

Corporate Bond Issuance Over Financial Stress

Episodes: A Global Perspective

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Abstract

A new era of abundant global liquidity and the maturation of domestic capital markets has transformed corporate bond financing in emerging economies. We show that these forces enabled firms in several EMEs, especially in East Asia, to access bond markets with levels of market access comparable to advanced economies during global financial stress brought on by the COVID-19 pandemic. This sustained funding capacity, fueled by accommodative liquidity spillovers, was however accompanied by rising financial vulnerabilities, highlighting the double-edged nature of market deepening.

JEL Codes: F30, G15, G30.

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1 Introduction

The Global Financial Crisis of 2007–09 marked a watershed in financial markets, catalyzing a “second phase of global liquidity” (Shin, 2013) characterized by a structural shift from bank-dominated funding to market-based debt financing. In this new era, corporate bond markets surged, with non-financial corporate debt in EMEs doubling as a share of GDP between 2009 and 2020 (Aldasoro, Hardy, and Tarashev, 2021). Yet this boom coincided with increases in financial fragility indicators (Acharya et al., 2015 and Alfaro et al., 2019).

EMEs have also witnessed a transformation in their domestic capital markets. Over the past two decades, local currency bond markets have expanded significantly, particularly in East Asia, reducing firms’ reliance on foreign-currency debt (Mizen et al., 2021; Abraham et al., 2021). This evolution reflects deeper institutional reforms, such as pension system enhancements (Meh and Schmukler, 2025), and improved macroeconomic conditions (Hale, 2007; Burger et al., 2012). Crucially, local currency debt now functions as a “spare tire” during heightened volatility periods, allowing firms to maintain funding when dollar credit availability contracts (Avdjiev et al., 2024; Hale et al., 2020).

Despite this progress, a key question remains: have EMEs truly “graduated,” achieving resilience in corporate bond markets comparable to that of advanced economies, or do new vulnerabilities also accompany these gains? We use the term *graduation* in a deliberately narrow sense: the ability of firms to retain access to local-currency bond markets during a global stress episode, to an extent comparable to firms in advanced economies. The term pertains to market access, not to firms’ underlying balance-sheet resilience, a distinction that turns out to be central to our findings. In other words, it concerns whether the door to the market remained open, not whether firms could safely walk through it.

The COVID-19 pandemic presented an unprecedented stress test of EME bond market resilience. Our findings suggest that the answer is yes to both: while EMEs demonstrated

remarkable resilience in funding access during the pandemic, this came with mounting signs of corporate vulnerabilities.

In this paper, we investigate issuance patterns during COVID-19 relative to past stress episodes and track the evolution of post-issuance financial vulnerabilities using a comprehensive dataset of matched bond issuance and financial data for more than 60,000 firms from 45 countries. Crucially, our dataset linking issuance transactions to firm-level financial data allows us to move beyond aggregate capital raising and trace how global liquidity spillovers reached firms of different sizes and risk profiles. Following established literature (e.g., Kalemli-Özcan et al., 2022), we use country-by-industry fixed effects to absorb persistent differences in credit demand, credit risk, and industry composition across markets.

We begin by observing that firms across nearly all regions worldwide were more likely to access the corporate bond market at the onset of the COVID-19 pandemic compared to non-stress periods. This contrasts sharply with the behavior observed during the Global Financial Crisis globally and the taper tantrum in emerging markets, when a flight-to-safety dynamic dominated and issuance propensity declined.

However, market resilience varied significantly across countries and bond market segments during the COVID-19 pandemic. Local currency issuance, particularly by firms in emerging Asian economies, showed exceptional strength. Firms in these countries demonstrated graduation, maintaining local-currency market access previously seen only in advanced economies. Furthermore, unlike during the GFC and taper tantrum, when emerging Asian firms outside of China reduced their dollar-denominated issuance, these firms during COVID maintained dollar issuance at levels comparable to non-stress periods.

Yet this graduation did not mean that the composition of firms accessing markets was the same as in advanced economies; the composition reflected the influence of abundant liquidity outweighing flight-to-quality discipline. Unlike in advanced economies, where issuance re-

silience was concentrated among large and low-risk firms, the surge in local currency issuance in emerging Asia outside of China was significantly less discriminating: even medium-sized firms and those with high refinancing needs (firms typically rationed during global stress) were able to issue. This breadth of access points to a supply-side force, namely abundant global liquidity channeled through deep local markets, that kept funding open to a wider range of borrowers than a flight to quality would predict. Conversely, Latin American firms showed a significant contraction in bond issuance propensity during the pandemic, diverging sharply from the expansion seen in emerging Asia.

What accounts for the cross-country variation in emerging markets' ability to take advantage of this liquidity? We find that greater pre-pandemic financial market development was decisive: the global liquidity spillover translated into sustained local-currency issuance primarily in those markets that were already deep enough to channel it. The COVID experience thus underscores the crucial role of a country's financial development in shaping firms' access to capital.

This broad-based access to financing, apparently reflecting abundant liquidity rather than firm creditworthiness, came at a cost. Bonds issued by Asian emerging market firms during COVID experienced spread increases that were statistically indistinguishable from spread increases seen during the GFC, suggesting investors recognized elevated credit risk even as they continued to fund these borrowers. Beyond these immediate pricing signals, while the buoyancy of primary bond markets provided a vital lifeline against the liquidity shocks of the COVID-19 era, the surge in borrowing left firms more vulnerable to future shocks. Indeed, we find that companies in emerging Asia that tapped bond markets in 2020, subsequently experienced a deterioration in key financial vulnerability metrics compared to non-issuers.

Taken together, the COVID-19 episode serves as a lens through which we reassess the effects of the second phase of global liquidity and the maturation of local currency bond markets in EMEs, focusing on both their shock absorber function and the new vulnera-

bilities that accompany broader market access. The apparent graduation of some EMEs toward advanced-economy-like resilience emerges not as an unambiguous success, but as a double-edged development: deeper local markets stabilized funding conditions yet were accompanied by financial vulnerabilities associated with an era of abundant global liquidity.

Contribution and related literature.

The novel contribution of our work is that it reframes the “second phase” narrative through an international lens. The global liquidity surge amplified corporate financial fragility, suggesting that policy support, while effective in stabilizing markets, may have been followed by a build-up in firms’ underlying vulnerabilities. Our analysis thus offers a new perspective on post-GFC financial integration and development, highlighting how the maturation of local currency bond markets in EMEs, though central to their resilience during global shocks, brings with it a new set of stability challenges that warrant close monitoring as global conditions evolve.

Our study contributes to two main strains of the literature. First, we contribute to the literature on EMEs financing. In the sovereign bonds space, the 2025 Global Financial Stability Report (International Monetary Fund, 2025) documents that emerging markets with stronger fundamentals have increasingly shifted toward local currency debt issuance absorbed by resident investors, which has enhanced resilience to global shocks. However, when EMEs issue in local currency, risk does not disappear, but shifts to global investors, who must manage currency movements alongside underlying local currency returns. In markets where global investors account for a large share of the investor base, exchange rate fluctuations can drive substantial outflows and ultimately drive domestic yields higher (Bertaut et al., 2025).

In the corporate bond space, studies have found that local currency corporate bond issuance has increased in recent decades, particularly in Asian EMs (Abraham et al., 2021), as EM

firms have been able to overcome the “original sin” of being unable to issue bonds domestically (Mizen et al., 2021). This expansion reflects the institutional maturation documented by Burger et al. (2012), who show how macroeconomic stability and protection of creditor rights enabled EME bond market development. Such firms now use local currency bond markets as a “spare tire” during exchange rate volatility (Avdjiev et al., 2024), though this debt growth may amplify financial fragility (Alfaro et al., 2019). Additionally, some small countries’ firms have been able to issue bonds in their home currency even when issuing bonds abroad (Hale et al., 2020).

We contribute to the corporate bonds literature by showing how, in the presence of new institutional characteristics and favorable global liquidity conditions, firms in at least some EMEs now behave like their counterparts in advanced economies when faced with a global shock. A large literature documents that U.S. monetary easing spills over to emerging-market credit conditions via global intermediaries and risk-taking, amplifying EME credit cycles (Bräuning and Ivashina, 2020). Our paper advances the understanding of how global liquidity shapes financial conditions worldwide, particularly in the post-GFC era marked by a structural shift from bank lending to bond markets, a transformation that was most pronounced for EME borrowers (Avdjiev et al., 2025). Accordingly, evidence indicates that shifts in global liquidity and conditions are strong predictors of corporate distress risk in these markets (Asis et al., 2021). We complement the global credit-cycle evidence by showing that, during COVID, spillovers manifested also through primary corporate bond markets, most notably via local-currency issuance in emerging Asia.

Second, our cross-country analysis contributes to the analysis of policy efficacy in a global context. These effects have been studied both in the context of COVID policies in the U.S. by, among others, Becker and Benmelech (forthcoming) and Boyarchenko et al. (2022), and in the euro area by Darmouni and Papoutsis (2025) and in the context of earlier credit market support programs by ECB and BOE (see, for instance, Todorov (2020) and Kitsul et al.

(forthcoming)). Relatedly, Acosta-Henao et al. (2025) show that government interventions can substitute for impaired market financing during sudden stops, particularly by lowering domestic debt costs for eligible firms.

In our study we highlight that longer-term financial-stability and macroeconomic implications of such policies will depend on how companies' balance sheets evolve. For instance, Kalemli-Özcan et al. (2022) show that, when financial turbulence arises, corporate investment by European firms collapses following a boom period during which those firms borrowed heavily. Ivashina et al. (2024) demonstrate that corporate debt build-ups can be central to boom-bust dynamics and crisis risk. Thus, tracking firms' financial outcomes over time, as we do in our study, is the first step to understanding such longer-term effects.

More broadly, this paper offers a global perspective on the evolution of corporate bond issuance and firm behavior during financial stress, documenting how firms worldwide have adapted to new funding realities and market shocks. Traditionally, periods of financial turmoil have been marked by investor risk aversion and a retreat to high-quality assets, constraining firms' access to capital markets and amplifying funding challenges. For instance, Campello et al. (2010) showed severe credit rationing where constrained firms face investment cuts and liquidity depletion.

Our findings reveal a striking departure from this pattern during the COVID-19 pandemic, as Asian EM firms, including those with elevated refinancing needs, maintained robust market access in local currency markets. The paper's novel contribution lies in its comparison of advanced and emerging economies, showing that EMEs, long seen as vulnerable to global capital flow volatility and exposed to risks associated with financial globalization (Abraham and Schmukler, 2017), have benefited from deeper capital markets and institutional reforms, narrowing the gap with high-income countries in market access (Meh and Schmukler, 2025). Nevertheless, challenges remain for EMEs: the inability to borrow abroad in local currency still persists for many (Eichengreen et al., 2023), and improvements remain uneven and

closely tied to institutional development. This underscores the ongoing need for vigilance in transparency, governance, and structural reforms to ensure that expanded market access translates into productive investment rather than rising corporate fragility.¹

2 Empirical Specification

2.1 Data and variables of interest

We use data on corporate bond issuance transactions from LSEG’s Debt New Issues (LSEG, a) for a sample period of January 1, 2005 to December 31, 2021.² The database covers transaction-level details for bond offerings from companies around the world. We exclude convertible debentures and preferred shares, as well as \$0 issuance and securities with less than 1 year to maturity at issuance.

We then match bond issuance data with firm-level annual financial statements from Worldscope Fundamentals (LSEG, b) for the years 2004-2023. We match first based on the ultimate parent’s Refinitiv Instrument Code (RIC), which can be found in both LSEG’s Debt New Issues and Worldscope Fundamentals. We then supplement additional matches based on firm name (Issuer/Borrower Name Full in LSEG’s Debt New Issues and Name in Worldscope Fundamentals). Some of the matches in this second step include subsidiary firms that have financial statements in Worldscope while the ultimate parent does not (e.g. PetroChina).

¹See Beck (2014) for a survey and reflections on the lessons from the GFC: *If there is one major lesson coming out of the very different papers and out of the more recent literature on financial institutions and markets in general, it is that finance can be as much a force for economic development as the root cause of systemic crises. Often the same mechanism that helps overcome agency problems and improve resource allocation can be a source of fragility. It might be thus difficult for the financial system to settle for the Goldilocks level of financial depth, neither too cold nor too hot. While financial deepening requires risk taking and risk transformation, agency problems, herding trends, and self-enforcing cycles push market participants to take on more risks than sustainable, effectively shifting risk, which ultimately results in financial fragility* (page 1)

²This data source was formerly known as Refinitiv Workspace for Investment Banking.

We focus on bond issuance activity by non-financial corporations by excluding from Worldscope all firms with an SIC code between 6000 and 6999. We also exclude public administration firms with an SIC code above 9000. Finally, we exclude firms in countries with fewer than 10 unique issuers over the sample period.

Our final matched dataset includes 60,421 firms from 45 countries, of which 6,058 issued at least one bond during our sample period (see Appendix A for a breakdown by country). Our matched dataset of 80,375 bonds totals US\$25.8 trillion in face value, which represents 75.5% of the number of and 97.3% of the face value of non-financial corporate bonds in Refinitiv Workspace.

Our main variables of interest concern monthly bond issuance at the firm level, comparing issuance decisions and firm characteristics during months with financial stress compared to months with no stress (“normal times”). We define our independent variables of interest as three dummies for the periods of financial stress, which take on a value of 1 in the following months:

- COVID pandemic: March to June 2020, inclusive;
- Taper tantrum: May 2013 to April 2014 inclusive; and
- Global financial crisis: December 2007 to June 2009, inclusive.

These months were chosen based on the likely impact on the bond markets. The GFC months were chosen based on the NBER-defined recession; the taper tantrum includes the May 2013 testimony by the Fed’s Chair, Ben Bernanke, which investors interpreted as signaling the unexpected start to the end of quantitative easing, and includes the subsequent slow-down in China and other EMs; and the COVID months include the four months where the VIX index was at an average monthly level above 30.

We first examine bond issuance decisions, such as the propensity to issue a bond (*issuerdummy*,

which takes on a value of 1 if the firm issues at least one bond in a month and 0 otherwise), and the dollar amount and number of bonds issued by a firm in a month. Issuance amounts are measured in constant 2011 U.S. dollars. We then examine issuance propensity after sorting firms based on their size in the year prior to issuance, proxied by log assets (the natural logarithm of total assets in USD, using 2011 constant U.S. dollars).

In a final set of analysis, we look at the evolution of measures of firm vulnerability after the onset of the COVID pandemic. We examine changes in book leverage (total debt divided by total assets), net debt (debt minus cash, divided by total assets), and Altman’s Z-score and Ohlson’s O-score (both measures designed to estimate a firm’s likelihood of default in the near future).

We perform our analysis for separate geographical areas: the euro area, other advanced economies, the United States, China, and other emerging market economies (EMs). In some analysis we further break down non-China EMs into Asia, Latin America and other.

Table 1: Summary statistics

Sample:	Euro area	Other AEs	U.S.	China	Other Asian EMs	Latam	Other EMs
<i>Panel A: Bond issuance details</i>							
Number of unique issuing firms	468	1,286	1,499	975	1,431	298	101
Number of firm-months with issuance	4,713	8,964	10,142	6,821	10,885	1,926	609
Average number of bonds	0.02	0.01	0.02	0.01	0.01	0.01	0.00
Average number of bonds ($\log$)	1.96	2.01	1.73	1.46	2.03	1.40	1.47
Average bond size (\$m)	\$10.1	\$2.6	\$8.8	\$3.3	\$0.9	\$5.8	\$1.3
Average bond size ($\log$ \$0m)	\$1,078.9	\$646.3	\$1,008.3	\$376.8	\$189.4	\$567.0	\$733.6
Weighted average maturity	8.53	8.95	11.44	6.10	5.26	8.12	8.08
<i>Panel B: Bond issuer characteristics</i>							
Log assets	10.25	9.73	9.31	9.13	8.89	8.97	10.37
Book leverage	35.6%	36.8%	38.3%	36.6%	37.2%	38.4%	31.8%
Profitability	3.2%	3.3%	3.7%	3.0%	2.7%	3.4%	5.5%
<i>Panel C: All firm characteristics</i>							
Number of unique firms	4,043	18,360	12,073	6,407	15,550	1,375	2,613
Number of unique firm-months	503,946	2,257,255	1,155,809	773,922	2,175,927	189,239	354,199
Log assets	5.36	4.28	4.07	5.94	4.84	6.42	5.06
Book leverage	24.8%	18.7%	27.3%	21.1%	23.8%	25.0%	23.9%
Tangibility	23.4%	30.1%	24.7%	26.5%	30.5%	39.2%	30.1%

Table 1 shows summary statistics for the full sample period, broken down by region. In Panel A, we describe the characteristics of bond issuance, including the regional breakdown of the 6,058 unique issuing firms. Our sample includes 17,542 bonds from nonfinancial corporations in the U.S.³ For firm-months that include issuance, the average amount of bonds issued is largest in the euro area at approximately \$1.1 billion, followed closely by the U.S. at approximately \$1.0 billion. Other EMs, other AEs, and Latam are smaller at \$734 million, \$646 million and \$567 million, respectively. Asian EM bonds are the smallest: average bonds in China and other Asian EMs are \$377 million and \$189 million, respectively. In terms of number of bonds issued, for months with positive issuance the average number of bonds issued is 2.01 in other AEs, 1.96 in the euro area, and 1.73 in the U.S. In the EMs, the number of bonds issued per month are 2.03 in non-China Asia, 1.47 in other EMs, 1.46 in China and 1.40 in Latam. Average initial time to maturity is longer in advanced economies (U.S. at 11.4 years, other AEs at 9.0 years and euro area at 8.5 years) and non-Asia EMs (8.1 years in both Latam and other EMs) relative to Asian economies (6.1 and 5.3 years in China and other Asian EMs, respectively). The majority of bonds in the U.S. and euro area are rated, while only around 40% of bonds in other AEs, Latam and other EMs are rated. Asia EMs have the lowest rating level: 12% and 10% of bonds are rated in China and other Asian EMs, respectively.

Panel B shows characteristics of bond issuing firms whereas Panel C shows characteristics of all firms. Not surprisingly, bond issuers are, on average, larger and more levered than the firms in the full sample. In terms of bond issuers, the small number of issuers from other EMs are the largest, least levered and most profitable; euro area firms are the second largest and second least levered. In the full sample, the average public firm in Latam is the largest, while the average public firm in other AEs is the least levered. U.S. firms are the smallest on average and have the highest leverage among the full sample of public firms.

³This number can be calculated as the number of firm-months with issuance (10,142) multiplied by the average number of bonds when issuing (1.73). Our sample size is close to the 17,379 bonds issued between 2002 and 2020 as described in Becker and Benmelech (forthcoming).

2.2 Regression specification

In order to test the relationship between issuance decisions and periods of financial stress, our regression specification takes on the following form:

$$y_{i,t} = \alpha + \beta * COVID + \delta * TT + \gamma * GFC + \lambda * t + \theta * size_{i,t} + \eta_{c*j} + \epsilon_{i,t}, \quad (1)$$

where $y_{i,t}$ is one of issuer dummy, dollar amount issued (converted using constant 2011 U.S. dollars), or number of bonds issued. In terms of our issuer dummy, we further specify in some regressions a dummy for issuance in a firm's local currency or in USD in a firm-month. All of these variables are defined for the full sample of firm-months. We run the analysis on an unbalanced panel, based on the fact that some firms enter and exit the sample, but for robustness we also re-run the analysis using only the firms with data for all years; the results remain qualitatively the same. β , δ and γ measure whether issuance decisions change during stress months relative to the rest of the sample period. In order to control for possible time trends, such as the growth of the corporate bond market over our sample period, we include a linear quarterly time trend captured by $\lambda * t$, and we control for firm size, which is time-varying and converted to U.S. dollars using constant 2011 exchange rates. In order to control for average country-industry differences in credit demand, as well as in other relevant factors, such as credit risk and industry structure, we include country-by-industry fixed effects $\eta_{c,j}$.⁴

⁴By including country-by-industry fixed effects, we broadly follow Kalemli-Özcan et al. (2022) when we, although we cannot interact country-industry fixed effects with year fixed effects as that would absorb the stress period dummies, our variables of interest.

3 Empirical Results

3.1 What does corporate bond issuance look like during periods of financial stress?

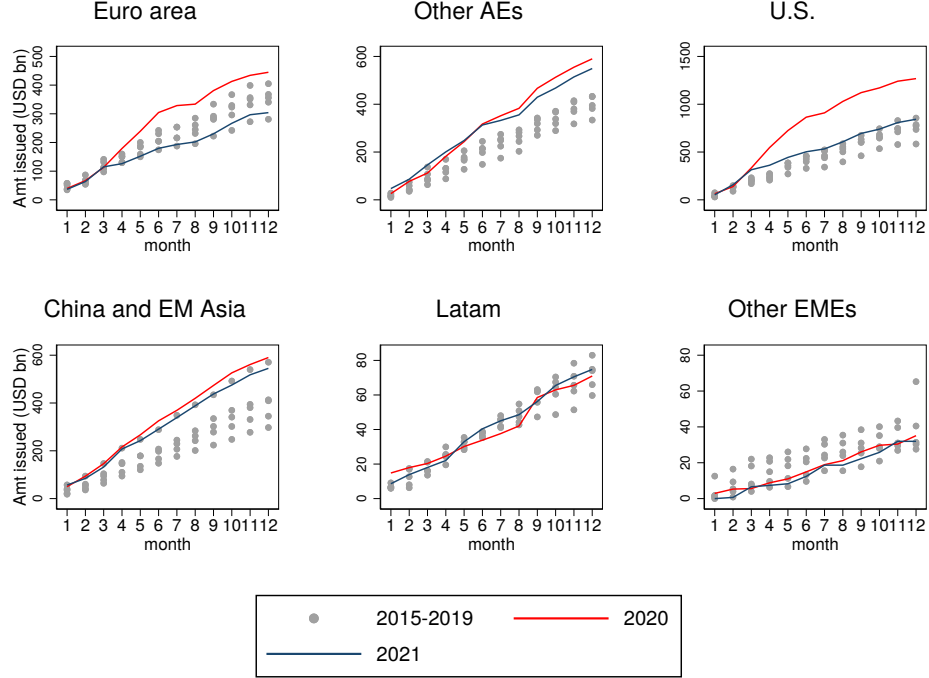
Figure 1, which compares cumulative monthly volumes of nonfinancial corporate bond issuance by year in different regions from 2015 to 2021, shows that total issuance surged to record or near-record levels in 2020 across almost all regions, despite the COVID pandemic. After a brief stall at the onset of the pandemic early in the year, cumulative amounts of bond issuance in 2020 (red line) exceeded cumulative issuance levels from each of the previous five years (gray dots) in almost all regions, except EMs outside of Asia (e.g., Latin America and other). For the U.S., this pattern is particularly pronounced and is in line with findings from previous literature (e.g., Halling et al. (2020)).

3.1.1 Issuance propensity during financial stress

We next formally test whether issuance patterns during COVID are different from non-stress times and other stress episodes using the regression in Equation (1). Table 2 uses the full panel of firm-months and examines as dependent variables the bond issuance propensity (issuer dummy) and dollar amount issued (adjusted for exchange rate effects). The first row in each panel shows the mean of each dependent variable during non-stress periods for the applicable region.

Figure 1: Total value of corporate bond issuance by year for 2015-2021

Annual U.S. dollar value of nonfinancial corporate bond issuance for 2015 to 2021. Includes issuance from firms in our matched sample. Source: Refinitiv Workspace.



In the first panel of Table 2, we examine issuance propensity, which we measure by using a dummy variable that takes on a value of 1 in months when a firm issues at least one bond and 0 otherwise. The first row shows that the average propensity during non-stress periods ranges from 0.40% to 0.93% depending on the region, with U.S. firms at 0.88%. In other words, out of a time period of 1000 months, an average firm accesses the bond market between 4 times (every 21 years) and 9 times (every 9 years).⁵ The coefficients represent the *change* in issuance propensity during the relevant time periods relative to non-stress periods (periods not captured by stress-period dummy variables), controlling for the linear time trend and firm size. Table 2 shows that a given firm's likelihood of issuing a bond increased significantly in most regions during the COVID pandemic months. We can assess economic significance

⁵This percentage includes all firm-months, even for those firms that never issue a bond. If we restrict the sample to firms that issue at least one bond over our sample period, the average issuance propensity per firm-month is between 4.0% and 5.6%, which corresponds to issuance every 2.1 and 1.5 years, respectively.

Table 2: Corporate bond issuance during periods of financial stress

This table shows panel regression results of bond issuance outcomes for the period from 2005 to 2021 for a global sample of public firms in Refinitiv Worldscope. The dependent variables are *Issuer dummy* (a dummy that takes on a value of 1 if a firm issues at least one bond in a month and 0 otherwise) and *Dollar amount issued* (total face value of bonds issued in a month by a firm, including \$0, measured in U.S. dollars using constant 2011 exchange rates). The independent variables of interest are the stress period dummies, defined in Section 2.1. The regressions include a linear quarterly time trend, log assets (converted to USD using constant 2011 dollars), and country-by-industry fixed effects, and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Euro area	Other AEs	U.S.	China	Other EMEs
<i>Dependent variable</i>	<i>Issuer dummy</i>	<i>Issuer dummy</i>	<i>Issuer dummy</i>	<i>Issuer dummy</i>	<i>Issuer dummy</i>
Mean	0.92%	0.40%	0.88%	0.93%	0.51%
COVID pandemic	0.00443*** (0.00129)	2.82e-05 (0.000316)	0.00992*** (0.000973)	0.00168** (0.000721)	0.000889*** (0.000321)
Taper tantrum	0.00219*** (0.000627)	0.000708*** (0.000196)	0.000798** (0.000345)	-0.00304*** (0.000449)	-0.00125*** (0.000175)
Global financial crisis	-0.000494 (0.000531)	-0.000324** (0.000144)	-0.000506** (0.000232)	0.000233 (0.000331)	-0.000133 (0.000160)
Linear time trend (qtr)	0.00219 (0.00163)	0.00347*** (0.000402)	0.00577*** (0.000884)	0.0150*** (0.00149)	0.00192*** (0.000541)
Log assets	0.00692*** (0.000690)	0.00283*** (0.000190)	0.00259*** (0.000147)	0.00685*** (0.000496)	0.00415*** (0.000273)
<i>Dependent variable</i>	<i>Dollar amount issued</i>	<i>Dollar amount issued</i>	<i>Dollar amount issued</i>	<i>Dollar amount issued</i>	<i>Dollar amount issued</i>
Mean	9.72	2.51	8.76	3.40	1.36
COVID pandemic	12.63*** (2.622)	1.693*** (0.633)	23.81*** (3.386)	1.236* (0.637)	0.154 (0.175)
Taper tantrum	2.416** (1.179)	0.157 (0.189)	0.185 (0.877)	-0.659 (0.671)	0.0376 (0.166)
Global financial crisis	0.989 (0.834)	0.609** (0.260)	0.0600 (0.364)	0.869** (0.354)	-0.170* (0.0929)
Linear time trend (qtr)	7.288*** (2.652)	3.871*** (0.597)	12.89*** (2.780)	3.174*** (0.933)	0.633*** (0.240)
Log assets	8.370*** (1.026)	2.243*** (0.285)	3.488*** (0.397)	3.581*** (0.492)	1.387*** (0.138)
Controls (applies to all dependent variables)					
Constant	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes
# of observations	503,718	2,254,951	1,154,225	773,898	2,691,475

of the estimated coefficients by comparing their levels with the mean of issuance propensity during non-stress periods: issuance likelihood in the U.S. was 0.99 percentage points higher during the COVID period, which is about 1.1 times higher (an increase of 113%) relative to the non-stress mean issuance propensity of 0.88%. Calculated similarly, issuance likelihood increased by 48%, 18%, and 17% in the euro area, China, and other EMs, respectively. In contrast to the increased issuance likelihood during COVID, issuance propensity decreased in all regions but China during the global financial crisis. During the taper tantrum, issuance propensity declined significantly by 33% and 25% in China and other EMs, respectively. As expected, the coefficients on the linear time trend are significant and positive in all regions, consistent with the global development of the corporate bond market. Furthermore, bond issuance propensity increases with firm size, as expected.

The second panel of Table 2 show similar results for the dollar amount of bonds issued (converted to USD using constant 2011 U.S. dollars).⁶ The dependent variable includes firm-months with no bond issuance, which is why the sample means are lower than expected (for example, the average firm-month includes issuance \$8.8 million in the U.S. during non-stress periods). During the COVID pandemic period, firms in almost regions issued significantly more. U.S. firms' bond issuance increased the most (the coefficient implies an increase of 272% calculated as \$23.81 million divided by \$8.76 million) but most regions increased: euro area firms' issuance increased 130%, other advanced economy firms increased 68%, and Chinese firms' issuance increased 36%.

Overall, Table 2 results show that during the COVID pandemic, firms globally saw a higher propensity to issue corporate bonds. This result is particularly notable for emerging market firms because it marks the first time that EMEs exhibited a positive propensity to issue bonds during a global stress event, mirroring the behavior typically observed in advanced economies.

⁶In untabulated results, we repeat the analysis with number of bonds issued; the results are qualitatively similar to dollar amounts issued.

Table 3: Corporate bond issuance during periods of financial stress - Currency denomination

This table shows panel regression results of bond issuance outcomes for the period from 2005 to 2021 for a global sample of public firms in Refinitiv Worldscope. The dependent variables are *Issuer dummy USD* (a dummy that takes on a value of 1 if a firm issues at least one USD-denominated bond in a month and 0 otherwise), and *Issuer dummy local* (a dummy that takes on a value of 1 if a firm issues at least one bond denominated in their home currency in a month, and 0 otherwise). The independent variables of interest are the stress period dummies, defined in Section 2.1. The regressions include a linear quarterly time trend and country-by-industry fixed effects, and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Euro area	Other AEs	U.S.	China	Other EMEs
<i>Dependent variable</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>
Mean	0.17%	0.10%	0.81%	0.15%	0.08%
COVID pandemic	0.000868* (0.000519)	0.000153 (0.000160)	0.0101*** (0.000953)	-0.000467* (0.000276)	-5.41e-05 (0.000113)
Taper tantrum	0.000529* (0.000314)	0.000251** (0.000106)	0.000710** (0.000325)	-0.000249 (0.000172)	-6.64e-05 (6.44e-05)
Global financial crisis	-0.000565*** (0.000174)	-0.000210*** (7.02e-05)	-0.000439** (0.000220)	-3.07e-06 (7.72e-05)	-0.000320*** (5.14e-05)
Linear time trend (qtr)	-0.000586 (0.000454)	0.000704*** (0.000175)	0.00500*** (0.000798)	0.00372*** (0.000563)	-5.24e-05 (0.000151)
Log assets	0.00115*** (0.000148)	0.000880*** (0.000118)	0.00234*** (0.000122)	0.00133*** (0.000154)	0.000677*** (5.97e-05)
<i>Dependent variable</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy local currency</i>
Mean	0.75%	0.30%	0.83%	0.80%	0.43%
COVID pandemic	0.00452*** (0.00122)	-0.000175 (0.000271)	0.00998*** (0.000958)	0.00200*** (0.000683)	0.00101*** (0.000306)
Taper tantrum	0.00205*** (0.000585)	0.000413** (0.000161)	0.000730** (0.000328)	-0.00305*** (0.000415)	-0.00123*** (0.000160)
Global financial crisis	-0.000624 (0.000514)	-0.000193 (0.000127)	-0.000464** (0.000227)	0.000336 (0.000321)	0.000222 (0.000150)
Linear time trend (qtr)	0.00307** (0.00141)	0.00293*** (0.000350)	0.00494*** (0.000842)	0.0120*** (0.00130)	0.00194*** (0.000502)
Log assets	0.00568*** (0.000581)	0.00198*** (0.000162)	0.00241*** (0.000135)	0.00570*** (0.000445)	0.00349*** (0.000252)
Controls (applies to all dependent variables)					
Constant	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes
# of observations	503,718	2,254,951	1,154,225	773,898	2,691,475

3.1.2 Currency denomination

Next, we examine whether the surge in issuance is driven by bonds denominated in a firm’s local currency or in USD. In Table 3, we replace issuance propensity from the first panel of Table 2 with a propensity to issue in either USD or local currency. The dependent variable in the top panel, USD issuer dummy, takes the value of 1 if the firm issues at least one bond denominated in USD in a month and 0 otherwise. Similarly, in the bottom panel, the local currency issuer dummy takes on a value of 1 if the firm issues at least one bond in their nation’s home currency. Comparing the USD bond issuance propensity with that for overall bond issuance, we observe that the coefficient on the GFC dummy is negative and significant in most regions, while the coefficient on the COVID dummy is only positive and statistically significant in the U.S and the euro area. Overall, unlike during the GFC, firms maintained dollar-bond access.

The pattern for local currency issuance propensity, however, mirrors the results for overall bond issuance shown in the first panel of Table 2 more closely: firms in most regions were significantly more likely to issue bonds during COVID in their home currency.⁷ In terms of economic magnitudes, the propensity to issue local currency bonds during COVID increased 120% in the U.S., 60% in the euro area, 25% in China and 23% in other EMEs, relative to the mean during non-stress periods.⁸ Notably, this stands in direct contrast to the taper tantrum, when local currency issuance propensity fell significantly for emerging market firms, confirming a pattern specific to the pandemic rather than a general feature of EM bond markets.

Taken together, the results above show that the higher propensity to issue bonds during

⁷The small difference between the top panel (USD) and bottom panel (local currency) for U.S. firms in column 3 is driven by issuance of non-U.S. subsidiaries of U.S. companies. While we roll issuance up at the parent firm level, the classification of local currency is done at the subsidiary level.

⁸The 60% for euro area, for example, is calculated as a 0.45 percentage point increase relative to the mean non-stress period issuance propensity of 0.75%.

our COVID period relative to other stress and non-stress periods, seen in Table 2, is driven by local currency bond issuance rather than U.S. dollar issuance. Furthermore, as observed with the overall results, this marks the first time that emerging market firms exhibited a positive propensity to issue corporate bonds denominated in local currency during a global stress event, mirroring the behavior of firms in advanced economies like the Euro area or the U.S. This market resilience stands in stark contrast to previous stress episodes, where local currency markets in EMEs typically shut down.

3.1.3 Emerging market economies

In this section we zoom in on firms located in non-China EMEs. In the first panel of Table 5, we investigate issuance propensity by firms in three sub-regions: Latin America, emerging Asia, and other non-China EMs.⁹ The results are stark: the surge in issuance propensity during the COVID stress period is driven entirely by issuance of local currency bonds by emerging Asian firms, which experienced a 31% increase in propensity relative to normal periods (0.14 percentage points higher compared to a non-stress sample mean of 0.46%). In Latin America, issuance of both local currency and USD bonds during COVID was significantly lower than in normal times, while in other non-China EMs issuance during COVID was insignificantly different than in normal times. During the GFC, USD issuance propensities in all sub-regions were diminished, and during the taper tantrum, issuance propensities by emerging Asian firms were significantly reduced. Combined with the results from the China columns in the previous tables, these results suggest that Asian EMs experienced a resilience in local currency bond markets that had not been seen in previous episodes of financial stress.

Taken together, these results provide evidence that nonfinancial corporate bond issuance

⁹Countries by sub-region: (1) Latin America: Argentina, Brazil, Chile, Colombia, Mexico and Peru; (2) emerging Asia: Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand and Vietnam; and (3) other non-China EMs: Israel, Russia, Turkey and South Africa.

Table 4: Financial market depth measures at year-end 2019 by sub-region

Latin America	Emerging Asia	Other non-China EM
Argentina 0.078	Hong Kong 0.816	Israel 0.324
Brazil 0.529	India 0.521	Russia 0.291
Chile 0.422	Indonesia 0.240	South Africa 0.725
Colombia 0.234	Malaysia 0.800	Turkey 0.360
Mexico 0.285	Philippines 0.509	
Peru 0.202	Singapore 0.780	
	South Korea 0.771	
	Thailand 0.727	
	Vietnam 0.202	
Average 0.292	Average 0.596	Average 0.425

patterns at the onset of the COVID pandemic were different from the global financial crisis and the taper tantrum: despite market turmoil, bond markets did not experience the sustained decline in issuance observed in other episodes of severe stress. In addition, the surge in issuance was driven not by USD issuance, but rather by issuance in firms’ home currency. This finding aligns with work by Avdjiev et al. (2024), who argue that the development of local currency credit has allowed emerging market firms to better absorb global shocks, reducing their reliance on foreign currency funding during periods of stress.

Local currency bond markets in different EM regions behaved very differently during COVID, despite the fact that it was a global shock. We hypothesize that one reason for the difference in bond market reaction is that these sub-regions have developed unequally and entered the COVID stress period with disparate financial market depth. Using data from the IMF’s Financial Development Index Database, we look at each emerging market economy’s level of “financial market depth” as of year-end 2019, a measure that captures the size and liquidity of a country’s financial markets, spanning both equity and debt securities (see Table 4).¹⁰ Consistent with our findings in the first panel of Table 5, emerging Asian countries had the highest average level of financial market depth entering the COVID pandemic, while Latin American countries had the lowest.

¹⁰The data can be found here: <https://data.imf.org/en/datasets/IMF.MCM:FDI>. There is no data for Taiwan.

To formally test the impact of pre-COVID financial depth, in the second panel of Table 5, we pool all non-China EM firms into one regression and include an interaction term that is the product of the COVID dummy and the 2019 country-level financial market depth level. While the coefficient on the COVID dummy alone becomes negative, we see that the interaction term is significant and positive; for the local currency issuance propensity in column (1), firms from a country with a financial market depth of at least 0.485 are significantly more likely to issue during COVID than in normal times, while firms from countries below this threshold are less likely.¹¹ As can be seen in Table 4, while seven out of nine Asian EMs (all but Indonesia and Vietnam) are above this financial market depth level, only one Latin American country (Brazil) and one other EM country (South Africa) are above this threshold. The coefficients move in the same direction for USD issuance propensity in column (2), the hurdle threshold is slightly higher at 0.609, which five of nine Asian EMs clear. Because corporate bond issuance was particularly strong in South Korea during the COVID pandemic, we re-run the same specification excluding Korean firm-months. We find that the results, shown in columns (3) and (4), are qualitatively the same.

In this section, we provide a detailed view of how local currency bond markets behaved across different emerging market regions during financial stress periods. Our analysis reveals that the local currency issuance was not uniform, but largely driven by firms in Asian emerging markets, offering new insights into a consequence of the unequal development of global bond markets.

We return to financial market depth in Section 4, where Figure 2 documents a positive cross-country relationship between the COVID rise in local currency issuance and pre-pandemic depth. To verify that depth does not just proxy firm quality, in Appendix Appendix D we compare country- versus firm-level characteristics; country factors, especially local corporate bond market size and capital-account openness, explain substantially more variation, though

¹¹To see this, we add up the coefficient on the COVID dummy and the product of the coefficient on the interaction term and our threshold financial market depth level: $-0.00514 + 0.0106 * 0.485 \approx 0$.

Table 5: Corporate bond issuance during periods of financial stress - Non-China EMEs

This table shows panel regression results of bond issuance outcomes for the period from 2005 to 2021 for non-China EM public firms in Refinitiv Worldscope. The dependent variables are *Issuer dummy USD* (a dummy that takes on a value of 1 if a firm issues at least one USD-denominated bond in a month and 0 otherwise), and *Issuer dummy local* (a dummy that takes on a value of 1 if a firm issues at least one bond denominated in their home currency in a month, and 0 otherwise). The independent variables of interest are the stress period dummies, defined in Section 2.1. In the second panel, we include the interaction between the COVID dummy and the country-level financial market depth variable as measured at year end 2019. The regressions include a linear quarterly time trend and country-by-industry fixed effects, and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Latin America	Latin America	Emerging Asia	Emerging Asia	Other non-China EME	Other non-China EME
<i>Dependent variable</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy USD</i>
Mean	0.70%	0.35%	0.46%	0.06%	0.14%	0.05%
COVID pandemic	-0.00473*** (0.00129)	-0.00175* (0.000930)	0.00141*** (0.000348)	7.14e-05 (0.000115)	0.000518 (0.000535)	-0.000182 (0.000243)
Taper tantrum	0.00135 (0.000934)	0.000242 (0.000626)	-0.00152*** (0.000182)	-0.000106* (5.70e-05)	-0.000671*** (0.000222)	1.11e-05 (0.000155)
Global financial crisis	0.000124 (0.000679)	-0.00166*** (0.000406)	0.000340* (0.000181)	-0.000196*** (4.89e-05)	-0.000435*** (0.000169)	-0.000324*** (0.000104)
Linear time trend (qtr)	0.000155 (0.00173)	-0.00132 (0.00120)	0.00260*** (0.000580)	8.91e-05 (0.000141)	0.000590 (0.000671)	-0.000999* (0.000517)
Log assets	0.00244*** (0.000266)	0.00181*** (0.000269)	0.00415*** (0.000325)	0.000610*** (7.09e-05)	0.00104*** (0.000238)	0.000495*** (0.000108)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	179,915	179,915	2,159,023	2,159,023	352,537	352,537
R-squared	0.023	0.025	0.031	0.006	0.024	0.005

Sample:	All non-China EMs	All non-China EMs	All non-China EMs, ex. S. Korea	All non-China EMs, ex. S. Korea
<i>Dependent variable</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy local currency</i>	<i>Issuer dummy USD</i>
Mean	0.43%	0.08%	0.31%	0.08%
COVID pandemic * Financial Depth (2019)	0.0106*** (0.00149)	0.00150** (0.000618)	0.00222* (0.00123)	0.00189** (0.000753)
COVID pandemic	-0.00514*** (0.000730)	-0.000913*** (0.000352)	-0.00150** (0.000647)	-0.00109*** (0.000383)
Taper tantrum	-0.00132*** (0.000183)	-8.40e-05 (7.41e-05)	-0.000373** (0.000169)	-7.59e-05 (8.22e-05)
Global financial crisis	0.000233 (0.000171)	-0.000359*** (5.89e-05)	-0.000291* (0.000161)	-0.000401*** (6.17e-05)
Linear time trend (qtr)	0.00174*** (0.000580)	-0.000107 (0.000177)	0.000447 (0.000520)	0.000223 (0.000202)
Log assets	0.00365*** (0.000275)	0.000736*** (6.56e-05)	0.00239*** (0.000212)	0.000656*** (5.31e-05)
Controls				
Constant	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes
# of observations	2,327,240	2,327,240	1,954,881	1,954,881
R-squared	0.030	0.012	0.022	0.013

firm characteristics also matter. This complements the firm-level question we turn to next: which firms issued.

3.2 Firm Characteristics and Cost of Issuance

Having documented the unprecedented surge in aggregate corporate bond issuance during the COVID-19 pandemic, driven by issuances in local currency, we next examine *which* types of firms were able to access the local currency market and at *what* cost. For this analysis, we refine our focus to three key groups: Advanced Economies (pooled), China, and other Asian Emerging Markets. We concentrate on these regions because they experienced a global issuance boom, whereas Latin America and other EME regions did not exhibit a comparable surge in activity.

3.2.1 Firm characteristics: Who issues?

Our prior results suggest that Asian EMs have “graduated”, behaving more like advanced economies by maintaining market access during stress. In this section, we find that, while advanced economy issuance was largely disciplined by a “flight to quality,” favoring only the largest and safest firms, Asian local currency markets remained open even to “less safe” issuers, allowing them to take advantage of abundant global liquidity.

In the first panel of Table 6, we compare firms in the top quartile of size (large) to firms in the middle two quartiles (medium). In advanced economies, the “flight to quality” typical of crisis periods was evident, as only large firms exhibited a higher propensity to issue bonds during the COVID pandemic. Similarly, in China and other Asian emerging markets, the largest firms also saw a higher likelihood of issuing local currency bonds during COVID, a resilience that stands in sharp contrast to the market closures observed during

the Taper Tantrum and the Global Financial Crisis. However, a notable divergence occurred in non-China Asian EMs, where investors did not discriminate based on firm size. In this region, even medium-sized firms experienced a significantly higher issuance propensity during COVID. The economic magnitudes of this shift are striking: while local currency issuance propensity increased by 56% for large firms, it surged by 91% for medium-sized firms, underscoring the unique depth and resilience of these local markets.¹²

In the second panel of Table 6, we examine issuance propensity for firms in the middle two quartiles of short-term debt ratios (medium) to firms in the top quartile (high).¹³ Only in China and other Asian EMs do we see that firms with the most short-term debt were more likely to issue corporate bonds during COVID. These results are in contrast to previous episodes, for instance in China during the Global Financial Crisis and in other Asian EMs during the Taper Tantrum, when firms with high levels of short-term debt were less likely to issue bonds, signaling investor discrimination by firm riskiness.

Across both panels of Table 6, we observe a common pattern. While this broad-based access signals a maturing market capable of supporting firms during stress, it also raises potential stability concerns. Specifically, our results in the first panel reveal that in emerging markets outside of China, even medium-sized firms were able to issue local currency bonds during the pandemic, which is a sharp departure from the Taper Tantrum and Global Financial Crisis, when market access was severely constrained even for larger firms. This pattern is further corroborated by the second panel, where firms with high levels of short-term debt

¹²As previously discussed, issuance by firms in South Korea were particularly resilient during COVID. When we exclude firm-months for South Korea, issuance propensity of medium-sized firms in other EMs still shows resilience: it did not decline during COVID as in the previous financial stress episodes. As an alternative, in untabulated results, we also show that after pooling all emerging market firms and including the interaction term between the COVID dummy and 2019 financial market depth, as in the second panel of Table 5, medium-sized firms from emerging market countries with a financial market depth of at least 0.565 exhibit higher issuance propensity during COVID than during non-stress periods. In AEs, both the interaction term and COVID dummy for medium-sized firms remain negative, indicating that there is no similar threshold for financial market depth that would result in higher issuance propensity.

¹³Note that a large portion of Chinese firm-months have short-term debt ratios of 1, the highest possible ratio, leading to the number of observations in the “high” quartile being larger than the number in the two “medium” buckets.

Table 6: Local currency bond issuance by firm characteristics

This table shows panel regression results of bond issuance outcomes for the period from 2005 to 2021 for public firms in Refinitiv Worldscope. In the first panel, we show results for firms in the top quartile of their country-year's total assets (large) and for firms in the middle two quartiles (medium). In the second panel, we show results for firms in the middle two quartiles of their country-year's short-term debt to total debt (medium) and for firms in the top quartile (high). The dependent variable is *Issuer dummy local* (a dummy that takes on a value of 1 if a firm issues at least one bond denominated in its nation's local currency in a month and 0 otherwise). The independent variables of interest are the stress period dummies, defined in Section 2.1. The regressions include a linear quarterly time trend and country-by-industry fixed effects and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Advanced Economies		China		Non-China Asian EMs	
Firm size	Large	Medium	Large	Medium	Large	Medium
<i>Dependent variable</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>
	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>
Mean	1.86%	0.06%	2.61%	0.17%	1.54%	0.08%
COVID pandemic	0.0163*** (0.00133)	-0.000242** (0.000118)	0.0158*** (0.00270)	-4.64e-06 (0.000421)	0.00863*** (0.00129)	0.000689** (0.000278)
Taper tantrum	0.00337*** (0.000583)	0.000155* (8.81e-05)	-0.00981*** (0.00141)	0.000372 (0.000326)	-0.00359*** (0.000674)	-0.000455*** (7.30e-05)
Global financial crisis	-0.00103** (0.000475)	-0.000340*** (3.90e-05)	-0.00378*** (0.00115)	-0.000769*** (0.000155)	0.000131 (0.000707)	-4.74e-05 (6.13e-05)
Linear time trend (qtr)	0.0126*** (0.00122)	0.000624*** (0.000104)	0.0526*** (0.00478)	0.00210*** (0.000528)	0.00664*** (0.00173)	0.00195*** (0.000213)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	1,027,315	2,045,863	205,208	410,017	579,535	1,155,192
R-squared	0.040	0.004	0.023	0.002	0.031	0.004

Sample:	Advanced Economies		China		Non-China Asian EMs	
ST debt (% of debt)	Medium	High	Medium	High	Medium	High
<i>Dependent variable</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>	<i>Issuer dummy local</i>
	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>	<i>currency</i>
Mean	0.82%	0.07%	0.70%	0.11%	0.18%	0.01%
COVID pandemic	0.00807*** (0.000734)	-0.000108 (0.000301)	0.00225* (0.00115)	0.00125* (0.000703)	0.00238*** (0.000574)	0.00157*** (0.000599)
Taper tantrum	0.00123*** (0.000330)	0.000229 (0.000156)	-0.000212 (0.000867)	0.000173 (0.000316)	-0.00199*** (0.000296)	-0.000589*** (9.80e-05)
Global financial crisis	-0.000352 (0.000275)	-0.000207 (0.000176)	-0.00244*** (0.000654)	-0.000588*** (0.000168)	0.000541 (0.000340)	-0.000121 (0.000183)
Linear time trend (qtr)	0.00648*** (0.000655)	0.000477** (0.000236)	0.00785*** (0.00118)	0.00152*** (0.000497)	0.00460*** (0.000719)	0.00114*** (0.000373)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	1,549,439	802,804	265,317	280,462	998,502	518,654
R-squared	0.031	0.047	0.006	0.002	0.014	0.004

(and thus higher refinancing risk) also ramped up issuance, taking advantage of favorable liquidity conditions to roll over their liabilities.

Unlike in advanced economies, where issuance was disciplined by a clear “flight to quality” (favoring large, low-rollover-risk firms), the Asian EM local currency market appeared significantly less discriminating. The fact that medium-sized firms and those with precarious short-term refinancing needs could issue aggressively suggests that the surge in local currency bonding was driven as much by abundant global liquidity seeking yield as by structural improvements in domestic market depth. This “indiscriminate” issuance, while acting as a vital lifeline in the short term, serves as a potential red flag: it may have allowed riskier borrowers to leverage up precisely when their fundamentals were most fragile, creating pockets of vulnerability that were absent in previous crisis episodes.

In untabulated results, we find that Latin American firms do not exhibit the same indiscriminate issuance pattern observed in Asia; rather, they show no notable difference in behavior during COVID compared to other stress periods, reinforcing our finding that the “graduation” to broad-based market access is distinctively an Asian emerging market story.

For completeness, we also examine issuance patterns in the dollar-denominated corporate bond market (Appendix C). During the GFC, even large firms were less likely to issue USD bonds. In contrast, during COVID, the largest firms in advanced economies were more likely to issue USD bonds, while firms in China and other Asian EMs maintained issuance of dollar-denominated bonds.

3.2.2 The cost of issuance

We next examine the cost of debt issued during financial crises compared to non-stress periods. For months in which a firm issues at least one bond, we calculate the size-weighted average spread (defined as issuance yield minus the yield on the maturity-equivalent risk-

free bond) on all bonds issued by that firm within that month. We use that spread as the dependent variable in a regression similar to Equation 1. Notably, data on spreads is not available for all firm-months with issuance, and coverage is substantially lower for emerging market economies; for this reason, we include only country fixed effects rather than country-by-industry fixed effects.

Table 7: Cost of issuance during periods of financial stress

This table shows regression results of weighted average spreads for months in which a firm issues at least one corporate bond. The dependent variable is *Weighted average spread*, calculated as the average bond spread issued in a firm-month weighted by the size of each bond. The independent variables of interest are the stress period dummies, defined in Section 2.1. Odd columns include issuance in any currency, while even columns include only local currency issuance. The regressions include a linear quarterly time trend and country fixed effects and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Advanced Economies		China		Non-China Asian EMs	
Issuance	All	Local currency	All	Local currency	All	Local currency
<i>Dependent variable</i>	<i>Weighted average spread</i>	<i>Weighted average spread</i>	<i>Weighted average spread</i>	<i>Weighted average spread</i>	<i>Weighted average spread</i>	<i>Weighted average spread</i>
Mean	187	183	218	136	211	182
COVID pandemic	75.05*** (11.59)	78.58*** (12.10)	81.46** (35.59)	31.29 (46.89)	85.74*** (24.71)	109.2** (42.17)
Taper tantrum	3.608 (4.285)	2.430 (4.540)	-17.31 (57.13)	30.91 (56.40)	6.749 (11.28)	28.24* (16.17)
Global financial crisis	114.4*** (7.632)	113.3*** (7.729)			105.4** (42.08)	121.8* (70.20)
Linear time trend (qtr)	0.247 (0.159)	0.162 (0.163)	-4.652** (2.240)	2.197 (3.050)	-1.004** (0.416)	0.135 (0.685)
Log assets	-52.87*** (5.513)	-52.38*** (5.572)	-24.89* (13.45)	-11.92 (28.72)	-36.01*** (3.341)	-41.38*** (4.027)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	No	No	Yes	Yes
# of observations	17,576	15,311	333	81	852	394
R-squared	0.375	0.387	0.187	0.032	0.212	0.336

As shown in Table 7, the average spread for bonds issued during COVID is significantly higher in all specifications, except for local currency issuance in China. Similarly, spreads of all bonds issued during the GFC were significantly higher in both AEs and non-China Asian EMs. Testing the equality of coefficients in these regions confirms that for firms in advanced economies, the spread increase in COVID was not as large as the increase seen during the GFC, while for firms in Asian EMs, the increase in spreads paid on bonds issued

during COVID is statistically indistinguishable from the increase during the GFC. In other words, not only did firms from a wider quality spectrum in emerging Asia tap corporate bond markets during the onset of COVID, they experienced a spread increase that was comparable to that seen by issuers during the Global Financial Crisis.

Given that issuance behavior and cost of issuance differed significantly between advanced economies and EM Asia, it is likely that corporate vulnerabilities also evolved differently in the two regions. On one hand, high levels of short-term debt often serve as a proxy for refinancing risk, compelling firms to tap bond markets to roll over maturing liabilities. In this scenario, abundant global liquidity allows financially fragile firms to avert immediate default, though potentially at the cost of worsening medium-term solvency. On the other hand, firms with low short-term debt and no pressing rollover needs may issue bonds for opportunistic motives (market timing). In this case, firms build precautionary cash buffers but not necessarily for investment related purposes.

The next section explores the consequences of these divergent issuance patterns.

3.3 Post-issuance outcomes

In this section, we examine whether the financial ratios for companies that issued local currency bonds in 2020 evolved differently from firms that did not issue bonds. We focus on three ratios:

- Net debt, calculated as total debt minus cash, divided by total assets;
- Altman's Z-score, calculated based on the following formula: $1.2 * \text{working capital to total assets} + 1.4 * \text{retained earnings to total assets} + 3.3 * \text{earnings before interest and taxes to total assets} + 0.6 * \text{market value of equity to total liabilities} + 0.999 * \text{net sales to total assets}$.

- Ohlson’s O-score, calculated based on the following formula: $-1.32 - 0.407 * \log \text{ assets} + 6.03 * \text{total liabilities to total assets} - 1.43 * \text{working capital to total assets} + 0.076 * \text{current liabilities to current assets} - 1.72 * (\text{a dummy that takes on a value of 1 if total liabilities are greater than total assets}) - 2.37 * \text{net income to total assets}$.

Higher net debt and Ohlson’s O-scores, as well as lower Altman’s Z-scores, are associated with higher financial vulnerability.

For each firm, we calculate the ratios/scores on an annual basis, and then calculate the change in ratio at the end of year t relative to the ratio at the end of year $t - 1$ (the change variable is winsorized at the 5% and 95% percentiles). For example, the change in 2020 represents the ratio at the end of 2020 minus the ratio at the end of 2019 and reflects the effect of any bond or other debt instrument issuance in 2020, as well as changes in the firm’s assets and other financial variables.

In Table 8, we calculate the relative difference in evolution of these ratios for firms that issued local currency bond(s) in 2020 compared to firms that did not issue such bonds, separated by regions and on a year-by-year basis from 2020 to 2023. The first panel shows that in 2020, net debt ratios for issuers compared to non-issuers increased significantly for firms in advanced economies, while for non-China Asian EMs, net debt ratios increased significantly in 2021 and 2023.

The next two panels look at measures of the risk of near-term default, proxied by Altman’s Z-score and Ohlson’s O-score (note that a *lower* Z-score and *higher* O-score is associated with higher risk of default). As measured by Z-score, issuers in advanced economies and Asian EMs became relatively riskier in 2020 compared to non-issuers, and in non-Chinese Asian EMs, this ratio continued to degrade significantly in later years. In addition, non-China Asian bond issuers saw their O-score ratios increase in 2020 and in later years, again indicating higher risk.

Table 8: Post-issuance outcomes

This table shows regression results of changes in firm-level ratios by year for public firms in Refinitiv Worldscope. The variable of interest is a dummy that takes on a value of 1 if the firm issued at least one local currency bond in 2020, and 0 otherwise. Each coefficient shows the relative change in the ratio of interest from year $t-1$ to year t , where year t is shown in the first column (e.g. 2020 means the change from 2019 to 2020). For each region, we show changes in net debt (debt minus cash, divided by total assets), Altman's Z-score, and Ohlson's O-score. All changes are winsorized at the 5th and 95th percentile. Each regression includes firm-level log assets as a control, and includes country-by-industry fixed effects. The sample includes only firms with non-missing financial data in 2019. Standard errors clustered at the 2-digit SIC level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Advanced Economies	China	Non-China EM Asia
<hr/>			
<i>Dependent variable:</i>	<i>Relative change in NET DEBT from previous year</i>		
2020	0.00844* (0.00469)	-0.00223 (0.00604)	0.00687 (0.00526)
2021	0.0127*** (0.00409)	-0.00796 (0.00811)	0.0157*** (0.00447)
2022	-0.00536 (0.00381)	-0.00176 (0.00800)	-0.00196 (0.00533)
2023	0.00272 (0.00319)	0.00680 (0.00461)	0.00802** (0.00394)
<hr/>			
<i>Dependent variable:</i>	<i>Relative change in Z-SCORE from previous year</i>		
2020	-0.198** (0.0901)	-0.776*** (0.145)	-0.175** (0.0736)
2021	0.205 (0.127)	0.160 (0.144)	-0.316** (0.132)
2022	0.133 (0.152)	0.0774 (0.128)	0.102 (0.100)
2023	-0.450*** (0.140)	0.256** (0.106)	-0.199** (0.0859)
<hr/>			
<i>Dependent variable:</i>	<i>Relative change in O-SCORE from previous year</i>		
2020	-0.00519 (0.0320)	-0.0513 (0.0424)	0.0713** (0.0281)
2021	-0.0373 (0.0346)	-0.0127 (0.0455)	0.126*** (0.0380)
2022	-0.0564* (0.0336)	0.0260 (0.0409)	0.00800 (0.0285)
2023	-0.0104 (0.0232)	0.0632 (0.0380)	0.0757** (0.0299)
Control for firm size	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes
Clustering	Industry	Industry	Industry
Sample	Firms with non-missing ratio in 2019		

Taken together, post-issuance outcomes for AE issuers provide compelling evidence of a “flight to quality” dynamic rather than purely opportunistic cash hoarding. Net debt among these issuers increased significantly in 2020 (+0.84%) and continued to rise in 2021 (+1.27%), a trend that argues against the “pure opportunism” hypothesis. If firms were issuing solely to build precautionary cash buffers, Net debt (defined as debt minus cash) would likely remain stable or decrease as cash assets offset debt liabilities. Instead, the continued rise in Net Debt indicates that AE firms actively deployed the proceeds, likely to cover operating losses or fund investments.

Furthermore, Altman’s Z-Score, a proxy for default risk, initially deteriorated in 2020 (-0.198), reflecting the immediate impact of the pandemic shock. While Z-scores for AE issuers also show a significant decline in 2023, this did not translate into an increased probability of default. In fact, the probability of default, as measured by Ohlson’s O-score, did not exhibit a statistically significant increase in any year from 2020 to 2023. Collectively, these indicators suggest that while AE issuers experienced a temporary spike in financial vulnerability, their underlying solvency remained intact, validating the view that markets disciplined capital allocation toward quality firms resilient enough to absorb leverage shocks.

In contrast, the corporate bond issuance boom appears to have had the largest impact on firms in non-China EMs, with all measures showing a relative weakening of firm fundamentals in almost all years from 2020 to 2023. While these firms did not exhibit a statistically significant increase in net debt immediately in 2020, a significant rise in leverage materialized by 2021. More critically, indicators of default risk showed immediate and sustained deterioration. Altman’s Z-Scores declined significantly in 2020, 2021 and 2023. Concurrently, the probability of default, measured by Ohlson’s O-Score, rose sharply in 2020 and worsened further in 2021 and 2023. This is consistent with our findings in the previous section that even riskier firms in non-China Asian EMs (those with smaller size and higher refinancing needs) were able to take advantage and issue corporate bonds during the COVID pandemic.

While access to local markets cushioned firms against the immediate liquidity shock, it effectively converted short-term refinancing risk into elevated medium-term solvency risk. Consequently, the “spare tire” function of local bond markets, while successfully keeping firms afloat during the crisis, may have inadvertently sowed the seeds for future instability by enabling a persistent deterioration in corporate credit quality.

4 Foundations of Market Access for Emerging Economy Corporate Bonds

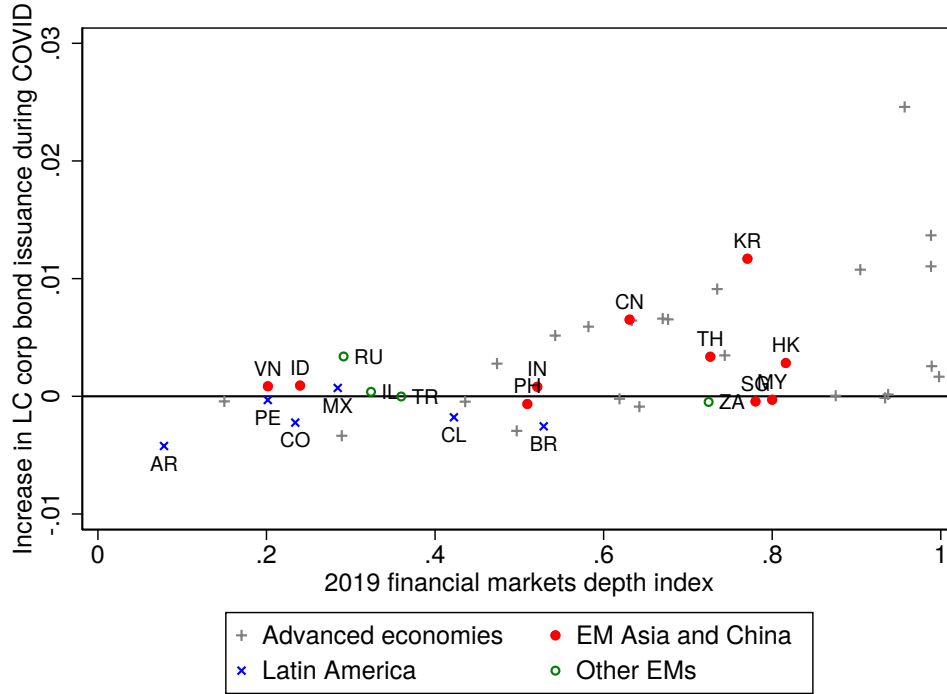
We have shown so far that corporate bond markets were more resilient during COVID than in previous crises. While this has been discussed in the context of the U.S. (Becker and Benmelech, forthcoming), the fact that it is true for Asian emerging markets is new to the literature. The deepening of domestic capital pools may have allowed local investors to step in and fund the capital-raising needs of local firms. In this section, we investigate this hypothesis and explore other potential drivers of our findings by focusing on the cross-sectional variation across different emerging markets.

4.1 Financial market depth

To understand what drove the surge in local currency issuance, we revisit pre-pandemic financial market depth, which we discussed in Section 3.1.3. For each country, we calculate the increase in local currency issuance propensity during COVID as the average local currency issuance propensity during these months minus the average local currency issuance propensity during all non-COVID months. We then plot this difference for each country

Figure 2: Issuance during COVID is positively related to pre-COVID financial market depth

Scatter plot of the cross-country increase in local currency issuance propensity during COVID (calculated as the average local currency issuance propensity during these months minus the average local currency issuance propensity during all non-COVID months) compared to the 2019 level of financial market depth. Source: IMF, Refinitiv Worldscope.



against that country's level of financial market depth as of year-end 2019¹⁴ The results are shown in Figure 2.

The first pattern that emerges is a positive relationship between relative local currency bond issuance propensity during COVID and the external measure of financial market depth. The cross-sectional correlation across the all countries is 0.52. Secondly, as previously discussed, we see that many of the emerging Asian countries, represented by the red dots, show up further to the right (i.e., deeper financial markets), especially compared to Latin American countries (blue "x"s) or other EMs (green circles). By this measure, many emerging Asian countries appear similar to advanced economies (gray pluses).

¹⁴This analysis is similar in spirit to that of Avdjiev et al. (2024), though we have different variables. In particular, they measure the change in the *share* of local currency debt in total debt and compare it to the *change* in the foreign development index.

4.2 Investor base

We next examine the role of the investor base. Because the surge in issuance was concentrated in local currency bonds, which are predominantly held by domestic investors (Maggiori et al., 2020), we hypothesize that the depth of local capital pools serves as a key determinant of market access during the crisis. In Figure 3, we plot two measures of investor base against the relative increase in local currency bond issuance during COVID: the pre-COVID foreign investors' holdings of debt as a percentage of GDP as per International Monetary Fund (2018), and the pre-COVID size of the domestic currency corporate bond markets.

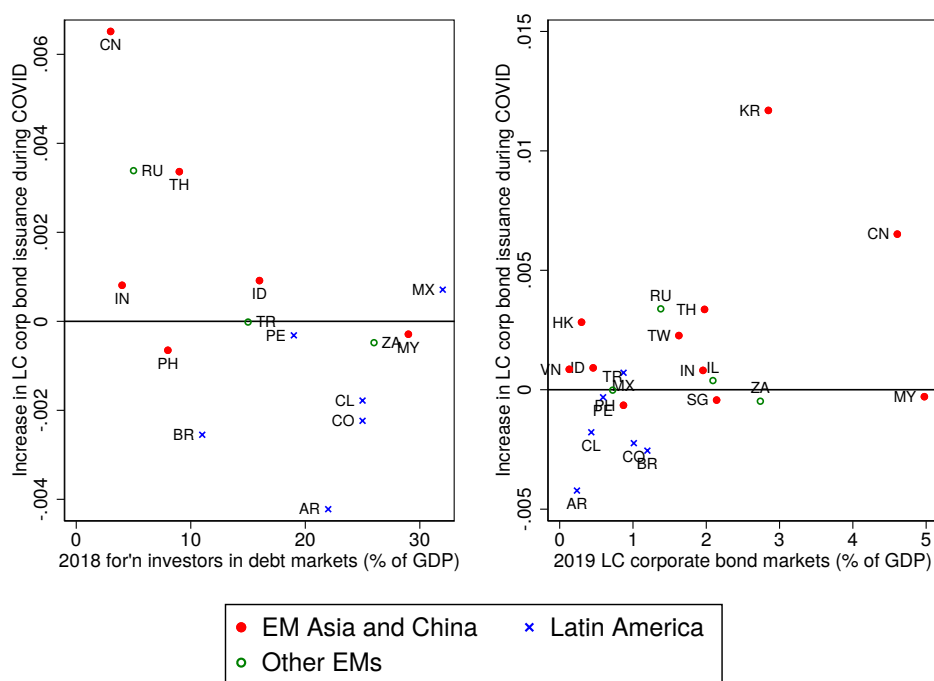
We use foreign investors' holdings as a share of GDP (left panel), which we employ as a proxy for foreign investor presence, distinct from market depth. We hypothesize that a larger foreign presence should be negatively related to the size of the domestic investor base. Second, it has been shown that foreign capital flows are flighty, with foreigners retreating in times of crises. A heavier reliance on foreign capital in bond markets should therefore make local currency issuance during COVID more difficult, and we see that the relationship is negative; the correlation for the 15 EMs with non-missing data is -0.55. The EM Asian countries had on average a lower reliance on foreign investors before COVID, whereas Latin American countries were heavily reliant on foreign investors.

The right panel shows a direct measure of the size of the domestic investor base, proxied by the size of the local currency corporate bond market as a percentage of GDP as of year-end 2019. A larger pre-COVID local currency bond market is positively related to the issuance propensity increase during COVID; the correlation is 0.42 for 21 EMs. Again, many of the EM Asian countries had larger domestic corporate bond markets, while Latin American corporate bond markets were much smaller.

So far, we have examined a series of country-level characteristic in order to explain COVID corporate bond market resilience in EMs. However, it is possible that some countries have

Figure 3: Issuance during COVID is positively related to pre-COVID domestic investor base

Scatter plot of the cross-country increase in local currency issuance propensity during COVID (calculated as the average local currency issuance propensity during these months minus the average local currency issuance propensity during all non-COVID months) compared to the 2018 debt held by foreign investors as a percentage of GDP (left panel) or to the 2019 size of the local currency corporate bond market as a percentage of GDP (right panel). Source: IMF, Bloomberg, Refinitiv Worldscope.



firms that were more appealing to investors, leading to a surge in investment capital (e.g. firms that are larger, more profitable, or less levered), and that country-level characteristics are less important. To explore this possibility, we run a horse race regression, comparing how well different variables explain the cross-section of COVID bond issuance patterns (similar to the analysis in Doidge et al. (2007)). The results are shown in Appendix D. While country-level characteristics play a dominant role in explaining cross-country variation, our analysis reveals that firm characteristics remain economically significant.

4.3 The role of policy support in sustaining corporate bond issuance

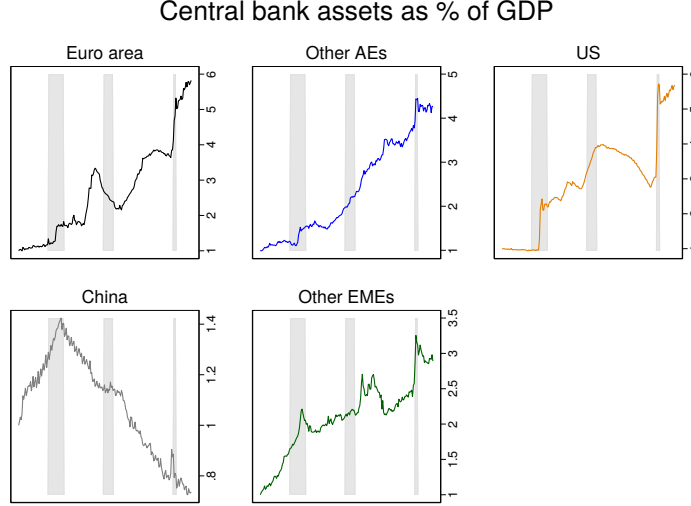
One distinguishing feature of the COVID-19 crisis was the unprecedented scale of policy stimulus. Following the onset of the pandemic, central banks and governments worldwide introduced a wave of support measures, many of which specifically targeted corporate bond markets and the broader corporate sector¹⁵

The increases in monetary policy support at the onset of COVID pandemic are partially captured by figure 4, showing the evolution of the size of central banks' balance sheets (as a portion of GDP) from 2005 through 2021. Although the amounts of central bank assets in all regions increased during GFC and COVID, the speed and size of the increases during COVID is striking, particularly in the U.S., euro area and other (non-China) EMs. Such expansion of balance sheets likely drove long-term yields down (figure 5), leading to normalization of bond market functioning and higher demand for riskier bonds. In contrast, during the taper tantrum, central bank balance sheets around the globe, and particularly in emerging

¹⁵Studies that focus on the effects of specific central banks' (BoE, ECB, Fed) pre- and post-COVID credit policies on corporate bond issuance in corresponding countries include D'Amico and Kaminska (2019), Todorov (2020), Boyarchenko et al. (2022) and Kitsul et al. (forthcoming). In the subsequent discussion, we take a broader approach and discuss a relationship between corporate bond issuance and central banks' overall balance sheet growth, and not just growth in their holdings of corporate assets, as well as consider a broader set of countries.

Figure 4: Central bank assets as percentage of GDP

Monthly time series from 2005 to 2021 showing the size of central bank assets divided by GDP, with the ratio normalized to 1 as of January 2005. Shaded areas represent the months of the GFC, taper tantrum and COVID as per Section 2.1. Lines for euro area, other AEs and other EMs are calculated as the sum of central bank assets divided by the sum of GDP for the member countries. Source: Haver Analytics.



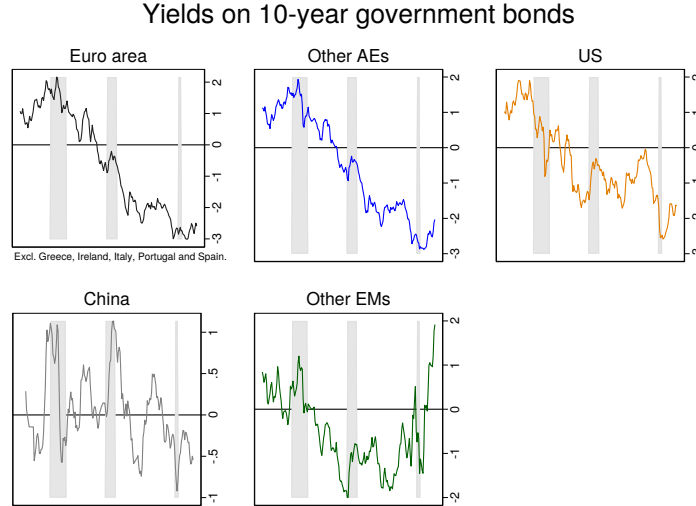
economies (bottom row), did not expand rapidly. Overall, figure 4 shows high-level evidence that monetary policy support likely helped bolster corporate bond markets globally.

By providing monetary support, central banks, particularly those from major economies, bolstered markets not only in their own countries but also abroad. Figure 6 plots country-level increases in propensity of local currency corporate bond issuance (as defined in the previous section) versus changes in size of central bank balance sheets (size of central bank assets) at the onset of COVID pandemic. We observe a positive relationship between changes in central bank assets for advanced, but not emerging markets, even though EMs' corporate bond markets also exhibited resilience during COVID, as we documented earlier. One potential explanation for such a result is that policy stimulus in major economies not only supported markets in those economies but also around the globe, with “a rising tide lifting all boats.”

Indeed, the unprecedented size and scale of policy support during COVID pandemic likely contributed to a quick improvement of investor sentiment toward bonds, as well as their willingness to supply capital more generally, around the world. In Figure 7, we examine

Figure 5: Yields on 10-year government bonds

Monthly time series from 2005 to 2021 showing the yields on 10-year government bonds. Shaded areas represent the months of the GFC, taper tantrum and COVID as per Section 2.1. Each time series is demeaned, and lines for euro area, other AEs and other EMs are calculated as the mean of the member countries. The euro area calculation excludes Greece, Ireland, Italy, Portugal and Spain. Source: Haver Analytics.



fund flows into country-specific bond mutual funds as a percentage of assets under management (AUM).¹⁶ In advanced economies (top row), bond flows experienced outflows for many months during the GFC; the outflows from other AEs during the GFC are especially striking. In contrast, during COVID, although all regions experienced one or two months of large outflows (the outflows in March 2020 in the U.S. were especially large), sentiment quickly turned, with market participants returning to investing in bonds - a pattern which held up for the post-COVID months of 2020 and 2021. The same pattern exists in emerging economies for the GFC and COVID; the taper tantrum also saw a number of consecutive months of modest outflows from bond funds. Overall, there is some evidence that investors' capital flows were different in COVID compared to previous financial stress episodes.

¹⁶Unfortunately, EPFR data does not differentiate between sovereign and corporate bond funds.

Figure 6: Issuance during COVID is positively related to 2020 central bank balance sheet expansion in AEs

Scatter plot of the cross-country increase in local currency issuance propensity during COVID (calculated as the average local currency issuance propensity during these months minus the average local currency issuance propensity during all non-COVID months) compared to the percent change in central bank balance sheets (December 2020 relative to December 2019). Note: graph does not show Canada, whose central bank assets grew 358%. Source: Haver, Refinitiv Worldscope.

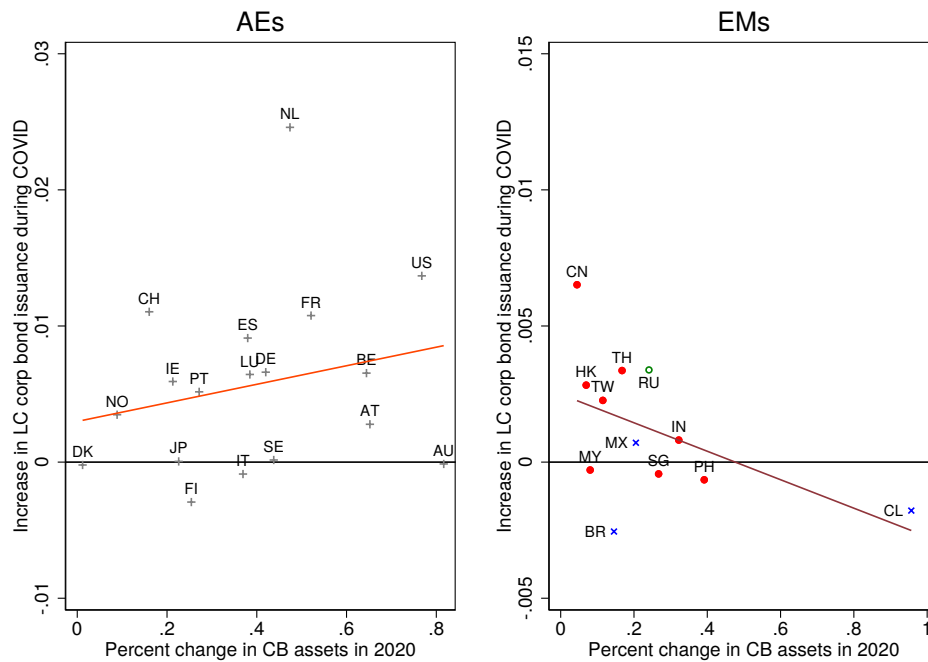
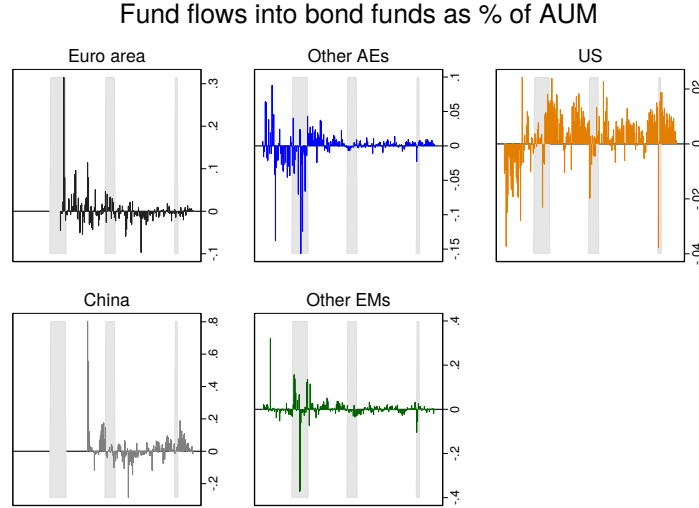


Figure 7: Fund flows into bond funds as percentage of assets under management

Monthly time series from 2005 to 2021 showing the flows into bond mutual funds, divided by the previous month's assets under management. Shaded areas represent the months of the GFC, taper tantrum and COVID as per Section 2.1. Bars for euro area, other AEs and other EMs are calculated as the sum of fund flows divided by the sum of the assets under management. Source: EPFR Global.



5 Concluding Remarks

This study examines corporate bond issuance dynamics across three major financial stress episodes, revealing a paradigm shift during the COVID-19 pandemic. We document an unprecedented expansion in corporate borrowing worldwide, most notably among firms in emerging Asia that successfully bypassed historical sudden stops. This convergence was driven primarily by a surge in issuances denominated in the local currency of the borrower country.

Yet this convergence in market access masked a stark divergence in the composition of issuers, with the types of firms tapping markets in emerging Asia looking very different from those in advanced economies. Unlike in advanced economies, where issuance was disciplined by a flight to quality favoring large, low-rollover-risk firms, the Asian EM local currency market (excluding China) appeared significantly less discriminating.

This indiscriminate issuance, while acting as a vital lifeline in the short term, serves as a

potential red flag: it may have allowed riskier borrowers to lever up precisely when their fundamentals were most fragile at spread increases that were comparable to the GFC, creating pockets of vulnerability that were absent in previous crisis episodes. Indeed, our analysis of post-issuance outcomes confirms this concern, showing that these same firms subsequently experienced a persistent deterioration in financial health, marked by higher leverage and elevated default risk measures in the years following the pandemic.

The synchronous and unprecedented expansion of central bank balance sheets during COVID-19 underpinned the global surge in corporate bond issuance, effectively backstopping market liquidity and ensuring continued access to credit. This coordinated policy response improved investor risk sentiment and amplified global liquidity, creating cross-border spillover effects that buoyed issuance worldwide. Crucially, our analysis reveals that such spillovers were contingent on domestic institutional development: only EMs with pre-existing market depth and robust local investor bases were able to leverage this liquidity surge. In fact, we find that the depth of financial markets and the size of the domestic investor base explain a significant portion of cross-country variation in issuance propensity over the COVID stress period.

Ultimately, the sustained issuance capacity of corporate bond markets during the COVID-19 crisis, particularly in emerging Asia, reflects a structural advancement in market development. These findings highlight that the maturation of local currency bond markets in emerging economies warrants close macroprudential oversight as global financial conditions continue to evolve.

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Appendix A Issuance by Country

Table A1: Number of issuers and non-issuers by country

Country	Number of listed firms			Country	Number of listed firms		
	Issuers	Non-issuers	Total		Issuers	Non-issuers	Total
Argentina	23	92	115	Luxembourg	19	71	90
Australia	90	2,696	2,786	Malaysia	61	1,261	1,322
Austria	16	81	97	Mexico	64	136	200
Belgium	26	140	166	Netherlands	45	215	260
Bermuda	19	86	105	New Zealand	25	186	211
Brazil	159	400	559	Norway	54	366	420
Canada	226	4,376	4,602	Peru	14	151	165
Chile	28	222	250	Philippines	30	206	236
China	975	5,432	6,407	Poland	22	684	706
Colombia	10	76	86	Portugal	11	56	67
Denmark	15	211	226	Russian Federation	58	1,041	1,099
Finland	36	177	213	Singapore	98	796	894
France	121	946	1,067	South Africa	21	400	421
Germany	90	946	1,036	Spain	38	199	237
Greece	21	333	354	Sweden	96	928	1,024
Hong Kong	129	1,504	1,633	Switzerland	85	246	331
India	198	3,338	3,536	Taiwan	113	2,350	2,463
Indonesia	79	624	703	Thailand	154	652	806
Ireland	29	135	164	Turkey	12	389	401
Israel	10	682	692	United Kingdom	209	2,529	2,738
Italy	52	453	505	United States	1,499	10,574	12,073
Japan	409	4,589	4,998	Vietnam	17	1,180	1,197
Korea (South)	552	2,208	2,760				

Appendix B Description of Variables

Table B2: Periods of financial stress

Name	Description
COVID pandemic	A dummy that takes on a value of 1 in the months of March to June 2020, inclusive.
Taper tantrum	A dummy that takes on a value of 1 in the months of May 2013 to April 2014, inclusive.
Global financial crisis	A dummy that takes on a value of 1 in the months of December 2007 to June 2009, inclusive.

Table B3: Firm characteristics (source: Refinitiv Worldscope)

Name	Description
Log assets	Log of book value of total assets (converted to USD using constant 2011 U.S. dollars) at the end of the fiscal year ending in the previous calendar year.
Book leverage	Book value of total debt divided by book value of total assets, both at the end of the fiscal year ending in the previous calendar year. Winsorized at the 5% and 95% level.
Profitability	Annual net income for the fiscal year ending in the previous calendar year, divided by the book value of total assets at the end of the fiscal year ending in the previous calendar year. Winsorized at the 5% and 95% level.
Net debt	Book value of total debt minus cash, divided by book value of total assets, all at the end of the fiscal year ending in the previous calendar year. Winsorized at the 5% and 95% level.
Altman's Z-Score	Calculated based on the following formula: $1.2 * \text{working capital to total assets} + 1.4 * \text{retained earnings to total assets} + 3.3 * \text{earnings before interest and taxes to total assets} + 0.6 * \text{market value of equity to total liabilities} + 0.999 * \text{net sales to total assets}$. Winsorized at the 5% and 95% level.
Ohlson's O-Score	Calculated based on the following formula: $-1.32 - 0.407 * \text{log assets} + 6.03 * \text{total liabilities to total assets} - 1.43 * \text{working capital to total assets} + 0.076 * \text{current assets to current liabilities} - 1.72 * (\text{a dummy that takes on a value of 1 if total liabilities are greater than total assets}) - 2.37 * \text{net income to total assets}$. Winsorized at the 5% and 95% level.

Table B4: Issuance outcomes (source: Refinitiv Workspace)

Name	Description
Issuer dummy	A dummy equal to 1 in the months that a firm issues at least one bond, and 0 otherwise.
Dollar amount issued	The total amount of issuance (converted to USD using constant 2011 U.S. dollars) in a given firm-month.
Number of bonds issued	The number of bonds issued in a given firm-month.
Issuer dummy USD	A dummy equal to 1 in the months that a firm issues at least one USD-denominated bond, and 0 otherwise.
Issuer dummy local currency	A dummy equal to 1 in the months that a firm issues at least one bond denominated in their home currency, and 0 otherwise.
Weighted average spread	For months in which a firm issuance at least one bond, the average spread (coupon minus equivalent risk-free bond) on bonds issued, weighted by each bond's issuance size.

Table B5: Country-level variables

Name	Description	Source
Financial market depth	From the Financial Development Index Database, the financial market depth measures the size and liquidity of a country's financial markets (equities and debt securities).	IMF Data Portal
Foreign investors in debt markets	Foreign investors holdings of a country's debt as of Q1/2018, measured as a percentage of GDP.	IMF's Oct. 2018 GFSR, Figure 1.19
Size of local currency corporate bond market	Face value of corporate bonds denominated in a country's local currency as of year end 2019.	Bloomberg Finance LP
Chinn-Ito measure	Index measuring a country's degree of capital account openness, taken as of 2019.	Chinn-Ito website
Exchange rate regime (coarse)	The coarse classification of a country's exchange rate as of 2019 (1 = peg, 2 = crawling peg, 3 = managed floating, 4 = freely floating; we exclude 5 = freely falling and 6 = missing).	Ethan Ilzetzki's website

Table B6: Macroeconomic variables

Name	Description	Source
Level of 10-year yield	The monthly average 10-year yield in a firm's country of domicile.	Bloomberg Finance LP
Flow into bond funds as % of AUM	Net fund monthly flows into a country's bond mutual funds, divided by the previous month end's assets under management.	EPFR Global
Central bank assets as % of GDP	The monthly level of the level of a central bank's balance sheet, divided by monthly GDP; where monthly GDP not available, quarterly GDP is used for the three months in that quarter.	Haver Analytics

Appendix C USD Corporate Bond Issuance Propensity

Table C7: USD corporate bond issuance by large firms

This table shows panel regression results of bond issuance outcomes for the period from 2005 to 2021 for public firms in Refinitiv Worldscope. In the first panel, we show results for firms in the top quartile of their country-year's total assets (large) and for firms in the middle two quartiles (medium). In the second panel, we show results for firms in the middle two quartiles of their country-year's short-term debt to total debt (medium) and for firms in the top quartile (high). The dependent variable is *Issuer dummy USD* (a dummy that takes on a value of 1 if a firm issues at least one USD-denominated bond in a month and 0 otherwise). The independent variables of interest are the stress period dummies, defined in Section 2.1. The regressions include a linear quarterly time trend and country-by-industry fixed effects, and standard errors clustered at the firm level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Advanced Economies		China		Non-China Asian EMs	
Firm size	Large	Medium	Large	Medium	Large	Medium
<i>Dependent variable</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>
Mean	1.12%	0.04%	0.55%	0.01%	0.20%	0.00%
COVID pandemic	0.0142*** (0.00110)	-0.000183** (8.96e-05)	0.000111 (0.00107)	-5.98e-05*** (2.11e-05)	0.000666 (0.000456)	-5.43e-06 (2.30e-05)
Taper tantrum	0.00171*** (0.000453)	9.26e-05 (7.32e-05)	-0.000615 (0.000687)	-1.39e-05 (3.84e-05)	-0.000415* (0.000213)	3.79e-05 (3.42e-05)
Global financial crisis	-0.00128*** (0.000323)	-0.000294*** (3.08e-05)	-0.00125*** (0.000302)	-4.63e-05** (1.82e-05)	-0.000885*** (0.000199)	-1.91e-05 (1.69e-05)
Linear time trend (qtr)	0.00644*** (0.000868)	0.000395*** (9.24e-05)	0.0152*** (0.00202)	3.59e-05 (5.33e-05)	0.00112** (0.000476)	3.07e-05 (4.72e-05)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	1,027,315	2,045,863	205,208	410,017	579,535	1,155,192
R-squared	0.030	0.003	0.017	0.001	0.008	0.003

Sample:	Advanced Economies		China		Non-China Asian EMs	
ST debt (% of debt)	Medium	High	Medium	High	Medium	High
<i>Dependent variable</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>	<i>Issuer dummy USD</i>
Mean	0.54%	0.02%	0.04%	0.00%	0.05%	0.00%
COVID pandemic	0.00692*** (0.000612)	-5.45e-05 (0.000101)	0.000222 (0.000335)	-4.49e-05** (1.88e-05)	0.000143 (0.000141)	1.94e-05 (6.06e-05)
Taper tantrum	0.000869*** (0.000269)	0.000149 (9.89e-05)	0.000283 (0.000276)	2.22e-05 (6.36e-05)	-3.16e-05 (8.51e-05)	4.28e-05 (5.92e-05)
Global financial crisis	-0.000386** (0.000191)	-0.000118** (5.04e-05)	-0.000188*** (5.66e-05)	-4.16e-05 (2.76e-05)	-0.000133* (6.81e-05)	-2.52e-05 (4.12e-05)
Linear time trend (qtr)	0.00346*** (0.000495)	-3.23e-05 (0.000121)	0.000878*** (0.000246)	2.69e-05 (7.36e-05)	0.000106 (0.000165)	1.43e-05 (0.000101)
Controls						
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Country*Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	1,549,439	802,804	265,317	280,462	998,502	518,654
R-squared	0.031	0.006	0.001	0.000	0.004	0.004

Appendix D Issuance during COVID: Firm vs Country Characteristics

For each country-industry, we calculate average firm characteristics (size, profitability, leverage) at the end of 2019 (we follow Abraham et al. (2021) in looking at industry-level splits). We then run a series of regressions for increase in local currency issuance propensity during COVID that include these country-industry-level firm characteristics as well as the country-level characteristics. In addition to financial market depth and the size of the corporate bond market as a percentage of GDP, we also include country's 2019 Chinn-Ito index of capital account openness (Chinn and Ito, 2006) and exchange rate regime classification (Ilzetski et al., 2019). Finally, as an alternative to country-level characteristics, we include country fixed effects. The results are found in Table D8.

In column (1), we include only firm characteristics. Only country-industry profitability is significantly related to our measure of COVID increase in issuance, and the R-squared is 2.2%. In columns (2) to (5), we continue to include firm characteristics and we add our country-level characteristics individually. While only the size of pre-COVID corporate bond markets (a measure of the domestic investor base) is significantly positively related to COVID issuance propensity, the R-squared in these columns increases to between 2.3% and 4.1%. In column (6) we include all four country-level characteristics; the R-squared jumps to 5.0%, more than double the R-squared in the firm-characteristics-only regression in column (1). In this regression, both the size of the corporate bond markets and the Chinn-Ito measure of capital account openness are significantly positively related to the COVID local currency issuance propensity increase. In the last two columns, we add nation fixed effects, which absorb all of our country-level characteristics. Column (7) includes only nation fixed effects and has an R-squared of 5.2%. Finally, column (8) adds firm characteristics to the regression with nation fixed effects; this specification has an R-squared that jumps up to 10.2%.

Table D8: Firm vs. country characteristics during COVID-19

This table regression results analyzing the impact of firm and country characteristics on the relative increase in local currency bond issuance propensity during COVID. The regressions include a cross-section of industries in emerging economies. The dependent variable is the country-industry increase in local currency issuance propensity during COVID, calculated as the average local currency issuance propensity during these months minus the average local currency issuance propensity during all non-COVID months. Log assets, profitability and book leverage are country-industry means measured for firms in the sample at the end of 2019. Financial market depth, size of corporate bond market (as a % of GDP), Chinn-Ito index and exchange rate regime are all country-level variables measured at or before the end of 2019. The last two columns include nation fixed effects. Standard errors clustered at the nation level are shown below the coefficients; *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Sample:	Emerging markets							
<i>Dependent variable</i>	<i>LC issuance propensity difference in COVID</i>							
Log assets	0.00268 (0.00215)	0.00352 (0.00248)	0.00329 (0.00206)	0.00262 (0.00220)	0.00271 (0.00210)	0.00322 (0.00227)	0.00771* (0.00424)	
Profitability	0.0503** (0.0174)	0.0594*** (0.0203)	0.0474** (0.0215)	0.0557*** (0.0180)	0.0582** (0.0208)	0.0622** (0.0245)	0.0368 (0.0302)	
Book leverage	-0.0276 (0.0231)	-0.0203 (0.0263)	-0.0158 (0.0308)	-0.0256 (0.0215)	-0.0190 (0.0307)	-0.00538 (0.0338)	-0.0234 (0.0283)	
Fin'l mkt depth		0.0243 (0.0173)				-0.00137 (0.0165)		
Size of corp bond mkt (% of GDP)			0.00422** (0.00180)			0.00488** (0.00173)		
Chinn-Ito measure				0.00583 (0.00890)		0.0122* (0.00682)		
Exchange rate regime (coarse)					-0.00345 (0.00298)	-0.00195 (0.00196)		
Nation fixed effects	No	No	No	No	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	406	406	406	406	406	406	406	406
R-Squared	0.022	0.032	0.041	0.023	0.027	0.050	0.052	0.102