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# The COVID-19 shock and long-term interest rates in emerging market economies

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A B S T R A C T

Motivated by a divergent behavior of long-term sovereign bond yields across emerging market economies in the onset of the COVID-19 pandemic, we employ the Bayesian model averaging to uncover the country-specific factors that explain those differences. The most pronounced determinants of a country's vulnerability to the COVID-19 shock were: (a) low GDP dynamics and (b) high sensitivity of bond yields to VIX in the period preceding the pandemic. Our results speak to the role of growth fundamentals in building-up the exposure to crises in emerging markets. They also signify a persistent differentiation of emerging economies by international investors.

## 1. Introduction

As the COVID-19 shock struck the world in the first quarter of 2020, the effects of the pandemic quickly manifested in financial markets (Goodell, 2020). Amidst worsening prospects of economic growth, the expected downturn in international trade, and general fears of a slowdown in the pace of globalization, investors shed risky assets and flew to safety. This tendency had an immediate impact on sovereign bond markets in emerging economies, changing the valuation of domestic assets. It also led to a hike in market interest rates, most notably long-term rates, one of the most important benchmarks for market participants and policymakers.

However, the theme of an abrupt reaction of long-term interest rates to global shocks periodically reoccurs in EMEs, especially since more of them began issuing large fractions of public debt securities in domestic currencies (Du and Schreger, 2016; Aizenman et al., 2020). The susceptibility of bond markets in EMEs to external factors was vividly exemplified by the taper tantrum episode of 2013 when the Federal Reserve announced the withdrawal of quantitative easing and triggered sell-offs in several important bond markets (Miyajima et al., 2015). There is now accumulating evidence on the lasting role of various global and domestic factors for portfolio capital flows to EMEs (Koepke, 2019), as well as international spillovers to those markets (Arezki and Liu, 2020). The most recent literature looks into the effects of the COVID-19 pandemic on bond markets and long-term interest rates in EMEs. Studies show that in the first half of 2020, EMEs were generally more vulnerable to capital outflows than advanced economies, while sovereign bond yields were affected more heavily than stock or foreign exchange markets (Beirne et al., 2020). Even though the research demonstrates that borrowing in local currencies did not insulate EMEs from the global turmoil (Hofmann et al., 2020), little is said about other

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country-specific factors that influence their reaction to this shock.

The case of EMEs at the onset of the COVID-19 period becomes particularly intriguing when we inspect a cross-section of long-term interest rates in a group of 23 such economies.[1] Fig. 1 juxtaposes the level of 10-year sovereign bond yields before the pandemic outbreak (end-February) and the maximum change (increase) in bond yields in the aftermath of the COVID-19 shock. The most noticeable feature of this relationship is that the hikes in interest rates are by no means proportional to their pre-crisis level. On the contrary, even though many of the points are clustered in the south-west part of the graph, its shape resembles an opening funnel, with the variance of changes in interest rates (y-axis) increasing with the initial yield level (x-axis). For example, five countries with initial interest rates levels of around 6% exhibit corresponding changes ranging from 0.124 (India), around 1.5-2 (Indonesia, Mexico, and Russia) up to 3.060 points (Brazil). It follows that there is no stable, linear pattern in this relationship, and some other factors that surpass the information contained in their pre-crisis level of interest rates differentiate the reaction of bond markets in EMEs to the shock.

Motivated by the puzzling distribution of long-term interest rates in EMEs, this paper sets out to explain this irregular behavior. Hence, the main question that we address in this study is: what made some of the emerging countries more vulnerable to the COVID-19 shock and generated a stronger reaction in their long-term interest rates? Using data on 23 major EMEs, we link the jumps in 10-year bond yield to numerous macroeconomic and financial characteristics of EMEs. Several Bayesian model averaging (BMA) specifications are tested to account for model uncertainty and extract the most relevant predictors.

The paper contributes to the existing literature in two ways. First, it adds to the burgeoning body of work on financial and economic consequences of the COVID-19 shock by providing novel evidence on the behavior of long-term interest rates in a wide sample of EMEs, using a parsimonious but rigorous empirical setting. Second, the paper explores more general implications of the COVID-19 episode. The empirical results are related the principal themes in the literature on international macrofinancial linkages and policy issues faced by EMEs, such as the role of external shocks for these economies or the development of local currency bond markets.

## 2. Empirical setting and data

We base our empirical approach on a cross-sectional regression model in which the dependent variable ($y$) is defined as the maximum increase in the 10-year sovereign bond yields in EMEs over March and April 2020 relative to its value on February 28, 2020. As explained, such a variable allows us to capture the highest impact of the pandemic on each of the $N = 23$ bond markets. The regression model takes a form of:

$$y = \alpha + X\beta + \varepsilon \qquad \varepsilon \sim i.i.\mathcal{N}\left(0, \sigma^2 I\right), \tag{1}$$

where $\alpha$ is an intercept, $\beta$ denotes a $K \times 1$ vector of coefficients, and $\varepsilon$ are normally distributed errors with variance $\sigma^2$. The $N \times K$ matrix $X$ contains predictors that may explain differences in $y$ across EMEs.

Because we deal with numerous potential predictors and do not have clear guidelines regarding the specific form of the empirical model, the Bayesian model averaging seems to be a suitable choice for this study. Various papers provide a detailed discussion of this method, along with its applications (Błażejowski et al., 2016; Beck, 2019). There is also an animated discussion on the limitations and uncertainty specific to the use of BMA in model comparison exercises (Vehtari et al., 2019). In a nutshell, BMA starts by estimating $2^K$ regression models using all possible subsets of $K$ predictors. Next, the models are weighted using the Bayes' theorem, and the posterior distribution of coefficients $\beta$ is obtained as:

$$p(\beta|y, X) = \sum_{s=1}^{2^K} p(\beta|M_s, y, X)p(M_s|y, X). \tag{2}$$

Here $p(\beta|M_s, y, X)$ denotes conditional distribution of $\beta$ in a given model $M_s$, while $p(M_s|y, X)$ is the posterior probability of that model. Finally, we calculate posterior moments of the coefficients and inclusion probabilities for each covariate in $X$.

The predictors are selected using previous theoretical and empirical work in the field. Depending on the availability of individual series, we build a set of regressors based on data covering the period before the COVID-19 crisis but post-2014, due to a probable structural change in the sensitivity of interest rates in EMEs to global shocks following the taper tantrum episode (Caballero and Kamber, 2019). They are listed in Table 1 and may be roughly divided into three groups. In the first one, we include the benchmark nominal 10-year bond yield before the COVID-19 shock (*rate_before*) and two properties of interest rates in each country, their average day-to-day change and standard deviation from 2014 to 2019. The *rate_sens* variable approximates the sensitivity of a given bond yield to the global risk factors, constructed as a simple correlation between its daily changes and VIX (Habib et al., 2020). The second group consists of macroeconomic indicators: GDP level and growth, as well as current account balance and government lending to GDP that influence financing needs and perceived risk of an economy. The third group comprises variables related to economic and financial policies: measures of financial development, financial account openness, and exchange rate regime that approximate a country's ability to react to or provide insulation from external shocks. Additionally, the *polity* variable measures the political risk of a given country, which may also alter the confidence and reactions of foreign investors.

[1] Brazil, Chile, China, Czechia, Egypt, Hungary, India, Indonesia, Israel, Kenya, Korea, Malaysia, Mexico, Nigeria, Peru, the Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, and Vietnam.

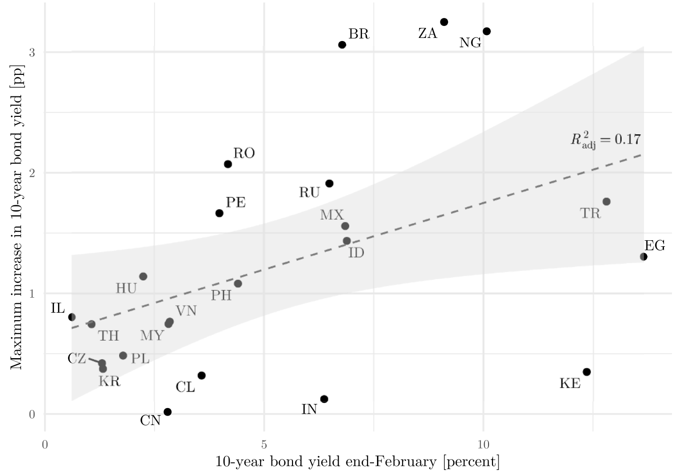


**Fig. 1.** Relationship between 10-year bond yield levels before the COVID-19 and the maximum increase of bond yield following the global shock. Notes: maximum increase in 10-year yield from March 9 to April 30 relative to February 28, 2020; dashed line: OLS regression slope; shaded area: smoothed 95-percent confidence interval calculated with a locally weighted regression; adjusted $R^2$ based on an OLS regression; data source: Datastream.

**Table 1**
Predictors included in the Bayesian model averaging.

| Variable | Description | Source |
|---|---|---|
| *rate_before* | 10-year nominal sovereign bond yield, benchmark (end-February 2020) | Datastream |
| *rate_ch* | Daily change in 10-year bond yield (average; 2014-2019) | Datastream |
| *rate_std* | Standard deviation of daily changes in 10-year bond yield (2014-2019) | Datastream |
| *rate_sens* | Correlation between daily changes in 10-year bond yields and CBOE VIX (2014-2019) | Datastream |
| *frag_five* | 'Fragile five' economies during the taper tantrum episode of 2013; dummy; Brazil, India, Indonesia, South Africa, and Turkey | Coined by Morgan Stanley |
| *gdp* | Gross domestic product; PPP, international dollars, current prices (2018) | IMF WEO |
| *gdp_growth* | Real GDP annual growth rate (average; 2014-2018) | IMF WEO |
| *cab* | Current account balance to GDP (average; 2014-2018) | IMF WEO |
| *govt_lend* | General government lending to GDP (average; 2014-2018) | IMF WEO |
| *fin_dev* | Financial development index; overall (2017) | World Bank |
| *ka_open* | De jure index of capital account openness; normalized dummy (2017) | Chinn and Ito (2006) |
| *fx_reg* | De facto foreign exchange regime classification; dummy (2019) | Dąbrowski et al., 2020 |
| *reserves_gdp* | Foreign exchange reserves (total reserves excluding gold) to GDP (average; 2014-2018) | IMF IFS |
| *macropru* | Index of macroprudential policy, based on a number of instruments (2017) | Cerutti et al. (2017) |
| *polity* | Polity index; dummy based on a country's political regime (2018) | Polity5; Center for Systemic Peace |

The BMA results are contingent on several choices regarding the prior distributions of regression parameters and the model size. Following most of the recent studies, we consider two types of conventional Zellner's *g*-priors for parameters: unit information prior and risk inflation criterion. However, due to the fact that large fixed values of *g* may concentrate the posterior mass on a few best-performing models, we additionally test two hyper-*g* priors with a beta-distributed shrinkage factor, which can be thought of as more data-dependent. With respect to model priors, we include two specifications universally used in the literature, uniform and binomial beta distributions. The former concentrates posterior model mass on intermediate model sizes, while the latter setting produces a flat distribution over the number of covariates in the model. Because there are no reasons to discriminate against certain model sizes, the binomial beta prior reflects our uncertainty about the appropriate subset of predictors in the regression. Altogether this allows us to corroborate our results under different prior choices. To answer our main research question, we maintain the *rate_before* regressor fixed in all tested models. The estimation is performed using the BMS package in R (Zeugner and Feldkircher, 2015). As we deal with a moderate number of 14 predictors (excluding the fixed one), it remains feasible to evaluate all possible subsets of models without resorting to numerical simulations.

## 3. Bayesian model averaging results

Taking into consideration all the parameter and model priors, we conduct the BMA analysis. Table 2 reports posterior inclusion probabilities (PIP) for each of those eight configurations. The PIP statistic provides information on how likely is a given variable to be included in the regression model. It must be noted right away that apart from the fixed regressor *rate_before*, there are only two

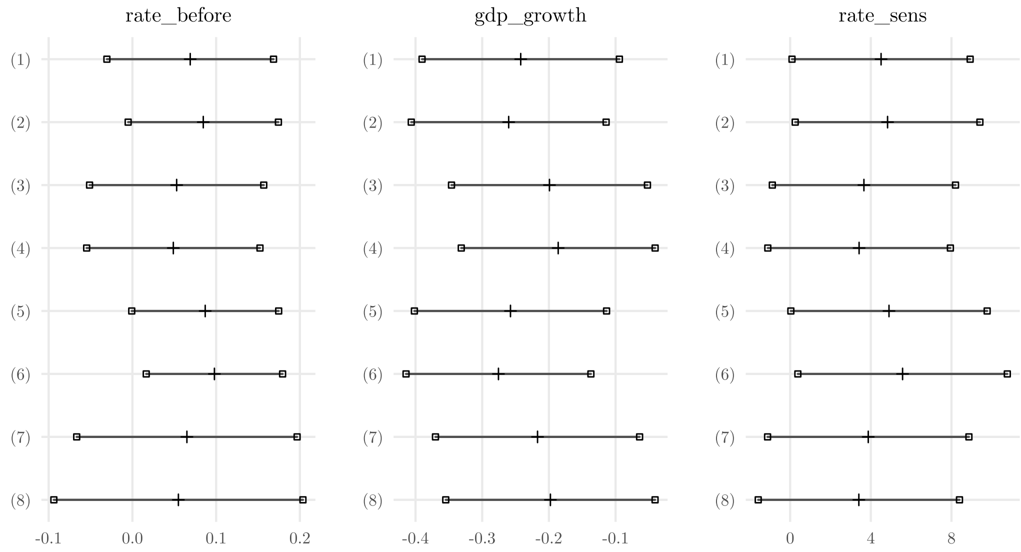


**Fig. 2.** Posterior bounds for coefficients on top three predictors in all BMA specifications.
Notes: numbers (1) - (8) denote the BMA settings characterized in Table 2; posterior bounds are based on coefficients conditional on inclusion of a given predictor and defined as posterior mean (marked on the interval) ±2 posterior standard deviations.

variables with the PIP higher than 0.5 in any of the BMA specifications, *gdp_growth* and *rate_sens*. The first one, however, has a considerably higher inclusion probability, approaching one in settings (3) and (4). Evidence for the inclusion of the *rate_sens* variable is more compelling under the uniform model prior (0.706). Specifications (1) to (4) are also more supportive of the remaining regressors, such as *fx_reg* and *fi_dev*, but none of them reach acceptable inclusion statistics.

In the next step, we evaluate posterior bounds for the fixed predictor and two robust covariates (Fig. 2). The coefficient on *rate_before* exhibits positive posterior mean values that range between 0.049 and 0.098. However, the posterior bounds are vast and stretch to the negative territory in as many as six cases, particularly for the binomial-beta prior and flexible hyperparameters. The coefficient on *gdp_growth*, which turns out to be the most robust predictor, is characterized by posterior densities located entirely below zero, clearly indicating a negative sign on this variable. Posterior bounds are wider for *rate_sens*, with a minimum of -1.583 and a maximum of 10.768. Still, they overlap with zero in four out of eight BMA settings, meaning that this variable may become insignificant in some regression specifications.[2]

Having established a set of the most robust predictors and their expected signs, we come back to our motivating empirical evidence and examine how the relationship between 10-year bond yield levels and their hikes changes once augmented with the robust variables (Table 3). As a benchmark, we report the univariate regression, estimated just with *rate_before* as a predictor. Regression (1) explains merely 16.8% of the variance in long-term interest rate changes post-COVID-19 shock, and the estimated slope may be considered only marginally significant at the 5-percent significance level. What is more, this specification delivers biased results due to the heteroskedastic distribution of residuals, specifically their increasing variance, the problem we pointed out when inspecting Fig. 1. Specifications (2) and (3) that include, one at a time, the robust regressors, *gdp_growth* and *rate_sens*, both produce goodness-of-fit superior to that of the initial model. In regressions (4)-(7), we obtain even larger coefficients of determination, going as high as 60% and providing a better understanding of the sources of differentiation in the dependent variable. What is equally important, the inclusion of either of two additional variables resolves the issue of heteroskedasticity from the baseline specification. A comparison of two nested regression, (4) and (7), indicates that there are some marginal gains from including the *rate_sens* variable in the full model, even though its p-value is slightly higher than 0.05.

## 4. Discussion and policy implications

The most striking feature of our empirical results is that roughly 2/3 of the cross-sectional variability in the reaction of 10-year bond yields in EMEs to the pandemic can be explained by just three factors: the preceding level of yield, the rate of economic growth before the shock, and past sensitivity of interest rates to VIX. The analysis strongly suggests that EMEs marked by slow pre-crisis growth proved to be less resilient to the COVID-19 shock. On this point, we find support for the role of strong macroeconomics fundamentals for EMEs during crises, documented by Ahmed et al. (2017), among others. A likely explanation for the inclusion of the

[2] One caveat of the presented results is that the *rate_sens* variable may, on its own, contain too much information on a given bond market and make other variables redundant. However, when we modify the overall BMA specification, exclude this variable from the set of predictors and treat *rate_before* as a regular (not a fixed) regressor, *gdp_growth* remains the only robust predictor, with the PIP higher than 0.5. If we further remove *gdp_growth*, none of the predictors remain robust. Those results are available upon request.

**Table 2**
Bayesian model averaging: posterior inclusion probabilities.

| | Model prior: uniform | | | | Model prior: binomial-beta | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| g-prior | UIP | RIC | HG-3 | HG-4 | UIP | RIC | HG-3 | HG-4 |
| *gdp_growth* | 0.989 | 0.953 | 0.997 | 0.999 | 0.893 | 0.809 | 0.830 | 0.791 |
| *rate_sens* | 0.637 | 0.416 | 0.700 | 0.706 | 0.285 | 0.131 | 0.369 | 0.397 |
| *fx_reg* | 0.312 | 0.145 | 0.391 | 0.397 | 0.090 | 0.021 | 0.179 | 0.222 |
| *fi_dev* | 0.308 | 0.130 | 0.397 | 0.409 | 0.082 | 0.019 | 0.173 | 0.214 |
| *frag_five* | 0.247 | 0.123 | 0.298 | 0.303 | 0.083 | 0.024 | 0.171 | 0.220 |
| *ka_open* | 0.227 | 0.094 | 0.303 | 0.315 | 0.064 | 0.017 | 0.152 | 0.200 |
| *govt_lend* | 0.151 | 0.069 | 0.185 | 0.188 | 0.048 | 0.013 | 0.141 | 0.179 |
| *gdp* | 0.147 | 0.074 | 0.171 | 0.179 | 0.052 | 0.015 | 0.131 | 0.189 |
| *polity* | 0.123 | 0.059 | 0.170 | 0.179 | 0.042 | 0.012 | 0.127 | 0.175 |
| *rate_ch* | 0.121 | 0.060 | 0.152 | 0.158 | 0.042 | 0.012 | 0.124 | 0.176 |
| *cab* | 0.120 | 0.058 | 0.152 | 0.158 | 0.041 | 0.011 | 0.124 | 0.170 |
| *macropru* | 0.113 | 0.057 | 0.143 | 0.149 | 0.040 | 0.011 | 0.123 | 0.170 |
| *reserves_gdp* | 0.111 | 0.063 | 0.140 | 0.144 | 0.044 | 0.013 | 0.121 | 0.171 |
| *rate_std* | 0.100 | 0.055 | 0.131 | 0.135 | 0.039 | 0.011 | 0.118 | 0.165 |

Notes: dependent variable: maximum increase in 10-year bond yield following the COVID-19 shock; the *rate_before* variable is included in all model subsets; parameter priors: UIP - unit information prior, RIC - risk inflation criterion, HG-3 and HG-4 - hyper-g priors with hyperparameters set to 3 and 4, respectively; intercept is not tabulated.

past bond yields sensitivity to VIX is that market participants differentiate or even stigmatize some emerging markets, based on their past performance. Consequently, portfolio capital flows to and from EMEs become more procyclical and fickle, especially in periods of elevated uncertainty. This finding echoes Eichengreen et al. (2019), who show that the international status of a currency is path-dependent. However, such inertia seems not to be complete, as not all of the 'fragile five' economies in our sample were doomed to repeat the strong reaction of their bond markets to a global shock.

Taken together, our results lend support to the notion that the 'original sin' problem, historically faced by EMEs, has morphed into a new kind of challenge (Hofmann et al., 2020; Aizenman et al., 2020). Even though the inability of EMEs to issue debt in their local currencies largely subsided since the 2000s, their country-specific risks were transferred to balance sheets of lenders, specifically foreign investors, who adjust their portfolios in a 'risk-on/risk-off' fashion, periodically entering and exiting bond markets in EMEs. Hence, during extreme market events, such as the pandemic outbreak, the pre-existing vulnerabilities seem to amplify the reaction of EMEs to international shocks. In this regard, our results also suggest that 'riskier' EMEs, ones that proved less resilient to an abrupt increase in long-term interest rates during the COVID-19 pandemic, obtain smaller gains from the financial globalisation than 'safer' ones, despite the development of their bond markets and general improvement in macroeconomic policies. This, in turn, may be related to the chronic inability of many of the EMEs to supply safe assets, securities that would prevent occasional retrenchments of capital by foreign investors (Brunnermeier and Huang, 2018).

On the other hand, the empirical analysis reveals that several factors which could further account for the idiosyncrasies in long-term bond yield hikes turned out not to be decisive during the COVID-19 episode. A notable example is the current account deficit, found to be a relevant measure of EMEs' exposure to financial spillovers in some previous studies (Chen et al., 2014). Another unexpected finding is that the floating exchange rate regime seems not to have helped in insulating EMEs from the COVID-19 shock. Although this conclusion must be treated with caution, due to a limited scope of our empirical analysis, it suggests that policymakers who try to reduce EMEs' vulnerabilities to external shocks may face a shortage of sufficient macroeconomic policy tools, as implied by the global financial cycle hypothesis formulated in Rey (2015). In this regard, our results highlight the likely limitations of policy

**Table 3**
Regression models using robust predictors selected with the BMA.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| *Intercept* | 0.645 | 2.376 | 0.860 | 1.782 | 0.546 | 1.786 | 1.485 |
| | [0.008] | [0.000] | [0.000] | [0.000] | [0.054] | [0.000] | [0.000] |
| rate_before | 0.110 | | | 0.102 | 0.068 | | 0.078 |
| | [0.047] | | | [0.009] | [0.120] | | [0.036] |
| gdp_growth | | -0.293 | | -0.282 | | -0.210 | -0.223 |
| | | [0.001] | | [0.000] | | [0.011] | [0.004] |
| rate_sens | | | 8.487 | | 7.257 | 5.945 | 4.373 |
| | | | [0.001] | | [0.006] | [0.014] | [0.053] |
| $R^2$ (adj) | 0.168 | 0.376 | 0.363 | 0.537 | 0.410 | 0.520 | 0.602 |
| BGP (p-value) | 0.010 | 0.089 | 0.241 | 0.472 | 0.341 | 0.606 | 0.802 |
| JB (p-value) | 0.789 | 0.810 | 0.710 | 0.857 | 0.860 | 0.617 | 0.638 |

Notes: dependent variable: maximum increase in 10-year bond yield following the COVID-19 shock; p-values in brackets; Breusch-Godfrey-Pagan test: null hypothesis of homoskedasticity of residuals; Jarque-Bera test: null hypothesis of normality of residuals; Huber-White heteroscedasticity-consistent standard errors calculated in regression (1).

instruments available to EMEs during crises but do not speak against searching for more effective stabilization tools.

## 5. Conclusion

This paper aimed to investigate the effects of the financial shock brought about by the COVID-19 pandemic for long-term interest rates in 23 major EMEs. Those effects turned out to be highly divergent across economies and called for an exploration of factors that explain such dissimilarities. Using model averaging methods, we find that the most pronounced determinants of a country's vulnerability to the COVID-19 shock were: low GDP dynamics and high sensitivity of sovereign bond yields to VIX in the period preceding the pandemic. Our results confirm the role of growth fundamentals in building-up the exposure to crises in EMEs and the persistent differentiation of economies by global investors, based on the past resilience of a country's bond markets to external risk-off shocks.

In this study, we have not examined an important link between exchange rates and financial flows, potential cross-country contagion effects, as well as the policy responses to the COVID-19 shock in EMEs. All of those areas warrant further research.

## Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## References

Ahmed, S., Coulibaly, B., Zlate, A., 2017. International financial spillovers to emerging market economies: How important are economic fundamentals? Journal of International Money and Finance 76, 133–152. https://doi.org/10.1016/j.jimonfin.2017.05.001.

Aizenman, J., Jinjarak, Y., Park, D., Zheng, H., 2020. Good-Bye Original Sin, Hello Risk On-Off, Financial Fragility, and Crises? NBER Working Paper Series 27030. https://doi.org/10.3386/w27030.

Arezki, R., Liu, Y., 2020. On the (Changing) asymmetry of global spillovers: Emerging markets vs. advanced economies. Journal of International Money and Finance 107, 102219. https://doi.org/10.1016/j.jimonfin.2020.102219.

Beck, K., 2019. What drives business cycle synchronization? BMA results from the European Union. Baltic Journal of Economics 19 (2), 248–275. https://doi.org/10.1080/1406099X.2019.1652393.

Beirne, J.B., Renzhi, N., Sugandi, E.A., Volz, U., 2020. Financial Market and Capital Flow Dynamics During the COVID-19 Pandemic. ADBI Working Papers 1158.

Błażejowski, M., Gazda, J., Kwiatkowski, J., 2016. Bayesian model averaging in the studies on economic growth in the EU regions Application of the gretl BMA package. Economics and Sociology 9 (4), 168–175. https://doi.org/10.14254/2071-789X.2016/9-4/10.

Brunnermeier, M.K., Huang, L., 2018. A Global Safe Asset for and from Emerging Market Economies. NBER Working Paper Series 25373. https://doi.org/10.3386/w25373.

Caballero, R., Kamber, G., 2019. On the global impact of risk-off shocks and policy put frameworks. BIS Working Papers 772.

Cerutti, E., Claessens, S., Laeven, L., 2017. The use and effectiveness of macroprudential policies: New evidence. Journal of Financial Stability 28, 203–224. https://doi.org/10.1016/j.jfs.2015.10.004.

Chen, J., Mancini Griffoli, T., Sahay, R., 2014. Spillovers from United States Monetary Policy on Emerging Markets: Different This Time? IMF Working Papers 14 (240). https://doi.org/10.5089/9781498380423.001.

Chinn, M.D., Ito, H., 2006. What matters for financial development? Capital controls, institutions, and interactions. Journal of Development Economics 81 (1), 163–192. https://doi.org/10.1016/j.jdeveco.2005.05.010.

Dąbrowski, M.A., Papież, M., Śmiech, S., 2020. Classifying de facto exchange rate regimes of financially open and closed economies: A statistical approach. Journal of International Trade and Economic Development 29 (7), 821–849. https://doi.org/10.1080/09638199.2020.1748692.

Du, W., Schreger, J., 2016. Local Currency Sovereign Risk. Journal of Finance 71 (3), 1027–1070. https://doi.org/10.1111/jofi.12389.

Eichengreen, B., Mehl, A., Chiu, L., 2019. Mars or Mercury? The geopolitics of international currency choice. Economic Policy 34 (98), 315–363. https://doi.org/10.1093/epolic/eiz005.

Goodell, J.W., 2020. COVID-19 and finance: Agendas for future research. Finance Research Letters 35, 101512. https://doi.org/10.1016/j.frl.2020.101512.

Habib, M.M., Stracca, L., Venditti, F., 2020. The fundamentals of safe assets. Journal of International Money and Finance 102, 102–119. https://doi.org/10.1016/j.jimonfin.2019.102119.

Hofmann, B., Shim, I., Shin, H.S., 2020. Emerging market economy exchange rates and local currency bond markets amid the Covid-19 pandemic. BIS Bulletin 5, April.

Koepke, R., 2019. What drives capital flows to emerging markets? A survey of the empirical literature. Journal of Economic Surveys 33 (2), 516–540. https://doi.org/10.1111/joes.12273.

Miyajima, K., Mohanty, M.S., Chan, T., 2015. Emerging market local currency bonds: Diversification and stability. Emerging Markets Review 22, 126–139. https://doi.org/10.1016/j.ememar.2014.09.006.

Rey, H., 2015. Dilemma not Trilemma : The Global Financial Cycle and Monetary Policy Independence. NBER Working Paper Series 21162. https://doi.org/10.3386/w21162.

Vehtari, A., Simpson, D.P., Yao, Y., Gelman, A., 2019. Limitations of Limitations of Bayesian Leave-one-out Cross-Validation for Model Selectiong. Computational Brain & Behavior 2 (1), 22–27. https://doi.org/10.1007/s42113-018-0020-6.

Zeugner, S., Feldkircher, M., 2015. Bayesian model averaging employing fixed and flexible priors: The BMS package for R. Journal of Statistical Software 68 (4). https://doi.org/10.18637/jss.v068.i04.