate bond spreads and economic activity in EMEs by considering forecasting regressions. This allows the authors to impose little structure on the data while controlling for additional global and country-specific factors. We extend the forecasting regressions by including a measure of EME equity returns (EqR) and find that equity returns have a stronger predictive power of future GDP growth, especially at longer horizons, than corporate (EFI) and sovereign ($EMBI$) bond spreads.

Following CFP, we estimate the following dynamic forecasting panel regressions of future real GDP growth on current changes in EFI, $EMBI$, EqR, and various global and country-specific control variables:

$$\triangle GDP^k_{t+h} = \alpha_k + \sum_{j=0}^{p} \beta_j \triangle GDP^k_{t-j} + \gamma \triangle EFI^k_t + \delta \triangle EMBI^k_t + \theta EqR^k_t + \psi \triangle GR_t + \Gamma \Omega^k_t + \epsilon^k_{t+h}, \quad (1)$$

where t represents the current period, h captures the forecast horizon that ranges up to five periods, p represents the number of lags set to 11, k denotes an EME country, and α_k is a country fixed effect. Economic activity is measured by $\triangle GDP^k$, which represents percentage annual log changes in real GDP. $\triangle EFI^k$ denotes annual changes in the external financial indicator, a proxy CFP developed for country corporate bond spreads. $\triangle EMBI^k$ refers to annual changes in the J.P.Morgan's Emerging Market Bond Index, a commonly used proxy for country sovereign bond spreads. Both spreads are measured in percentage points.

EqR^k is our new variable and stands for real equity returns, expressed in percentages. It is constructed using annual log differences of country-specific stock market index prices, which are deflated using the country's consumer price index.[5] We find that equity returns exhibit a high median correlation of 0.42 with output growth across the EFI-10 countries. In addition, principal component analysis reveals a large comovement of equity returns in EMEs—the first principal component accounts for about 69 percent of the sample variation.

The rest of the control variables in equation (1) include global financial risk conditions ($\triangle GR$) proxied by the VIX index ($\triangle VIX$) capturing the US option-implied volatility of the S&P 500 index, and the US Baa spread ($\triangle Baa$) measuring the difference between the Moody's US Baa Corporate and 10-year Treasury rates. Both global risk proxies enter the equation in annual changes. Ω^k consists of an additional set of global and local control variables. The global set includes annual changes in the US real federal funds rate (the difference between the effective nominal federal funds rate and the US core personal consumer expenditure inflation) and annual changes in the US yield spread (difference between the 10-

[5] We use the following capitalization-weighted stock market indexes sourced from Global Financial Data: IBXD (Brazil), IGPAD (Chile), IGBCD (Colombia), KLSED (Malaysia), MXXD (Mexico), SPBLPGPT (Peru), PSID (Philippines), MCXD (Russia), JALSHD (South Africa), and XU100D (Turkey).

year and 3-month US Treasury rates). The local set contains country-specific annual changes in the real monetary policy rate (domestic nominal policy rate less of domestic inflation) and the commodity price index constructed by Fernández, González, and Rodriguez (2018). Equation (1) is estimated with Driscoll and Kraay (1998) robust standard errors.

The estimated coefficients for the variables of interest are reported in Table 1 together with t-statistics in parenthesis. The top panel, Spec.4 (with EqR), presents results from estimating equation (1). The bottom panel, Spec.4 (CFP), excludes *EqR* from the equation, and hence replicates the results in CFP for their most general specification 4.[6] We expand the forecasting horizon to five instead of four quarters, and convert *EFI* from basis to percentage points to ease comparison.

Table 1 reveals three sets of results. First, the forecasting power of *EqR* for future output growth in EMEs is statistically significant at the 1% level for all considered horizons. Moreover, the t-statistics associated with the coefficient for *EqR* ($\hat{\theta}$) are, on average, 2.8 times larger than the ones for $\triangle EFI$. Second, the inclusion of *EqR* reduces the significance of $\triangle EFI$. The estimated coefficient for $\triangle EFI$ ($\hat{\gamma}$) decreases by over a third, on average, across the horizons and the corresponding t-statistics decrease by about a fifth. The $\triangle EFI$ coefficient remains statistically significant at the 1% level for the first two horizons ($h = 1, 2$), but its significance decreases to 5% for $h = 3$ and becomes insignificant for $h = 4, 5$. $\triangle EMBI$ remains statistically insignificant after the inclusion of equity returns. Third, the estimated coefficients for *EqR*, although considerably smaller in magnitude than for $\triangle EFI$, are economically sizeable given the large variability of equity returns. The coefficient for *EqR* ranges from 0.015 to 0.040, while for $\triangle EFI$ from -0.031 to -0.14. However, the standard deviation of $\triangle EFI$ and *EqR* is 2.5 and 28.0. For $h = 1$, for example, this implies that a one standard deviation increase in *EqR* is associated with a 0.42 ($= 28.0 \times 0.015$) percentage point increase in the next quarter's GDP growth, whereas for $\triangle EFI$ it translates into a change of only -0.16 ($= 2.5 \times -0.065$) percentage points.

[6]The results hold for other CFP specifications and are available upon request.

Table 1: Forecasting regressions

Spec.4 with EqR	h=1: $\triangle GDP^k_{t+1}$	h=2: $\triangle GDP^k_{t+2}$	h=3: $\triangle GDP^k_{t+3}$	h=4: $\triangle GDP^k_{t+4}$	h=5: $\triangle GDP^k_{t+5}$
$\triangle EFI^k_t$	-0.065***	-0.14***	-0.13**	-0.10	-0.031
	(-2.92)	(-3.28)	(-2.44)	(-1.36)	(-0.37)
$\triangle EMBI^k_t$	0.040	0.0087	-0.062	-0.060	-0.038
	(1.33)	(0.19)	(-1.23)	(-0.98)	(-0.58)
EqR^k_t	0.015***	0.029***	0.038***	0.040***	0.029***
	(5.22)	(5.97)	(7.49)	(7.10)	(3.59)
$\triangle VIX_t$	0.0047	0.053*	0.093**	0.088**	0.045
	(0.37)	(1.85)	(2.15)	(2.08)	(1.07)
$\triangle Baa_t$	-0.084	-0.50	-0.94**	-1.03*	-0.56
	(-0.51)	(-1.57)	(-2.01)	(-1.85)	(-1.14)
R^2	0.853	0.671	0.524	0.378	0.233
Adjusted R^2	0.845	0.652	0.496	0.341	0.187
Observations	550	541	532	523	514
Spec.4 (CFP)	h=1: $\triangle GDP^k_{t+1}$	h=2: $\triangle GDP^k_{t+2}$	h=3: $\triangle GDP^k_{t+3}$	h=4: $\triangle GDP^k_{t+4}$	h=5: $\triangle GDP^k_{t+5}$
$\triangle EFI^k_t$	-0.086***	-0.18***	-0.18***	-0.16*	-0.076
	(-3.06)	(-3.27)	(-2.76)	(-1.97)	(-0.89)
$\triangle EMBI^k_t$	0.018	-0.033	-0.12	-0.12	-0.078
	(0.37)	(-0.43)	(-1.33)	(-1.30)	(-0.95)
EqR^k_t					
$\triangle VIX_t$	-0.000028	0.044	0.081	0.075	0.035
	(-0.00)	(1.27)	(1.55)	(1.46)	(0.81)
$\triangle Baa_t$	-0.11	-0.56	-1.01*	-1.10*	-0.60
	(-0.60)	(-1.45)	(-1.81)	(-1.69)	(-1.11)
R^2	0.843	0.634	0.460	0.306	0.192
Adjusted R^2	0.834	0.613	0.429	0.265	0.143
Observations	550	541	532	523	514

Notes: The table reports estimated coefficients, and t-statistics in parenthesis, from a dynamic panel regression specified in equation (1) in the main text, with the dependent variable being future annual real GDP growth ($\triangle GDP^k{}_{t+h}$) measured in percentages. EFI-10 countries include Brazil, Chile, Colombia, Malaysia, Mexico, Peru, Philippines, Russia, South Africa, and Turkey. The sample is unbalanced over the 1999Q2-2017Q1 period. $\triangle EFI$ and $\triangle EMBI$ refer to annual percentage point changes in country-specific corporate and sovereign bond spreads. EqR denotes equity returns measured as annual percent log changes in country-specific stock market prices. $\triangle VIX$ and $\triangle Baa$ stand for annual changes in the US option-implied S&P 500 index volatility and in the difference between the Moody's US Baa Corporate and 10-year Treasury rates, expressed in percentage points. *, **, and *** indicate significance level at 10%, 5%, and 1%. The bottom panel replicates the results of Caballero et al. (2019) for their specification 4. The top panel adds equity returns to the specification.

3 Structural Vector Autoregressive Models

Using panel structural vector autoregressive (PSVAR) models, CFP impose additional structure on the data, which enables them to isolate the effect of exogenous shocks to corporate and sovereign bond spreads on the economic activity in EMEs. In this section, we enrich the PSVAR models with our measure of EME equity returns, *EqR*. Our results show equity return shocks to be a more important driver of output fluctuations than corporate and sovereign spread shocks.

We use the CFP's least-squares dummy variable approach and data for EFI-10 countries over the 1999Q2-2017Q1 period to estimate the following PSVAR model:

$$AY_t^k = C^k + \sum_{j=1}^{p} B_j Y_{t-j}^k + \epsilon_t^k. \tag{2}$$

C^k denotes a country fixed effect, p denotes the number of lags, A and B denote coefficient matrices, Y^k represents a vector of variables of interest and ϵ^k represents the corresponding structural shocks.

We consider the 3-variable and 5-variable PSVAR models M1-M7 shown in Table 2. In each model, the Y vector consists of $\triangle GDP^k$ ordered first, $\triangle GR$ ordered second, and some combination of domestic financial variables: $\triangle EFI^k$, $\triangle EMBI^k$, and EqR^k. The 3-variable models (M1-M3) include one domestic financial variable at a time and allow us to isolate the individual impact of shocks to corporate spreads, sovereign spreads, and equity returns on economic activity in EMEs. Note that models M1 and M2 correspond to CFP's models A and C. The 5-variable models (M4-M7) incorporate the three domestic financial variables simultaneously in the Y vector and consider all possible orderings of them. These models allow us to run a horse race among the local financial variables while being agnostic about their ordering.

Identification is achieved by imposing two conditions. First, the matrix A is assumed to be lower triangular with ones on the diagonal. Second, given the typically small size of EMEs, global risk is assumed not to respond to changes in the country-specific conditions. The variable ordering in Y implies that domestic output responds to variations in global risk with a one-period lag, while the domestic financial variables, given their fast-moving nature,

Table 2: Variance decomposition of GDP growth

Panel A: Global Risk (GR) is proxied by VIX					
3-variable PSVAR models	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M1(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k]$	0.57	0.31	0.13	-	-
M2(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k]$	0.60	0.36	-	0.04	-
M3:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k]$	0.47	0.23	-	-	0.30
5-variable PSVAR models	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M4:$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k, \triangle EMBI_t^k, EqR_t^k]$	0.44	0.20	0.14	0.00	0.23
M5:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EFI_t^k, \triangle EMBI_t^k]$	0.44	0.20	0.05	0.00	0.30
M6:$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k, \triangle EFI_t^k, EqR_t^k]$	0.43	0.20	0.13	0.01	0.23
M7:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EMBI_t^k, \triangle EFI_t^k]$	0.44	0.20	0.06	0.00	0.30
Panel B: Global Risk (GR) is proxied by US Baa spread					
3-variable PSVAR models	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M1(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k]$	0.43	0.50	0.06	-	-
M2(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k]$	0.44	0.54	-	0.02	-
M3:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k]$	0.41	0.38	-	-	0.21
5-variable PSVAR models	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M4:$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k, \triangle EMBI_t^k, EqR_t^k]$	0.38	0.39	0.07	0.00	0.16
M5:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EFI_t^k, \triangle EMBI_t^k]$	0.38	0.39	0.02	0.01	0.20
M6:$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k, \triangle EFI_t^k, EqR_t^k]$	0.38	0.39	0.07	0.01	0.16
M7:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EMBI_t^k, \triangle EFI_t^k]$	0.38	0.39	0.03	0.00	0.20

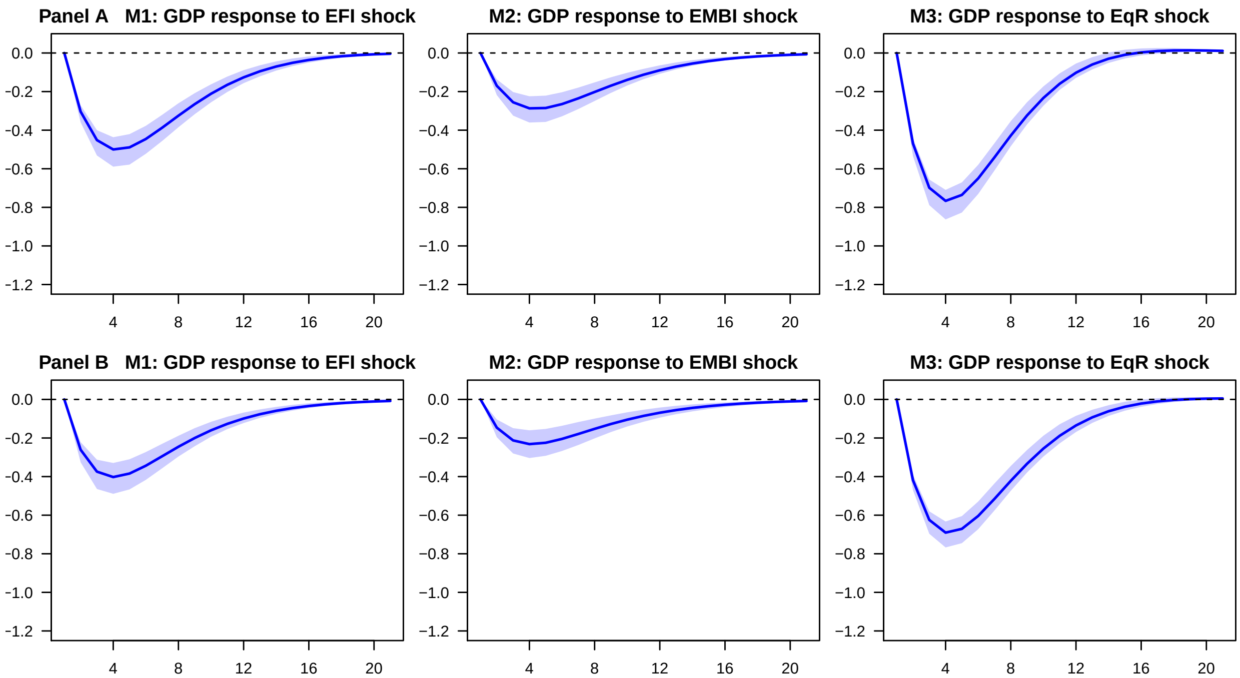
Notes: The table shows the forecast error variance decomposition, i.e., the fraction of real GDP growth variance explained by GDP, VIX, Baa, EFI, EMBI, and EqR shocks across 3-variable and 5-variable panel structural VAR models M1-M7. The sample period is 1999Q2-2017Q1 and includes EFI-10 countries.

are assumed to respond to changes in global risk within the same period. The number of lags (p) is set to one.

Table 2 reports the variance decomposition results for real GDP growth in EMEs. Panel A uses the VIX index as a proxy of global risk, whereas Panel B uses the US baa spread. In line with CFP, we find that $\triangle EMBI$ shocks account for only up to 4 percent, while $\triangle EFI$ shocks account for 6 to 14 percent of output fluctuations. More notably, equity return shocks emerge to be a more important driver of output fluctuations: innovations in EqR explain from 16 to 30 percent of the variance in output growth.

Table 2 also shows that global risk shocks explain a significant fraction, between 20 and 54 percent, of the variance in EME output growth. We find, however, that their contribution decreases considerably when we consider, instead of corporate or sovereign spreads, equity

Figure 2: Impulse response functions of GDP growth to domestic financial variable shocks

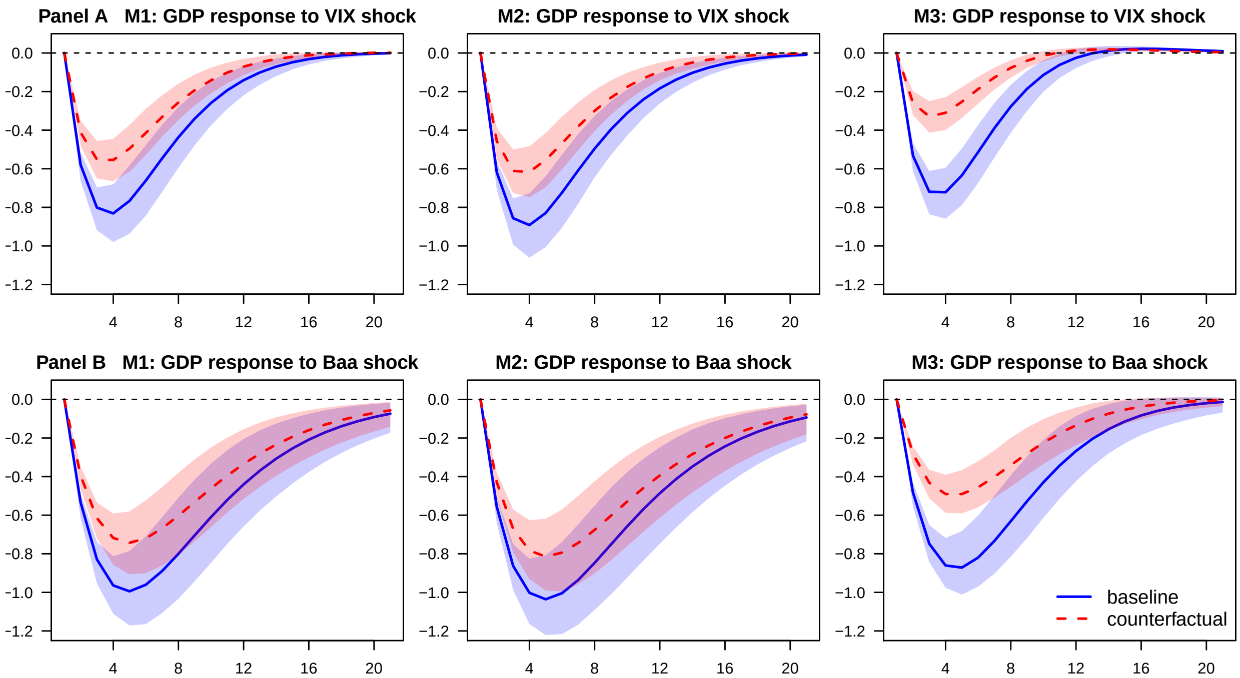


Notes: The figure shows impulse response functions of annual real GDP growth to a one standard deviation $\triangle EFI$, $\triangle EMBI$, and EqR shock. EqR displays a negative shock for comparison. M1, M2, and M3 in given columns denote 3-variable panel structural VAR models 1,2, and 3 shown in Table 2, estimated over the 1999Q2-2017Q2 period for EFI-10 countries. Global risk (GR) is proxied by the VIX index (VIX) in Panel A and by the US Baa corporate spread (Baa) in Panel B. The shaded areas represent 95% confidence bands obtained with bootstrapping.

returns in the 3-variable PSVAR models. In particular, the contribution of global risk shocks to EME output variance decreases from about a third to a fourth when using the VIX index as a proxy of GR, and from roughly a half to two fifths when using the US baa spread.

Additional results can be seen in Figure 2, where each row depicts the impulse response functions of real GDP growth to a positive one standard deviation shock to $\triangle EFI$ (M1), $\triangle EMBI$ (M2), and, for comparison, a negative shock to EqR (M3). The global risk ($\triangle GR$) is proxied by $\triangle VIX$ in the top row (Panel A) and by $\triangle Baa$ in the bottom row (Panel B). Figure 2 shows that EqR shocks lead to a more pronounced decrease of output than $\triangle EFI$ and $\triangle EMBI$ shocks. Specifically, equity return shocks lower GDP growth in EMEs by roughly 50 percent more than corporate spread shocks. In the top row, the output response reaches a trough of -0.50, -0.29, and -0.77 percentage points to an $\triangle EFI$, $\triangle EMBI$, and EqR

Figure 3: Impulse response functions of GDP growth to global risk shocks



Notes: The figure shows impulse response functions of annual real GDP growth to a one standard deviation $\triangle GR$ shock, proxied by $\triangle VIX$ in Panel A and $\triangle Baa$ in Panel B. The baseline responses are depicted with a solid line. The dashed line represents a counterfactual scenario, when $\triangle EFI$ (M1), $\triangle EMBI$ (M2), and EqR (M3) is assumed not to respond to changes in $\triangle GR$. M1, M2, and M3 in given columns denote 3-variable panel structural VAR models 1,2, and 3 shown in Table 2, estimated over the 1999Q2-2017Q2 period for EFI-10 countries. The shaded areas represent 95% confidence bands obtained with bootstrapping.

shock, whereas output growth is lowered by 0.40, 0.23, and 0.69 percentage points in the bottom row.

Figure 3 shows the impulse response functions of GDP growth for models M1-M3 to global risk shocks, proxied by the VIX index in panel A and by the US Baa spread in panel B. The responses depicted by the blue solid line reveal that the output decrease becomes less pronounced when the baseline model specification includes equity returns (M3), instead of corporate (M1) or sovereign bond spreads (M2).

Table 3: Variance decomposition of GDP growth: counterfactual analysis

Panel A: Global Risk (GR) is proxied by VIX					
Model	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M1	0.57	0.31	0.13	-	-
M1 counterfactual	0.69	0.16	0.15	-	-
M2	0.60	0.36	-	0.04	-
M2 counterfactual	0.75	0.20	-	0.05	-
M3	0.47	0.23	-	-	0.30
M3 counterfactual	0.58	0.05	-	-	0.37
Panel B: Global Risk (GR) is proxied by US Baa spread					
Model	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M1	0.43	0.50	0.06	-	-
M1 counterfactual	0.55	0.36	0.08	-	-
M2	0.44	0.54	-	0.02	-
M2 counterfactual	0.55	0.42	-	0.03	-
M3	0.41	0.38	-	-	0.21
M3 counterfactual	0.53	0.17	-	-	0.30

Notes: The table shows the fraction of real GDP growth variance explained by GDP, VIX, EFI, EMBI, and EqR shocks. M1-M3 denote baseline models, which allow feedback from changes in global risk to EFI, EMBI, or EqR. M1 counterfactual - M3 counterfactual denote models when EFI, EMBI, or EqR is assumed not to respond directly to changes in global risk, measured by the VIX index in Panel A and by the US Baa spread in Panel B. The sample period is 1999Q2-2017Q1 and includes EFI-10 countries.

4 Transmission

We provide evidence suggesting that the larger impact of equity return shocks on economic activity in EMEs is due to equity returns transmitting global risk shocks more effectively than corporate and sovereign bond spreads.

We consider a counterfactual experiment where, as in CFP, we assume that the local financial variable in the 3-variable PSVAR models M1-M3 does not directly respond to movements in global risk. The counterfactual impulse response functions of output growth to global risk shocks are shown in Figure 3 with red dashed lines. Compared to the baseline case, the output response to a $\triangle GR$ shock in model M3 is significantly smaller under the counterfactual scenario, when EqR is assumed not to propagate fluctuations in global risk. However, when EFI (M1) or $EMBI$ (M2) is not allowed to respond to changes in global risk, the baseline and counterfactual response of output is rather similar; especially given the considerable overlap of the confidence bands.

Table 3 presents the variance decomposition results of the counterfactual exercise for models M1-M3. When we shut off the response of equity returns to global risk, the contribution of global risk shocks to EME macroeconomic fluctuations decreases by over a half, while the contribution of equity returns increases sizeably. The contribution of corporate and sovereign spread shocks remains similar under the counterfactual scenario. Further, innovations in global risk explain the smallest fraction of GDP growth variance when equity returns are forced not to react to changes in global risk. The results point to the association of the forward looking nature of stock prices with economic activity to be a key propagation mechanism of global risk shocks to EMEs. This is in line with Bathia, Bouras, Demirer, and Gupta (2020) where the EME stock market returns are highly sensitive to cross-border equity and bond flows.

Overall, we demonstrate that equity returns contain information about aggregate economic activity in EMEs beyond the information embedded in corporate and sovereign bond spreads. The analysis suggests some degree of market segmentation between equity and debt markets in EMEs, consistent with the presence of slow-moving capital in equity and debt markets presented in Pitkäjärvi et al. (2020).

5 Conclusion

Caballero et al. (2019) construct a new measure of corporate bond spreads in EMEs to proxy for external financial conditions in these countries. The authors show that the measure of corporate spreads has a predictive power for future economic activity and accounts for a sizeable fraction of macroeconomic fluctuations, even after controlling for a well-known measure of sovereign bond spreads. In this note, we show that the behavior of EME equity returns is a more important factor in predicting and accounting for movements of economic activity in emerging countries, and for propagating the fluctuations in global financial conditions to these economies.

Declaration of Interest

All authors declare that they have no relevant information or potential conflicts of interest to disclose.

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Online Appendix (not for publication)

In the Online Appendix, we present results analogous to those in the main text but using EFI-5 countries (Brazil, Chile, Malaysia, Mexico, Philippines), instead of EFI-10 countries.

Table A.1: Forecasting regressions (EFI-5)

Spec.4 with EqR	h=1: $\triangle GDP^k_{t+1}$	h=2: $\triangle GDP^k_{t+2}$	h=3: $\triangle GDP^k_{t+3}$	h=4: $\triangle GDP^k_{t+4}$	h=5: $\triangle GDP^k_{t+5}$
$\triangle EFI^k_t$	-0.068	-0.21	-0.26*	-0.25	-0.17
	(-0.79)	(-1.51)	(-1.91)	(-1.47)	(-1.06)
$\triangle EMBI^k_t$	0.061	0.11	0.099	0.067	-0.00087
	(0.67)	(0.71)	(0.64)	(0.36)	(-0.00)
EqR^k_t	0.022***	0.039***	0.045***	0.037***	0.010
	(6.10)	(5.27)	(4.85)	(3.29)	(0.62)
$\triangle VIX_t$	0.0048	0.058**	0.11***	0.093**	0.035
	(0.34)	(2.12)	(3.09)	(2.55)	(0.70)
$\triangle Baa_t$	-0.24	-0.65	-1.16**	-1.27*	-0.59
	(-1.17)	(-1.64)	(-2.01)	(-1.76)	(-0.94)
R^2	0.839	0.612	0.453	0.256	0.121
Adjusted R^2	0.826	0.581	0.409	0.195	0.048
Observations	334	329	325	319	314
Spec.4 (CFP)	h=1: $\triangle GDP^k_{t+1}$	h=2: $\triangle GDP^k_{t+2}$	h=3: $\triangle GDP^k_{t+3}$	h=4: $\triangle GDP^k_{t+4}$	h=5: $\triangle GDP^k_{t+5}$
$\triangle EFI^k_t$	-0.11	-0.29*	-0.35**	-0.32*	-0.19
	(-1.19)	(-1.83)	(-2.31)	(-1.79)	(-1.10)
$\triangle EMBI^k_t$	0.022	0.041	0.016	0.00050	-0.018
	(0.26)	(0.27)	(0.09)	(0.00)	(-0.09)
EqR^k_t					
$\triangle VIX_t$	-0.00054	0.048	0.094**	0.083*	0.032
	(-0.03)	(1.37)	(2.08)	(1.97)	(0.68)
$\triangle Baa_t$	-0.25	-0.67	-1.19*	-1.28	-0.59
	(-1.12)	(-1.45)	(-1.79)	(-1.62)	(-0.92)
R^2	0.826	0.572	0.397	0.219	0.118
Adjusted R^2	0.812	0.538	0.349	0.155	0.045
Observations	334	329	325	319	314

Notes: The table reports estimated coefficients, and t-statistics in parenthesis, from a dynamic panel regression specified in equation (1) in the main text, with the dependent variable being future annual real GDP growth ($\triangle GDP^k{}_{t+h}$) measured in percentages. EFI-5 countries include Brazil, Chile, Malaysia, Mexico, and Philippines. The sample is balanced over the 1999Q2-2017Q1 period. $\triangle EFI$ and $\triangle EMBI$ refer to annual percentage point changes in country-specific corporate and sovereign bond spreads. EqR denotes equity returns measured as annual percent log changes in country-specific stock market prices. $\triangle VIX$ and $\triangle Baa$ stand for annual changes in the US option-implied S&P 500 index volatility and in the difference between the Moody's US Baa Corporate and 10-year Treasury rates, expressed in percentage points. *, **, and *** indicate significance level at 10%, 5%, and 1%. The bottom panel replicates the results of Caballero et al. (2019) for their specification 4. The top panel adds equity returns to the specification.

Table A.2: Variance decomposition of GDP growth (EFI-5)

Panel A: Global Risk (GR) is proxied by VIX					
3-variable PSVAR models	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M1(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k]$	0.56	0.41	0.03	-	-
M2(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k]$	0.52	0.44	-	0.03	-
M3:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k]$	0.47	0.34	-	-	0.18
5-variable PSVAR models	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M4:$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k, \triangle EMBI_t^k, EqR_t^k]$	0.46	0.32	0.05	0.00	0.16
M5:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EFI_t^k, \triangle EMBI_t^k]$	0.46	0.32	0.01	0.00	0.21
M6:$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k, \triangle EFI_t^k, EqR_t^k]$	0.46	0.32	0.04	0.01	0.16
M7:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EMBI_t^k, \triangle EFI_t^k]$	0.46	0.32	0.01	0.00	0.21
Panel B: Global Risk (GR) is proxied by US Baa spread					
3-variable PSVAR models	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M1(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k]$	0.40	0.59	0.01	-	-
M2(CFP):$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k]$	0.63	0.36	-	0.00	-
M3:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k]$	0.36	0.51	-	-	0.12
5-variable PSVAR models	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M4:$[\triangle GDP_t^k, \triangle GR_t, \triangle EFI_t^k, \triangle EMBI_t^k, EqR_t^k]$	0.37	0.51	0.03	0.00	0.10
M5:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EFI_t^k, \triangle EMBI_t^k]$	0.37	0.51	0.00	0.00	0.12
M6:$[\triangle GDP_t^k, \triangle GR_t, \triangle EMBI_t^k, \triangle EFI_t^k, EqR_t^k]$	0.37	0.51	0.02	0.01	0.10
M7:$[\triangle GDP_t^k, \triangle GR_t, EqR_t^k, \triangle EMBI_t^k, \triangle EFI_t^k]$	0.37	0.51	0.00	0.00	0.12

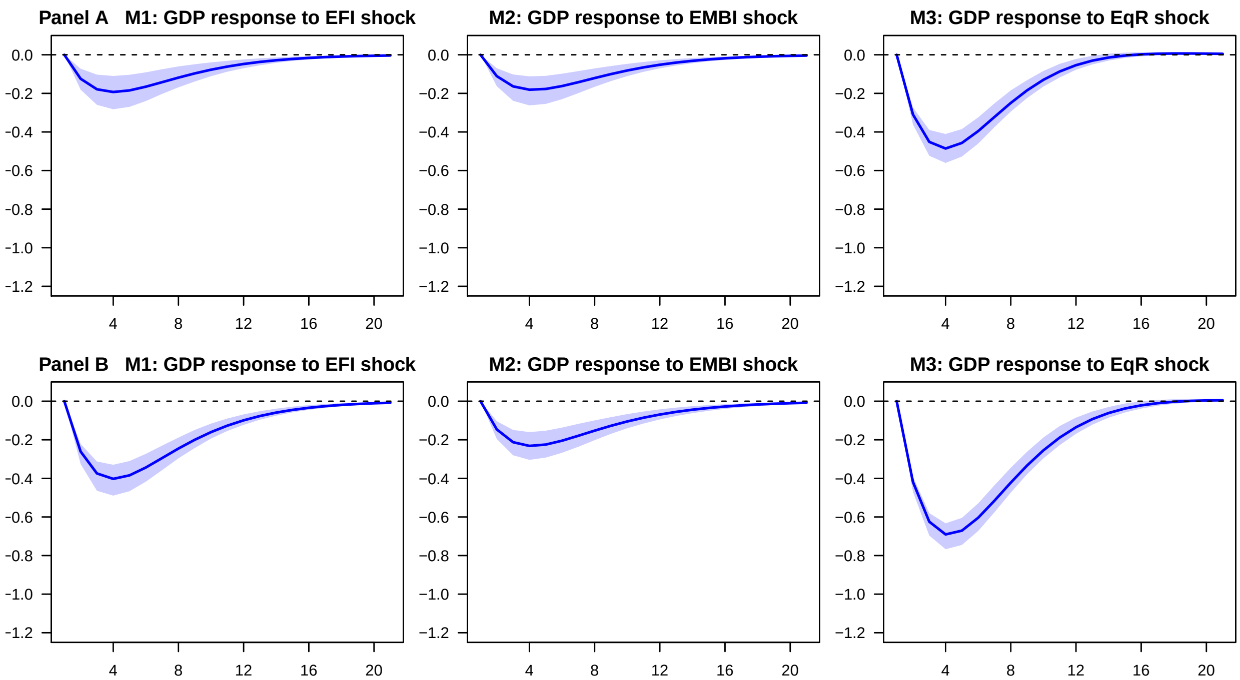
Notes: The table shows the forecast error variance decomposition, i.e., the fraction of real GDP growth variance explained by GDP, VIX, Baa, EFI, EMBI, and EqR shocks across 3-variable and 5-variable panel structural VAR models M1-M7. The sample period is 1999Q2-2017Q1 and includes EFI-5 countries.

Table A.3: Variance decomposition of GDP growth: counterfactual analysis (EFI-5)

Panel A: Global Risk (GR) is proxied by VIX					
Model	GDP shock	VIX shock	EFI shock	EMBI shock	EqR shock
M1	0.56	0.41	0.03	-	-
M1 counterfactual	0.65	0.31	0.03	-	-
M2	0.52	0.44	-	0.03	-
M2 counterfactual	0.62	0.35	-	0.03	-
M3	0.47	0.34	-	-	0.18
M3 counterfactual	0.61	0.15	-	-	0.24
Panel B: Global Risk (GR) is proxied by US Baa spread					
Model	GDP shock	Baa shock	EFI shock	EMBI shock	EqR shock
M1	0.40	0.59	0.01	-	-
M1 counterfactual	0.47	0.51	0.02	-	-
M2	0.63	0.36	-	0.00	-
M2 counterfactual	0.65	0.35	-	0.00	-
M3	0.36	0.51	-	-	0.12
M3 counterfactual	0.55	0.26	-	-	0.19

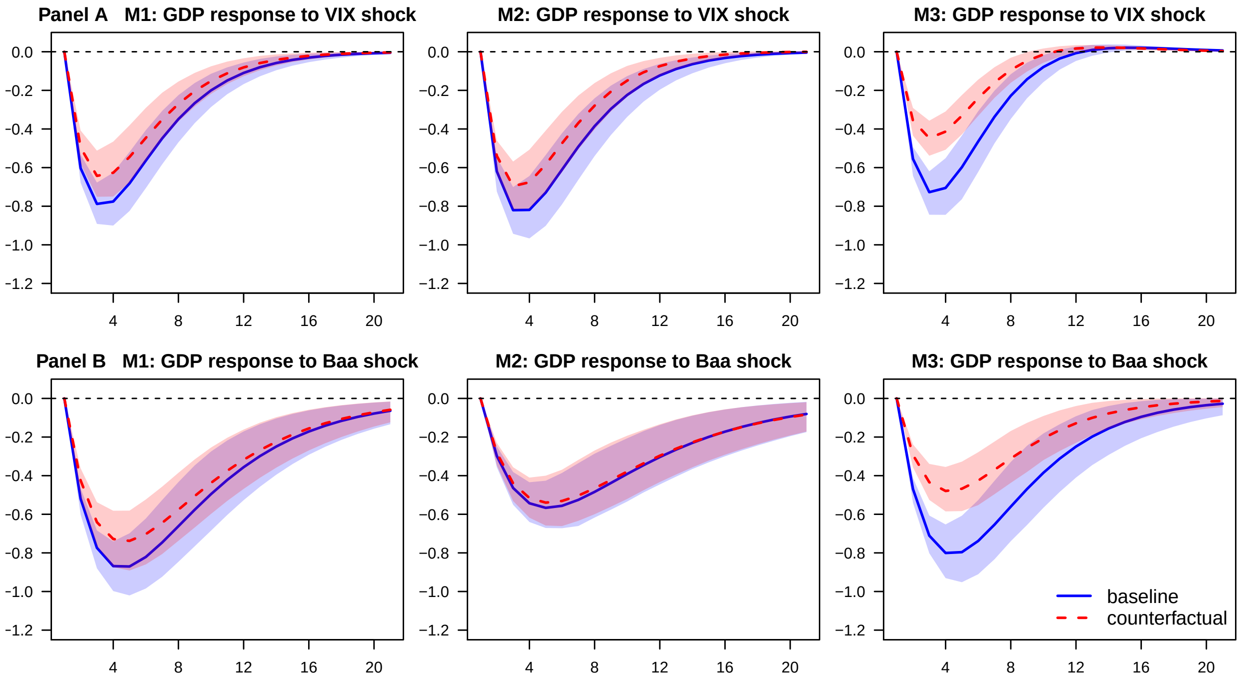
Notes: The table shows the fraction of real GDP growth variance explained by GDP, VIX, EFI, EMBI, and EqR shocks. M1-M3 denote baseline models, which allow feedback from changes in global risk to EFI, EMBI, or EqR. M1 counterfactual - M3 counterfactual denote models when EFI, EMBI, or EqR is assumed not to respond directly to changes in global risk, measured by the VIX index in Panel A and by the US Baa spread in Panel B. The sample period is 1999Q2-2017Q1 and includes EFI-5 countries.

Figure A.1: Impulse response functions of GDP growth to domestic financial variable shocks (EFI-5)



Notes: The figure shows impulse response functions of annual real GDP growth to a one standard deviation $\triangle EFI$, $\triangle EMBI$, and EqR shock. EqR displays a negative shock for comparison. M1, M2, and M3 in given columns denote 3-variable panel structural VAR models 1,2, and 3 shown in Table 2, estimated over the 1999Q2-2017Q2 period for EFI-5 countries. Global risk (GR) is proxied by the VIX index (VIX) in Panel A and by the US Baa corporate spread (Baa) in Panel B. The shaded areas represent 95% confidence bands obtained with bootstrapping.

Figure A.2: Impulse response functions of GDP growth to global risk shocks (EFI-5)



Notes: The figure shows impulse response functions of annual real GDP growth to a one standard deviation $\triangle GR$ shock, proxied by $\triangle VIX$ in Panel A and $\triangle Baa$ in Panel B. The baseline responses are depicted with a solid line. The dashed line represents a counterfactual scenario, when $\triangle EFI$ (M1), $\triangle EMBI$ (M2), and EqR (M3) is assumed not to respond to changes in $\triangle GR$. M1, M2, and M3 in given columns denote 3-variable panel structural VAR models 1,2, and 3 shown in Table 2, estimated over the 1999Q2-2017Q2 period for EFI-5 countries. The shaded areas represent 95% confidence bands obtained with bootstrapping.