The Global Credit Cycle*

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Abstract

We explore the role of U. S. nonfinancial corporate credit spreads as a driver of global credit conditions. We use bond-level data on credit spreads and excess returns to estimate the relationship between global corporate bond returns and U. S. credit market conditions. We document that this relationship is non-linear, and that the international credit cycle is distinct from the global risk cycle. Furthermore, contrary to recent results that document that the relationship of global financial conditions with the VIX has weakened since the global financial crisis, the global credit cycle has remained robust and, indeed, has strengthened in some economies. Finally, we show that the global cycle as captured by U. S. credit spreads predicts international capital flows and real activity around the world.

JEL codes: F30, F44, G15, G12

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1 Introduction

Over the last 25 years, corporate bonds have been rising as a source of financing for nonfinancial corporations around the globe. While a growing literature in the aftermath of the global financial crisis (Rey, 2013, and the subsequent literature) has focused on documenting the global financial cycle in risky asset prices, capital flows, and the leverage of financial institutions, the effective lower bound for monetary policy in advanced economies, changes in global capital and liquidity regulations, and the expanding role of non-bank financial intermediaries in credit provision all call into question whether the global financial cycle – which captures changes in global risk appetite – is the same as the global credit cycle – which captures changes in the global allocation of credit to funding productive firms. In this paper, we use international bond-level data to explore the role of U. S. nonfinancial corporate credit spreads as a driver of global credit conditions.

We document three basic facts. First, the international credit cycle is distinct from the global financial cycle as captured by the VIX. Using cross-sectional information in panel data on bond-level corporate bond excess returns, we begin by showing that, consistent with the global financial cycle hypothesis, the VIX or, more precisely, a non-linear function of the VIX is a predictor of one month excess corporate bond returns globally, for a sample of advanced and emerging market economies. However, U. S. credit spreads, our measure of the global credit cycle, also predict one month excess corporate bond returns in our sample of countries, even after controlling for the VIX and the local credit cycle. Moreover, while the non-linear function of the VIX also remains statistically significant to a large extent after controlling for the global credit cycle, the economic contribution of the VIX to excess corporate bond returns is substantially smaller than the contribution of the global credit cycle and, indeed, of the local credit cycle.

Second, we document that the global credit cycle is persistent across both pre-crisis and post-crisis subsamples. In our sample of advanced economies, the global credit cycle remains a statistically significant predictor of corporate bond excess returns in the post-crisis period, even though the statistical significance of the local credit cycle increases in the post-crisis period. In contrast, for emerging market economies, the global credit cycle is more statistically significant in the post-crisis period, and the relationship with local credit spreads becomes more linear and less statistically significant. Consistent with diminished role of the global financial cycle in the post-2010 period documented in prior literature, the predictive relationship with the VIX, however, is significantly flatter in the post-crisis period.

Finally, we show that the global credit cycle predicts future unemployment growth at the one- to two-year-ahead horizon for the advanced economies in our sample. In contrast, the VIX does not systematically predict future unemployment growth at any horizon up to 3 years ahead. While our sample is relatively short, the reliability of the global credit cycle as a predictor of unemployment across different economies, even after controlling for the global financial cycle and the local credit cycle suggests that the global credit cycle extracted from corporate bond excess returns has meaningful information about future real activity.

A key element of the analysis in this paper is using the international debt market consolidated data from Boyarchenko and Elias (2023). The consolidated debt market data allow us to supplement secondary corporate bond market quotes from ICE Global Indices for a large cross-country panel of non-financial corporate bonds with balance sheet and expected default frequencies data at the ultimate corporate parent level. Using the ultimate corporate parent information furthermore allows us to correctly assign corporate bonds to their country of domicile, even if an individual bond is issued by a financing subsidiary abroad.

This paper is related to several strands of literature. First, the paper contributes to the literature on the Global Financial Cycle (GFCy) which highlights the importance of global factors in driving local credit and business cycles. Rey (2013) discusses the existence of a GFCy in capital flows, asset prices, and credit growth and the effect this has on other countries' monetary policy independence. Miranda-Agrippino and Rey (2020) discuss the importance of U. S. monetary policy as a driver of the GFCy, and Miranda-Agrippino and Rey (2015) study the importance of the GFCy as a driver of world assets returns.

Second, our paper contributes to the literature that uses the VIX as a proxy for global risk appetite. While the VIX may be a reasonable proxy for risk appetite for global equity markets, segmentation between equity and fixed income markets due to, for example, the participation of different types of intermediaries (see e.g. Haddad and Muir, 2021) may make the VIX less relevant as a measure of global risk appetite in credit markets.

The shortcomings of the VIX as a proxy for global risk appetite seem confirmed by a number of recent papers that find a decreased role for the VIX as a global factor in the post-GFC period. Avdjiev et al. (2020) document that while the sensitivity of both cross-border loan and international bond flows to U. S. monetary policy increased after the GFC (peaking in 2013), the sensitivity of cross-border bank loan flows to global risk conditions declined considerably post-crisis and became similar to the traditionally lower risk sensitivity of international bond flows. Forbes and Warnock (2021) find that the strong relationship between global risk and the incidence of extreme capital flow events observed in the pre-GFC period disappears in the post-crisis period. More broadly, Goldberg (2023) discusses changes on the drivers of global liquidity since the crisis.

Given potential market segmentation and the rise in the preponderance of marketable debt in the post-GFC period, global credit conditions might be better captured by measures that come directly from credit markets. Our measure of global credit conditions, U. S. corporate bond spreads, is constructed directly from capital markets' data and, as such, does not suffer from some of the challenges described above.

Third, our paper contributes to the literature using cross-sectional return predictability to measure common factors in risky asset returns and the economic content of those common factors for future real activity. From an econometric approach perspective, our paper is most closely related to Adrian et al. (2019), who propose a non-parametric approach to measuring the nonlinear relationship between U. S. equity and Treasury returns and the VIX. Adrian et al. (2019) show that a nonlinear function of the VIX captures "flight-to-safety" between U. S. equity and Treasury markets. We take the intuition of a nonlinear relationship between returns and global risk factors further, and show that the risk factors extracted in this way from return predictability regressions predict real activity, an exercise close in spirit to Bryzgalova and Julliard (2020) and the literature within.

Finally, this paper contributes to the literature on the predictive content of credit spreads for future real activity. Gilchrist et al. (2009), Gilchrist and Zakrajšek (2012), López-Salido et al. (2017), Krishnamurthy and Muir (2017) and subsequent literature show that corporate bond credit spreads predict future real activity in the U. S. Corporate bond credit spreads have also been shown to predict real activity across a number of other, primarily advanced, economies (Okimoto and Takaoka, 2017; Gilchrist and Mojon, 2018; Leboeuf and Hyun, 2018; Carabarín Aguirre and Peláez Gómez, 2021). Our results on the predictability of real activity focus instead on the differential role of the global credit cycle relative to the local credit cycle.

The rest of the paper is organized as follows. In Section 2, we describe the data we use and discuss some patterns in global bond spreads. In Section 3, we present our main results centered around bond return predicability. Section 4 explores how the role of global factors has changed after the GFC. Section 5 discusses our results on real activity predictability using the global credit cycle. Section 6 concludes.

2 Data description

We rely on the comprehensive international debt market data collected in Boyarchenko and Elias (2023), which puts together primary and secondary corporate bond market data together with data on corporate debt outstanding, firm balance sheets, and firm default probabilities across a number of countries. The matching between individual bonds and firm-level information is done at the ultimate corporate parent level, implicitly assuming that the characteristics of the ultimate parents play a central role in corporate bond prices even for bonds issued by subsidiaries. The extant empirical literature on internal capital markets has indeed argued for the existence of group-wide optimization of financing costs, with the parent company playing an intermediation role in allocating resources across subsidiaries.

We use secondary bond market quotes from ICE Global Bond Indices. As noted in Kelly et al. (2023), ICE data is considered the "gold standard" for corporate bond data because of breadth of coverage relative to data on transactions-based prices and analytics provided as part of the ICE dataset. Our main dataset starts in January 1998 and ends in December 2022, covering both periods of stress such as the global financial crisis and the COVID-19 pandemic, as well as more "normal" periods. We focus in this paper on secondary market pricing information as it captures the potential cost of capital for both companies issuing new debt as well as companies unable/unwilling to issue in a given period.

We define our universe of corporate bonds to be the underlying constituents at a monthly frequency from the ICE Global Corporate Index (G0BC) and ICE Global High Yield Corporate Index (HW00).[1] The underlying constituents data includes effective option-adjusted spread and duration for each bond-day, as well as bond and issuer characteristics, such as issuer domicile, issuer industry, currency of issuance, coupon type and rate, bond seniority, and call and put provisions. We use observations as of the third Wednesday of every month to ensure that the pricing is not affected by month-end index rebalancing activity. Throughout, in constructing country-level average counterparts to bond-level yields and credit spreads, we compute the amount-outstanding-weighted average of nonfinancial corporate bond yields and credit spreads.

[1] One potential concern with using the secondary market pricing from the ICE Global Bond Indices is coverage relative to the universe of corporate bonds outstanding. However, Boyarchenko and Elias (2023) show that a substantial fraction of the offering amount from a consolidated SDC Platinum – Mergent FISD dataset appears in the two ICE Global Bond Indices we use at some point over its lifetime.

For example, Figure 1 plots the time series of weighted-average nonfinancial corporate bond yields for the 10 largest (by number of nonfinancial corporate bond issues) advanced economy and emerging market economy countries. For each country $\mathcal{K}$ and each month t, we compute the country-level nonfinancial corporate bond yield as the amount-outstanding-weighted average of bond yields for all bonds associated with ultimate parent companies domiciled in that country

$$y_{\mathcal{K},t} = \sum_{b(f), f \in \mathcal{K}} \omega_{b(f),t} y_{b(f),t},$$

where $\omega_{b(f),t}$ is the fraction of aggregate amount outstanding (in USD equivalents) in country $\mathcal{K}$ in month t represented by bond $b(f)$.

Figure 1 shows that, prior to the post-COVID-19 pandemic monetary policy tightening, corporate bond yields for advanced economy countries have on average been declining in our sample period, outside of periods of stress such as the global financial crisis and the market dislocations associated with the COVID-19 pandemic. The figure also shows a large degree of commonality in the evolution of corporate bond yields in advanced economies. The convergence in advanced economy corporate bond yields to a common credit cycle comes against the backdrop of a shortening effective duration of corporate bonds in the same countries (Figure 2). Corporate bond yields in emerging market economies instead show more individual cycles for a large part of the sample and a more stable distribution of effective duration.

We follow Boyarchenko and Elias (2023) in merging the secondary market corporate bond quotes with bond characteristics from consolidated SDC Platinum – Mergent FISD, ultimate parent balance sheet information, and expected default frequency (EDF) data from Moody's KMV CreditEdge. For both balance sheet information and EDFs, we use data that most closely precedes the date of the observed secondary bond market quote. This ensures that the firm characteristics and EDF data are observable to market participants as of the pricing date. Thus, we use annual balance sheet data for the fiscal period ending at least three months prior to the pricing date, and EDF data as of the last day of the month prior to the pricing date.

We are interested in understanding how credit spreads behave at a country-aggregate level. To put bonds issued by firms with ultimate parents in the same country on an equal footing, we adjusted the observed credit spreads for differences in bond duration and currency. More specifically, given a market price yield on security b of firm f on date t issued in currency c with duration $d^c_{b(f),t}$, we first compute the duration-matched credit spread as

$$s^c_{b(f),t} = y^c_{b(f),t} - z^c_{b,d},$$

where $z^c_{b,d}$ is the yield on the duration-matched sovereign bond in the corresponding currency. The duration-matched credit spreads make bonds issued with different coupon payment schedules and maturity but same currency comparable across issuers.

We then follow Liao (2020) to convert duration-matched credit spreads across different currencies to the implied USD-based credit spread. Using bonds of firms that issue in multiple currencies, we estimate repeated cross-sectional regressions of the duration-matched credit spreads on currency, firm and rating fixed effects:

$$s^c_{b(f),t} = \alpha_{c,t} + \alpha_{f,t} + \alpha_{rating,t} + \epsilon_{b(f),t}.$$

The currency-adjusted duration-matched credit spread is then given as the difference between the currency-specific duration-matched credit spread and the average credit spread differential to USD-denominated corporate bonds:

$$s^{\$}_{b(f),t} = s^c_{b(f),t} - \left(\alpha_{c,t} - \alpha_{\$,t}\right).$$

Figure 3 plots the time series of the average credit spread differential to USD-denominated corporate bonds for the currencies present in our sample. Similar to the results in Liao (2020), Figure 3 shows that currency credit spread differentials were small in the pre-crisis period, increased significantly during the global financial crisis, and, though narrowed somewhat from their crisis-period highs, have remained elevated in the post-crisis sample.

Adjusting the weighted average yields we saw in Figure 1 for duration and currency differentials reveals the global nature of the credit cycle, especially for advanced economies. The weighted-average nonfinancial currency-adjusted duration-matched credit spreads plotted in Figure 4 comove together to a large extent, with the local credit cycle an amplification of the global pattern.

Finally, as in Gilchrist and Zakrajšek (2012), we estimate the component of log-duration-matched spreads that can be explained by bond and firm characteristics and firm expected default frequencies

$$\log s^{\$}_{b(f),t} = \alpha_I + \alpha_{CR} + \gamma \log \mathrm{EDF}_{f,t-1} + \vec{\beta}'_{\mathrm{bond}} X_{bond,t} + \vec{\beta}'_{\mathrm{firm}} X_{firm,t-1} + \epsilon_{b(f),t}, \tag{1}$$

where the vector of contemporaneous bond characteristics $X_{bond,t}$ includes (log) amount outstanding in USD equivalents, (log) duration, (log) coupon rate, (log) age, and a dummy for bond callability. The regression also controls for a number of lagged firm characteristics at the ultimate parent level $X_{firm,t-1}$ – (log) firm size (in USD), profitability, leverage and asset tangibility, as well as the ultimate-parent-level one year EDFs, and includes industry and rating fixed effects. The default-adjusted credit spread is then the difference between the realized duration-matched spread for each bond observation and the duration-matched spread predicted from the above regression.

Table 1 reports the estimated coefficients from regression (1) for the 10 largest advanced economy and emerging market economy countries. The coefficient on (log) one year EDFs is remarkably stable across countries, suggesting that global credit spreads price default risk in a systematic fashion across countries. In the time series, Figure 5 shows that adjusting for predictable variation in credit spreads due to bond and firm fundamentals brings the country-level credit cycles even more in-line with each other, even for emerging market economies. In the rest of the paper, we explore the global credit cycle and its implications for real activity.

3 The global credit cycle

This section introduces U. S. credit spreads as our measure of the global credit cycle. Using a rich panel of cross-country corporate bond returns, we show that the global credit cycle is distinct from both the global financial cycle and local (country-level) credit cycles. We begin by introducing the construction of corporate bond returns in our setting and then present results on return predictability, progressing from bond-level variables to common, potentially non-linear, covariates.

3.1 Returns and baseline return predictability

Our analysis uses a large, cross-country panel of price and spread data on individual non-financial corporate bonds. As is standard in the academic literature (see e.g. Bekaert and De Santis, 2021; Kelly et al., 2023; Dickerson et al., 2023) and in industry practice, we define the one month return between date t and $t+1$ on bond b issued by firm f in currency c as

$$R^c_{b(f),t+1} = \frac{P^c_{b(f),t+1} + \mathrm{AI}^c_{b(f),t+1} + \mathrm{Coupon}^c_{b(f),t,t+1}}{P^c_{b(f),t} + \mathrm{AI}^c_{b(f),t}} - 1,$$

where $P^c_{b(f),t}$ is the bond's price at date t, $\mathrm{AI}^c_{b(f),t}$ is its accrued interest as of date t, and $\mathrm{Coupon}^c_{b(f),t,t+1}$ are coupons (if any) paid on the bond between date t and $t+1$.

As with the calculation of the currency-adjusted credit spreads in the previous section, we take the perspective of a U. S. investor in computing the excess returns on bond b at date t. Thus, we convert the currency-specific return $R^c_{b(f),t}$ to implied USD returns using exchange rates and use the yield on the one-month U. S. Treasury bill as our measure of the relevant one-month risk-free rate. That is, the USD-based one month excess return, $Rx_{b(f),t}$, is computed as

$$Rx_{b(f),t+1} = \left(1 + R^c_{b(f),t+1}\right) \frac{S^c_{t+1}}{S^c_t} - (1 + y_{1\mathrm{m},t}) \,,$$

where S^c_t is the spot exchange rate of currency c with respect to the USD at date t and $y_{1\mathrm{m},t}$ is the one-month U. S. Treasury bill rate as of date t. For both the exchange rate and the risk-free rate observations, we match the date of the observation to the exact date of the corporate bond price (and spread) observation. Finally, we construct multi-period corporate bond excess returns by cumulating the one-month-ahead corporate bond excess returns:

$$Rx_{b(f),t+h} = \prod_{s=1}^{s=h} Rx_{b(f),t+s-1,t+s}.$$

Table 2 reports the Hodrick (1992) t-statistics[2] from the baseline predictive regression of corporate bond excess returns on bond credit spreads and bond characteristics

$$Rx_{b(f),t+h} = \beta_{d,h} d_{b(f),t} + \beta_{cs,h} \hat{s}^{\$}_{b(f),t} + \vec{\gamma}'_h X_{b,f,t} + \epsilon_{b(f),t+h}, \tag{2}$$

where $d_{b(f),t}$ and $\hat{s}^{\$}_{b(f),t}$ are the unexplained and predicted components, respectively, of currency-adjusted duration-matched spreads from (1) as of date t, and $X_{b,f,t}$ is a vector of bond and firm characteristics, including the bond's effective duration and convexity. The

[2] Ang and Bekaert (2007) strongly argue in favor of Hodrick (1992) over Newey and West (1987) standard errors in return predictability regressions with overlapping observations, as the former exhibit substantially better size control, a fact confirmed in simulation evidence in e.g. Wei and Wright (2013) and Adrian et al. (2019).

baseline return predictability specification (2) captures the Campello et al. (2008) intuition that corporate bond expected excess returns are related to the excess bond yield, duration, scaled by credit spread changes, and convexity, scaled by the square of credit spread changes. Consistent with both the default-adjusted and the predicted credit spreads capturing components of corporate bond risk premia, Table 2 shows that, at the bond level, both components of credit spreads are significant predictors of excess corporate bond returns across horizons, even as we progressively add more fixed effects.

3.2 Return predictability and aggregate financial conditions

We now turn to investigating the common variation in excess corporate bond returns within and across countries. We extend specification (2) above to include aggregate conditions v

$$Rx_{b(f),t+h} = \beta^{\mathcal{K}}_{v,h}\phi^{\mathcal{K}}_{h}\left(v_t\right) + \beta^{\mathcal{K}}_{d,h}d_{b(f),t} + \beta^{\mathcal{K}}_{cs,h}\hat{s}^{\$}_{b(f),t} + \vec{\gamma}^{\mathcal{K},\prime}_{h}X_{b,f,t} + \epsilon_{b(f),t+h}, \tag{3}$$

where the superscript $\mathcal{K}$ emphasizes that we allow for a differential relationship between excess corporate bond returns and aggregate and bond- and firm-specific characteristics across countries. As in Adrian et al. (2019), we allow for a potentially non-linear relationship between risky asset (in our case, corporate bond) returns and aggregate conditions v, and approximate the full non-parametric function $\phi^{\mathcal{K}}_{h}\left(v_t\right)$ as a third order polynomial

$$\phi^{\mathcal{K}}_{h}\left(v_t\right) = \varphi^{\mathcal{K}}_{0,h} + \varphi^{\mathcal{K}}_{1,h}v_t + \varphi^{\mathcal{K}}_{2,h}v_t^2 + \varphi^{\mathcal{K}}_{3,h}v_t^3.$$

This cubic representation is sufficiently flexible to allow for time-varying expected excess returns due to, for example, occasionally-binding aggregate intermediary constraints while remaining parsimonious.

A natural candidate for the aggregate conditions v is the VIX, which, as shown in Miranda-Agrippino and Rey (2015), is highly correlated with the global factor that captures a significant part of the global co-movement between asset prices. The first column for each country in Table 3 reports the Hodrick (1992) t-statistic for the coefficient of regression (3) on a linear function of the VIX for the full 1998 – 2022 sample. While the VIX is highly statistically significant as a predictor of corporate bond excess returns in the U. S., with higher realizations of the VIX corresponding to larger excess returns, it is not systematically significant in other countries and, indeed, sometimes has a counterintuitive negative coefficient.

However, when we allow for a non-linear relationship with the VIX as in Adrian et al. (2019), the cubic VIX polynomial is a statistically significant predictor of excess corporate bond returns for all the advanced economies in our sample, both individually and as a panel. Indeed, the null hypotheses of $\varphi^{\mathcal{K}}_{0,h} = \varphi^{\mathcal{K}}_{1,h} = \varphi^{\mathcal{K}}_{2,h} = 0$ and $\varphi^{\mathcal{K}}_{1,h} = \varphi^{\mathcal{K}}_{2,h} = 0$ are rejected for all 9 advanced economies. While the non-linearity of the relationship between corporate bond excess returns and the VIX is not as systematic in the emerging market economies, with the p-value test failing to reject the linearity assumption in China and Brazil, the results from the emerging market economies panel regression in column (38) suggest that the overall relationship is highly non-linear in emerging market economies as well.

3.3 U. S. credit cycle as the global credit cycle

While the VIX is correlated with global financial cycles, Shin (2016) argues that, as corporate bond markets become a more prominent source of financing for nonfinancial corporations globally, measures of global risk factors more closely aligned with constraints of traditional intermediaries, such as the VIX, may be less relevant in explaining excess returns. In this section, we propose the U. S. nonfinancial corporate bond credit spread as a proxy for the global credit cycle. While traditional intermediaries do play a significant role in the origination of corporate bonds and intermediate secondary corporate bond markets, corporate bonds are mostly held by non-bank financial intermediaries. The U. S. credit spread thus has the potential advantage of capturing the constraints faced by the overall marginal intermediary in corporate bond markets.

The third column for each country in Table 3 reports the Hodrick (1992) t-statistics for the coefficients of regression (3) on a cubic polynomial of U. S. credit spreads. The table shows that the cubic polynomial of U. S. credit spreads is a significant predictor of corporate bond excess returns across all countries in our sample, both for the advanced and the emerging market economies. Furthermore, we reject the null hypothesis of no relationship with U. S. credit spreads as well as the null hypothesis of a linear relationship with U. S. credit conditions. Thus, there is a global credit cycle that can be proxied by U.S. credit conditions.

So is the global credit cycle distinct from the global financial cycle captured by the VIX? The last column for each country of Table 3 shows that that is indeed the case: When we allow for a non-linear relationship of excess corporate bond returns with both the VIX and the U. S. credit spread, both components remain significant for most countries in our sample.

One potential concern with U. S. credit spreads as a proxy for the global credit cycle is that, as we saw in Figure 4, country-level credit spreads are highly correlated across countries. That is, U. S. credit spreads in the return predictability results in Table 3 may just be a noisy measure of local (country-level) credit spreads instead of a measure of the global credit cycle. Table 4 controls for a possible non-linear relationship of excess corporate bond returns with the local country-level credit spread. The results in Table 4 show two striking features. First, there is a non-linear relationship with U. S. credit spreads even after we control for local credit market conditions. Second, the local credit market conditions contain additional predictive information for corporate bond excess returns.

Put together, the results in Tables 3 and 4 show that the global credit cycle is distinct from the global financial cycle but does not capture fully the local credit market conditions. Table 5 confirms that that is also the case for longer predictive horizons. Indeed, for longer horizons, the predictive relationship of the VIX for corporate bond returns in emerging market economies all but disappears, while both global and local credit market conditions remain significant predictors at horizons up to 12 months.

We conclude this section by examining the time series of the contributions of the VIX, the U. S. credit spreads, and local credit spreads to (risk-adjusted) average excess returns within each country. Figure 6 shows that the contribution of the VIX to excess corporate bond returns is substantially smaller than the contribution of either the global or the local credit cycles. Moreover, the contribution of the VIX declines during periods of corporate bond market stress, such as during the global financial crisis, the European sovereign debt crisis, and the COVID-19 pandemic, once again highlighting the distinct nature of the global credit cycle relative to the global financial cycle.

4 The persistent role of the global credit cycle

The global corporate bond market has evolved substantially over the course of our sample, with corporate bond market issuance accelerating worldwide after the global financial crisis. This global expansion of marketable debt securities has come against the backdrop of the effective lower bound to monetary policy in many advanced economies, a changing global regulatory landscape, and the expansion of credit intermediation through non-bank financial intermediaries. In this section, we study whether the nature of the global credit cycle has shifted in response to global market developments.

4.1 Global credit cycle pre- and post-crisis

We investigate whether the global nature of the credit cycle has changed substantially after the global financial crisis by estimating the predictive relationship (3) separately for pre-crisis (January 1998 – July 2007) and post-crisis (January 2010 – December 2019) subsamples.[3] Starting with the one-month-ahead predictive relationship, Table 6 shows that, for advanced economies, U. S. credit spreads are a statistically significant predictor of global corporate bond excess returns in both the pre-crisis and the post-crisis periods. The statistical significance of U. S. credit spreads is somewhat lower for these economies in the post-crisis subsample, while the statistical significance of the local credit spread increases in this later sub-period. In contrast, for emerging market economies, global credit spreads are more statistically significant in the post-crisis period, while the relationship with local credit spreads becomes more linear and less statistically significant. This suggests that the period 2010 – 2019 in emerging market economies was characterized not only by an increase in non-financial corporate bond issuance but a greater integration with the global credit cycle. Table 7 furthermore shows that the global credit cycle is remains a persistent predictor of global corporate bond excess returns across different horizons in the post-crisis period.

The results in Table 6 also suggest a potential change in the predictive relationship of the VIX with corporate bond excess returns. We illustrate the changing nature of the relationship between future corporate bond excess returns and the global financial cycle, the global credit cycle, and the local credit cycle in Figure 7. More specifically, the left column of Figure 7 plots the contributions $\phi_1^{\mathcal{K}}(\text{VIX}_t)$, $\phi_1^{\mathcal{K}}(\text{U.S. credit spread}_t)$, and $\phi_1^{\mathcal{K}}(\text{Local credit spread}_t)$ from the VIX, U. S. credit spreads, and local credit spreads, respectively, to normalized bond excess returns in the pre-crisis period, while the right column plots the same contributions in the post-crisis period. In both cases, the contributions are normalized by the subperiod-country-level standard deviation of bond excess returns to make the estimates comparable cross-country and across different subperiods. Starting with the top row, we see that the predictive relationship with the VIX is significantly flatter in the post-crisis period. Moreover, the contribution of the VIX to bond excess returns becomes negative on average for a number

[3] Note that, in performing this subsample analysis, we exclude the COVID-19 pandemic and post-pandemic periods all together as there may have been further structural changes in global financial markets after the COVID-19 pandemic that our post-pandemic sample is not long enough to capture.

of countries, highlighting the weakening of the global financial cycle documented in prior studies.

In contrast, in the middle row, we see that the relationship with U. S. credit spreads remains highly non-linear, and the magnitude of the contribution of U. S. credit spreads to global corporate bond excess returns increases in the post-crisis period. This suggests that, not only has the global credit cycle remained persistent over the course of our sample but it may have become even more integrated in the 2010 – 2019 subperiod.

Finally, the bottom row of Figure 7 shows that the relationship with the local credit cycle is virtually unchanged across the two subperiods.

It is worth highlighting that the results in Table 6 and Figure 7 show the persistent nature of the global credit cycle even after excluding the global financial crisis and the market disruptions associated with the COVID-19 pandemic. At first glance, this may seem surprising given that prior studies on the predictive power of credit conditions rely on periods of heightened market stress to identify the predictive relationship. Using granular data on corporate bond returns allows us instead to identify the predictive relationship from cross-sectional information.

4.2 Decomposing the global credit cycle

We have focused so far on the overall global credit cycle, characterized by the overall U. S. nonfinancial corporate bond duration-matched credit spread. We conclude this section by investigating whether the predictable part plays a different role than the unexplained part of credit spreads, both in terms of the global and the local credit cycles.

Table 8 reports the Hodrick (1992) t-statistics for the coefficients of regression (3) on a cubic polynomial of the VIX, cubic polynomials of the default-adjusted and predicted components of U. S. credit spreads, and cubic polynomials of the default-adjusted and predicted components of local credit spreads. For advanced economies, while both the predicted and the default-adjusted credit spreads are significant predictors of corporate bond returns both pre- and post-crisis, the predicted components of U. S. credit spreads and local credit spreads become more significant after the global financial crisis. This is not surprising: in the 2010 – 2019 period, the predicted component of credit spreads accounts for almost all of the variation in the U. S. non-financial corporate credit spread, as can be seen in Figure 8. Likewise, for the rest of the advanced economies in our sample, a larger portion of the overall credit spread is predictable in the post-crisis period, reflecting perhaps overall compressed risk premia in the presence on an effective lower bound for monetary policy.

For the emerging market economies, instead, pre-crisis, the global credit cycle is primarily captured by the default-adjusted component of U. S. credit spreads. Consistent with the results we saw in Panel (b) of Table 6 above, both the default-adjusted and the predicted components of U. S. credit spread become more significant as predictors of emerging market corporate bond excess returns in the post-crisis period, once again suggesting greater integration of emerging market economies with the global credit cycle in 2010 – 2019.

5 Credit market conditions and real outcomes

In this, we provide suggestive evidence that the global credit cycle we documented above has real implications.

5.1 The global credit cycle and international capital flows

We begin by studying the implications of the global credit cycle for international capital flows, using quarterly data 1998 Q1 – 2022 Q4 from the IMF International Statistics. We estimate the following predictive regression for H-period ahead capital flows as a function of lagged capital flows, monetary policy, global financial cycle, and global and local credit cycles

$$\text{Flow}_{t+H}^{\mathcal{K}} = \alpha^{\mathcal{K}} + \sum_{l=1}^{3} \varphi_l^{\mathcal{K}} \text{Flow}_{t-l}^{\mathcal{K}} + \beta_{Policy}^{\mathcal{K}} \text{Real policy rate}_{\mathcal{K},t} \tag{4}$$

$$+ \gamma_{VIX}^{\mathcal{K}} \phi^{\mathcal{K}} (\text{VIX}_t) + \gamma_{US}^{\mathcal{K}} \phi^{\mathcal{K}} (\text{U.S. credit}_t) + \gamma_{Lcl}^{\mathcal{K}} \phi^{\mathcal{K}} (\text{Local credit}_t) + \epsilon_{t+H}^{\mathcal{K}},$$

where, as above, $\phi_1^{\mathcal{K}} (\text{VIX}_t)$, $\phi_1^{\mathcal{K}} (\text{U.S. credit spread}_t)$, and $\phi_1^{\mathcal{K}} (\text{Local credit spread}_t)$ are the contributions from the VIX, U. S. credit spreads, and local credit spreads, respectively, to normalized one month bond excess returns in country $\mathcal{K}$. For advanced economies, the predictive regression also includes the 10 year – 3 month sovereign yield slope.

Starting with the relationship between overall capital flows and the global financial cycle, and global and local credit cycles for the countries in our sample in the top row of Table 9, we see that, for advanced economies, the global credit cycle has a statistically significant relationship with both total capital inflows and total capital outflows over and above that predicted by the global financial cycle. Contemporaneously ($H = 0$), both the global credit cycle and the global financial cycle are statistically significant predictors of capital flows, with increases in either the global financial cycle as measured by $\phi_1^{\mathcal{K}} (\text{VIX}_t)$ or the global credit cycle as measured by $\phi^{\mathcal{K}} (\text{U.S. credit}_t)$ corresponding to decreases in total capital flows. At the one-quarter-ahead horizon ($H = 1$), however, the relationship with the global financial cycle has a counterintuitive positive coefficient once we control for the global credit cycle, and is not longer a statistically significant predictor of capital flows at the one-year-ahead ($H = 4$) horizon. For emerging market economies, in contrast, almost all of the predictability comes from the local credit cycle, with both the global financial and the global credit cycles playing a limited role.

The remaining rows of Table 9 decompose total capital flows into the four underlying components – bank,[4] debt, equity, and direct investment (FDI). The table shows that the predictability of total capital flows comes primarily through the predictability of bank and debt flows.

5.2 The global credit cycle and real activity

Recent literature (see e.g. Gilchrist et al., 2009; Gilchrist and Zakrajšek, 2012; López-Salido et al., 2017; Krishnamurthy and Muir, 2017) has stressed the predictive content of credit spreads for future real activity, in both the U. S. as well as other economies (Okimoto and Takaoka, 2017; Gilchrist and Mojon, 2018; Leboeuf and Hyun, 2018; Carabarín Aguirre and Peláez Gómez, 2021). We now study whether the global credit cycle has differential predictive information for local real outcomes over and above the local credit cycle. More formally, similar to Gilchrist and Zakrajšek (2012), we estimate the following predictive regression for cumulative H-period ahead unemployment growth as a function of lagged unemployment growth, monetary policy, global financial cycle, and global and local credit cycles

$$\begin{aligned}\Delta \mathrm{UR}^{\mathcal{K}}_{t,t+H} = \alpha^{\mathcal{K}} + \varphi^{\mathcal{K}} \Delta \mathrm{UR}^{\mathcal{K}}_{t-H,t} + \beta^{\mathcal{K}}_{Policy} \text{Real policy rate}_{\mathcal{K},t} \\ + \gamma^{\mathcal{K}}_{VIX} \phi^{\mathcal{K}}\left(\mathrm{VIX}_t\right) + \gamma^{\mathcal{K}}_{US} \phi^{\mathcal{K}}\left(\text{U.S. credit}_t\right) + \gamma^{\mathcal{K}}_{Lcl} \phi^{\mathcal{K}}\left(\text{Local credit}_t\right) + \epsilon^{\mathcal{K}}_{t+H},\end{aligned} \tag{5}$$

where, as above, $\phi^{\mathcal{K}}_1\left(\mathrm{VIX}_t\right)$, $\phi^{\mathcal{K}}_1\left(\text{U.S. credit spread}_t\right)$, and $\phi^{\mathcal{K}}_1\left(\text{Local credit spread}_t\right)$ are the contributions from the VIX, U. S. credit spreads, and local credit spreads, respectively, to normalized one month bond excess returns in country $\mathcal{K}$. For advanced economies, the predictive regression also includes the 10 year – 3 month sovereign yield slope.

Table 10 reports the estimated coefficients on the global financial cycle, and global and local credit cycles for the countries in our sample at the 3-month-ahead, and one-, two-, and three-year-ahead horizons. Three features are worth noting. First, across all horizons, the global

[4] As is standard in the literature, we use "other investment", which contains bank loans and trade credit.

financial cycle as measured by $\phi_1^{\mathcal{K}}(\mathrm{VIX}_t)$, does not have systematic predictive information for future unemployment rates. Second, the global credit cycle predicts unemployment growth for almost all advanced economies individually and as a panel at the one to two year horizon, suggesting that the predictive information of U. S. credit spreads for global corporate bond market returns also contains information about future real outcomes. In contrast, while the local credit cycle has limited predictive information for future unemployment in advanced economies in the shorter run (up to one year ahead), it is more systematically a predictor of unemployment growth at the two-to-three year horizon. Finally, there is limited systematic unemployment growth predictability from the global financial cycle, and global and local credit cycles for emerging market economies.

Overall, the results in Table 10 suggest that the global credit cycle, over and above the local credit cycle, has predictive information about future real outcomes for at least the advanced economies. Although we have a relatively short sample (25 years at most) over which we can measure both the U.S. and the local credit cycles together, the reliability of the global credit cycle as a predictor of unemployment across different economies provides reassurance about the robustness of these results.

6 Conclusion

We introduce U. S. credit spreads, built from a comprehensive dataset of corporate bond spreads and firm characteristics, as a measure of the global credit cycle. We show that our measure of the global credit cycle predicts both corporate bond returns and real activity globally, across a sample of advanced and emerging market economies. Furthermore, we document that the global credit cycle is distinct from both the global financial cycle – as proxied by the VIX – and the local credit cycle. Unlike the global financial cycle, the role of the global credit cycle in explaining corporate bond returns appears undiminished in the post-crisis period.

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Table 1: Estimated relationship between secondary market duration-matched, currency adjusted spreads and characteristics. This table reports the estimated coefficients from the regression of secondary log duration-matched, currency-adjusted spreads on firm-level 1 year expected default frequency (EDF) and bond characteristics. All regression include 2 digit SIC industry and rating fixed effects. Standard errors clustered at the issuer-quarter level reported in parentheses below the point estimates.*** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Advanced economies

	US	KR	JP	CA	GB	NL	FR	TW	AU	DE
Log EDF	0.13	0.15	0.16	0.13	0.14	0.10	0.15	0.11	0.18	0.12
	(0.00)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.03)***	(0.01)***	(0.01)***
Sub in home country	0.06	0.05	0.10	-0.02	0.03	-0.05	0.01	-0.15	0.01	0.03
	(0.01)***	(0.03)	(0.02)***	(0.01)*	(0.01)**	(0.03)	(0.01)	(0.07)*	(0.03)	(0.02)*
Sub in foreign country	0.08	-0.09	-0.10	0.05	0.12	0.13	0.03	0.00	0.01	0.12
	(0.02)***	(0.07)	(0.03)***	(0.02)***	(0.02)***	(0.03)***	(0.03)	(.)	(0.15)	(0.02)***
Log duration	0.35	0.17	0.10	0.33	0.31	0.26	0.25	0.14	0.26	0.26
	(0.00)***	(0.02)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.03)***	(0.01)***	(0.01)***
Log coupon	0.33	0.16	0.07	0.46	0.19	0.21	0.15	0.20	0.29	0.14
	(0.01)***	(0.02)***	(0.01)***	(0.02)***	(0.01)***	(0.01)***	(0.01)***	(0.04)***	(0.02)***	(0.01)***
Log age	-0.00	0.02	-0.04	-0.02	-0.02	-0.01	-0.03	0.04	-0.04	-0.02
	(0.00)*	(0.01)***	(0.00)***	(0.00)***	(0.00)***	(0.01)	(0.00)***	(0.02)**	(0.01)***	(0.00)***
Callable	0.01	0.01	-0.02	0.02	-0.06	0.04	-0.07	0.15	0.02	-0.07
	(0.01)**	(0.04)	(0.02)	(0.01)*	(0.01)***	(0.02)**	(0.01)***	(0.08)*	(0.01)	(0.02)***
Log amt out (USD)	-0.03	-0.10	-0.03	-0.03	0.01	0.03	-0.00	-0.04	-0.00	0.07
	(0.00)***	(0.02)***	(0.01)***	(0.01)***	(0.01)	(0.01)***	(0.01)	(0.03)	(0.01)	(0.01)***
W/in adj. R-sqr.	0.42	0.19	0.17	0.41	0.34	0.31	0.35	0.28	0.28	0.32
N. of obs	725029	10986	77396	92902	90330	12749	60276	889	13778	53839
N. of clusters	41923	940	4398	4512	4051	915	3000	150	1447	2262

(b) Emerging market economies

	CN	MY	TH	IN	ID	MX	BR	RU	CL	AR
Log EDF	0.11	0.05	0.12	0.14	0.22	0.12	0.14	0.15	0.08	0.10
	(0.01)***	(0.02)***	(0.01)***	(0.01)***	(0.05)***	(0.01)***	(0.01)***	(0.02)***	(0.01)***	(0.02)***
Sub in home country	-0.12	0.08	-0.21	-0.01	-0.82	0.06	0.02	-0.07	-0.03	0.03
	(0.04)***	(0.05)*	(0.03)***	(0.02)	(0.18)***	(0.02)***	(0.03)	(0.05)	(0.05)	(0.05)
Sub in foreign country	-0.62	-0.41		0.03		-0.04	-0.14	-0.83	0.26	0.00
	(0.11)***	(0.06)***		(0.05)		(0.03)	(0.05)***	(0.08)***	(0.05)***	(.)
Log duration	0.23	0.20	0.20	0.23	0.05	0.26	0.25	0.26	0.26	0.00
	(0.02)***	(0.02)***	(0.02)***	(0.02)***	(0.04)	(0.01)***	(0.02)***	(0.02)***	(0.02)***	(0.04)
Log coupon	0.25	0.19	-0.02	0.09	0.18	0.28	0.40	0.03	0.92	-0.02
	(0.04)***	(0.05)***	(0.06)	(0.04)**	(0.14)	(0.03)***	(0.04)***	(0.04)	(0.06)***	(0.05)
Log age	-0.07	0.06	0.06	0.01	-0.01	-0.02	-0.02	-0.02	-0.05	0.04
	(0.01)***	(0.02)***	(0.02)***	(0.01)	(0.03)	(0.01)**	(0.01)***	(0.01)**	(0.01)***	(0.02)**
Callable	-0.12	0.06	-0.20	0.02	0.61	0.01	-0.07	0.01	0.05	-0.09
	(0.04)***	(0.02)***	(0.03)***	(0.03)	(0.16)***	(0.02)	(0.02)***	(0.03)	(0.06)	(0.04)**
Log amt out (USD)	-0.04	-0.08	0.04	-0.15	0.14	0.05	-0.05	-0.20	0.04	-0.02
	(0.02)***	(0.03)**	(0.05)	(0.03)***	(0.12)	(0.01)***	(0.01)***	(0.04)***	(0.04)	(0.02)
W/in adj. R-sqr.	0.34	0.20	0.37	0.31	0.30	0.30	0.34	0.30	0.37	0.12
N. of obs	4995	2792	2054	6297	455	12094	11468	5222	2925	1740
N. of clusters	770	509	279	715	136	1159	1051	405	429	162

Table 2: Bond return predictability. This table reports the Hodrick (1992) t-statistics from the regression of annualized excess holding period returns on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. All regression include 2 digit SIC industry and rating fixed effects.

(a) 1 month holding period returns

	(1)	(2)	(3)
Default-adjusted spread	50.29	26.43	26.80
Predicted spread	27.68	21.20	21.52
Date FE		✓	✓
Country FE		✓	✓
Country-Date FE		✓	✓
Currency FE			✓
Currency-Date FE			✓
Adj. R^2	0.03	0.01	0.01
N. of obs	1108179	1108077	1108077

(b) Longer horizon holding period returns

	1M	3M	6M	12M
Default-adjusted spread	26.80	29.76	31.94	28.69
Predicted spread	21.52	23.33	20.48	18.69
Date FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Country-Date FE	✓	✓	✓	✓
Currency FE	✓	✓	✓	✓
Currency-Date FE	✓	✓	✓	✓
Adj. R^2	0.01	0.03	0.06	0.12
N. of obs	1108077	1062412	996390	876093

Table 3: Non-linearities in bond return predictability. This table reports the Hodrick (1992) t-statistics from the regression of annualized 1 month excess holding period returns on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. All regression include 2 digit SIC industry and rating fixed effects. "VIX p-value" is the p-value of the joint test of the coefficients on the three powers of VIX equal to 0. "VIX non-linear" is the p-value of the joint test of the coefficients on VIX^2 and VIX^3 equal to 0. "U. S. credit spread p-value" is the p-value of the joint test of the coefficients on the three powers of the U. S. credit spread equal to 0. "U. S. credit spread non-linear" is the p-value of the joint test of the coefficients on U. S. credit spread^2 and U. S. credit spread^3 equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spread all equal to 0.

(a) Advanced economies

	US				KR				JP				CA				GB			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
VIX	36.05	36.50		27.99	-2.62	5.78		5.72	3.89	1.35		0.37	1.57	3.43		4.76	10.24	16.31		13.17
VIX^2		-33.98		-30.71		-6.08		-6.38		2.46		3.06		-3.30		-6.36		-15.84		-14.57
VIX^3		34.91		33.30		5.94		6.29		-5.24		-5.67		3.29		6.70		16.02		15.30
U.S. credit spread			79.09	81.15			4.91	4.67			12.32	10.94			23.57	22.53			23.93	23.14
U.S. credit spread^2			-58.77	-61.22			-4.09	-3.47			-11.59	-12.82			-19.68	-18.24			-19.33	-18.33
U.S. credit spread^3			47.18	50.52			3.46	3.16			10.86	14.04			17.78	17.01			16.17	15.84
Bond default adjusted	36.73	37.06	29.60	29.34	7.48	7.60	6.16	6.01	3.02	2.85	2.12	2.04	13.39	13.23	9.24	9.39	17.53	17.97	11.36	11.47
Bond predicted	23.15	23.76	15.63	15.61	8.22	8.30	7.23	7.37	7.86	6.45	5.90	5.44	9.16	9.20	5.29	5.17	4.08	4.35	1.01	0.88
VIX p-value		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
VIX non-linear		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
U.S. CS p-value			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00
U.S. CS non-linear			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00
p-value				0.00				0.00				0.00				0.00				0.00
Adj. R^2	0.04	0.05	0.07	0.08	0.09	0.10	0.10	0.11	0.01	0.03	0.02	0.03	0.02	0.02	0.04	0.04	0.03	0.04	0.06	0.06
N. obs	675808	675808	675808	675808	10515	10515	10515	10515	70715	70715	70715	70715	86700	86700	86700	86700	84593	84593	84593	84593

	NL				FR				AU				DE				All			
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
VIX	2.40	6.78		5.58	4.64	14.66		10.94	-5.03	5.61		5.58	1.83	15.19		13.20	32.15	43.79		32.09
VIX^2		-6.74		-6.20		-14.45		-12.34		-6.38		-6.43		-15.01		-14.30		-40.37		-34.48
VIX^3		6.76		6.38		14.42		12.80		6.51		6.66		14.80		14.41		39.38		35.50
U.S. credit spread			6.92	6.49			14.99	14.27			6.39	6.07			12.85	12.44			91.28	90.37
U.S. credit spread^2			-5.55	-4.92			-11.42	-10.26			-6.58	-5.91			-9.85	-9.07			-72.11	-71.81
U.S. credit spread^3			4.53	4.20			8.81	8.13			6.35	6.02			7.58	7.38			59.37	61.07
Bond default adjusted	7.92	8.37	5.57	5.54	10.08	10.04	7.45	7.65	10.99	11.22	7.68	7.59	10.57	12.10	7.47	8.84	44.23	44.65	35.43	35.35
Bond predicted	2.41	2.26	1.38	1.19	11.11	10.86	7.53	7.30	5.00	5.02	4.68	4.87	7.93	7.89	4.03	3.39	28.80	29.15	19.62	19.61
VIX p-value		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
VIX non-linear		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
U.S. CS p-value			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00
U.S. CS non-linear			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00
p-value				0.00				0.00				0.00				0.00				0.00
Adj. R^2	0.04	0.04	0.05	0.06	0.03	0.03	0.05	0.05	0.03	0.03	0.03	0.04	0.02	0.03	0.04	0.04	0.03	0.04	0.06	0.06
N. obs	11642	11642	11642	11642	56819	56819	56819	56819	13185	13185	13185	13185	51096	51096	51096	51096	1061073	1061073	1061073	1061073

(b) Emerging market economies

	CN				MY				TH				IN				MX			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
VIX	3.33	-0.79		0.29	-0.69	4.88		2.30	-0.41	2.19		0.09	-2.62	0.54		0.75	1.72	4.51		2.97
VIX^2		0.95		-1.50		-5.16		-3.04		-2.44		-0.78		-0.15		-0.59		-3.98		-3.08
VIX^3		-0.78		3.45		5.22		3.25		2.59		1.13		-0.31		0.10		3.70		3.03
U.S. credit spread			-5.19	-11.40			5.73	5.54			2.07	2.59			3.52	1.42			7.41	7.05
U.S. credit spread^2			5.47	11.68			-5.27	-4.91			-1.67	-2.07			-2.65	-0.70			-5.10	-4.75
U.S. credit spread^3			-5.23	-11.63			4.65	4.37			1.37	1.73			1.67	0.29			3.71	3.57
Bond default adjusted	2.92	2.86	2.31	2.25	7.42	7.53	5.36	5.22	7.68	7.76	5.98	6.02	5.37	5.30	6.16	5.57	6.32	6.22	5.03	4.99
Bond predicted	0.02	0.11	-0.71	-0.89	-1.60	-1.32	-1.28	-1.06	2.74	3.00	3.06	3.76	7.02	6.83	4.54	3.72	5.05	5.08	3.66	3.68
VIX p-value		0.01		0.00		0.00		0.00		0.06		0.06		0.00		0.00		0.00		0.02
VIX non-linear		0.29		0.00		0.00		0.00		0.02		0.05		0.00		0.00		0.00		0.01
U.S. CS p-value			0.00	0.00			0.00	0.00			0.04	0.02			0.00	0.00			0.00	0.00
U.S. CS non-linear			0.00	0.00			0.00	0.00			0.02	0.01			0.00	0.07			0.00	0.00
p-value				0.00				0.00				0.01				0.00				0.00
Adj. R^2	0.03	0.03	0.06	0.08	0.12	0.13	0.15	0.16	0.09	0.09	0.10	0.10	0.08	0.09	0.09	0.10	0.04	0.05	0.07	0.07
N. obs	4774	4774	4774	4774	2647	2647	2647	2647	1983	1983	1983	1983	6016	6016	6016	6016	11507	11507	11507	11507

	BR				RU				CL				AR				All			
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
VIX	5.06	0.30		0.34	1.56	8.38		5.14	1.42	-0.25		-1.84	-2.61	1.23		1.73	2.51	4.61		3.79
VIX^2		0.04		-0.50		-7.85		-4.85		0.70		2.01		-0.57		-1.39		-3.59		-3.99
VIX^3		0.25		0.88		7.37		4.87		-1.00		-2.17		-0.25		0.68		3.04		3.75
U.S. credit spread			5.16	5.63			2.58	2.47			2.07	1.47			2.12	2.59			15.20	14.60
U.S. credit spread^2			-3.59	-4.12			-2.06	-2.23			-1.05	-0.60			-2.73	.			-10.98	-10.26
U.S. credit spread^3			3.01	3.42			1.51	1.85			0.36	0.04			.	.			8.76	8.34
Bond default adjusted	7.93	7.95	6.97	6.95	5.24	6.01	6.02	6.33	5.51	5.88	5.46	5.53	5.21	5.37	4.51	5.22	10.63	14.37	12.41	12.31
Bond predicted	4.51	4.47	4.17	4.09	8.55	9.07	6.37	7.20	1.78	1.54	2.04	2.00	2.18	1.41	2.27	1.74	7.00	9.51	7.83	7.76
VIX p-value		0.00		0.06		0.00		0.00		0.02		0.12		0.00		0.00		0.00		0.00
VIX non-linear		0.16		0.04		0.00		0.00		0.02		0.06		0.00		0.00		0.00		0.00
U.S. CS p-value			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.01			0.00	0.00
U.S. CS non-linear			0.00	0.00			0.00	0.00			0.00	0.00			0.01	.			0.00	0.00
p-value				0.00				0.00				0.00				0.00				0.00
Adj. R^2	0.07	0.07	0.08	0.08	0.13	0.14	0.14	0.15	0.13	0.13	0.15	0.15	0.08	0.11	0.08	0.11	0.07	0.06	0.08	0.08
N. obs	10814	10814	10814	10814	5026	5026	5026	5026	2774	2774	2774	2774	1565	1565	1565	1565	23739	47106	47106	47106

Table 4: Non-linearities in bond return predictability: Local vs global factors. This table reports the Hodrick (1992) t-statistics from the regression of annualized 1 month excess holding period returns on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. All regression include 2 digit SIC industry and rating fixed effects. "Global p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spread all equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX, the three powers of the U. S. credit spread, and the three powers of the local credit spread all equal to 0.

(a) Advanced economies

	KR		JP		CA		GB		NL		FR		AU		DE		All	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
VIX	5.72	5.42	0.37	2.00	4.76	5.37	13.17	8.64	5.58	6.33	10.94	14.02	5.58	3.31	13.20	19.52	18.60	18.79
VIX^2	-6.38	-5.85	3.06	1.84	-6.36	-6.81	-14.57	-11.36	-6.20	-7.05	-12.34	-16.62	-6.43	-4.20	-14.30	-21.67	-19.56	-20.24
VIX^3	6.29	5.80	-5.67	-4.72	6.70	7.12	15.30	13.10	6.38	7.22	12.80	18.32	6.66	4.13	14.41	22.51	18.92	19.76
U.S. credit spread	4.67	10.13	10.94	3.46	22.53	22.51	23.14	-2.12	6.49	-1.33	14.27	7.21	6.07	-4.76	12.44	4.46	42.12	25.89
U.S. credit spread^2	-3.47	-8.35	-12.82	-6.33	-18.24	-21.33	-18.33	-0.37	-4.92	1.81	-10.26	-7.36	-5.91	2.78	-9.07	-11.01	-35.79	-26.08
U.S. credit spread^3	3.16	6.63	14.04	6.77	17.01	21.67	15.84	2.85	4.20	-2.12	8.13	8.06	6.02	-0.03	7.38	14.73	32.41	25.50
Local credit spread		-8.65		5.71		-9.29		19.35		7.66		-0.50		7.66		4.67		23.47
Local credit spread^2		8.66		-3.03		11.54		-12.61		-6.74		3.05		-3.72		5.01		-17.81
Local credit spread^3		-7.20		2.26		-13.31		6.54		6.72		-5.31		0.75		-11.50		13.75
Bond default adjusted	6.01	5.11	2.04	0.79	9.39	8.96	11.47	7.77	5.54	3.86	7.65	6.82	7.59	4.18	8.84	5.05	19.29	17.58
Bond predicted	7.37	7.53	5.44	5.61	5.17	5.05	0.88	2.71	1.19	1.90	7.30	6.50	4.87	2.43	3.39	4.23	11.66	11.44
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Adj. R^2	0.11	0.13	0.03	0.04	0.04	0.05	0.06	0.08	0.06	0.09	0.05	0.06	0.04	0.10	0.04	0.08	0.04	0.04
N. obs	10515	10515	70715	70715	86700	86700	84593	84593	11642	11642	56819	56819	13185	13185	51096	51096	385265	385265

(b) Emerging market economies

	CN		MY		TH		IN		MX		BR		RU		CL		AR		All	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
VIX	0.29	0.33	2.30	-0.11	0.09	-0.37	0.75	-1.27	2.97	0.51	0.34	0.24	5.14	5.62	-1.84	1.47	1.73	1.58	3.79	2.40
VIX^2	-1.50	-1.51	-3.04	-0.99	-0.78	-0.47	-0.59	0.58	-3.08	-2.16	-0.50	-0.69	-4.85	-5.47	2.01	-1.01	-1.39	-1.54	-3.99	-3.30
VIX^3	3.45	3.33	3.25	1.45	1.13	0.99	0.10	-0.71	3.03	2.61	0.88	1.18	4.87	5.71	-2.17	0.62	0.68	0.87	3.75	3.31
U.S. credit spread	-11.40	-12.69	5.54	-2.19	2.59	2.17	1.42	-0.11	7.05	7.53	5.63	3.18	2.47	0.76	1.47	-1.84	2.59	3.46	14.60	10.66
U.S. credit spread^2	11.68	12.60	-4.91	2.18	-2.07	-2.04	-0.70	-0.01	-4.75	-5.38	-4.12	-2.67	-2.23	-0.03	-0.60	1.20	.	.	-10.26	-8.17
U.S. credit spread^3	-11.63	-12.27	4.37	-2.49	1.73	1.93	0.29	0.06	3.57	3.82	3.42	2.44	1.85	-1.51	0.04	-1.07	.	.	8.34	6.93
Local credit spread		2.06		9.82		-0.10		7.28		2.28		6.97		2.28		2.94		3.83		11.57
Local credit spread^2		-1.84		-7.36		1.06		-5.11		-1.00		-5.48		-1.95		-1.86		.		-7.86
Local credit spread^3		1.67		6.08		-1.20		4.66		0.98		4.58		3.45		1.63		.		5.70
Bond default adjusted	2.25	2.08	5.22	4.52	6.02	4.42	5.57	4.62	4.99	4.54	6.95	6.51	6.33	1.57	5.53	5.33	5.22	3.51	12.31	10.36
Bond predicted	-0.89	-0.69	-1.06	-0.23	3.76	2.16	3.72	2.96	3.68	3.52	4.09	3.03	7.20	4.65	2.00	2.44	1.74	1.11	7.76	5.43
Global p-value	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Adj. R^2	0.08	0.08	0.16	0.23	0.10	0.11	0.10	0.13	0.07	0.09	0.08	0.09	0.15	0.18	0.15	0.19	0.11	0.12	0.08	0.09
N. obs	4774	4774	2647	2647	1983	1983	6016	6016	11507	11507	10814	10814	5026	5026	2774	2774	1565	1565	47106	47106

Table 5: Non-linearities in bond return predictability across horizons. This table reports the Hodrick (1992) t-statistics from the regression of annualized excess holding period returns across horizons on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. "All" column in the advanced economies panel excludes the U. S. All regression include 2 digit SIC industry and rating fixed effects. "Global p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spread all equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX, the three powers of the U. S. credit spread, and the three powers of the local credit spread all equal to 0.

(a) Advanced economies

		US			KR			JP			CA			GB	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	23.28	38.55	36.13	2.38	3.92	2.60	11.46	10.99	16.44	-1.16	5.74	11.29	11.48	15.09	15.71
VIX^2	-24.32	-40.69	-34.80	-2.60	-4.19	-2.26	-9.54	-9.56	-16.30	0.53	-7.67	-13.76	-13.60	-18.22	-17.89
VIX^3	28.11	43.86	34.97	3.11	4.74	2.46	7.94	9.04	16.12	0.57	8.98	14.89	15.61	20.20	18.95
U.S. credit spread	91.74	86.65	92.87	10.63	12.21	11.88	7.94	2.44	0.55	25.53	17.63	15.94	-11.86	-19.24	-20.04
U.S. credit spread^2	-69.53	-65.62	-75.95	-8.93	-10.92	-11.00	-14.29	-7.99	-4.97	-23.25	-15.00	-13.20	9.57	15.41	15.97
U.S. credit spread^3	57.11	56.49	68.30	7.24	10.09	10.66	18.97	13.06	8.36	21.06	13.46	12.02	-7.05	-10.82	-11.08
Local credit spread				-8.75	-8.13	-6.97	9.73	10.44	10.62	-6.50	0.95	7.54	30.05	34.26	39.24
Local credit spread^2				8.26	8.84	7.53	-6.06	-7.09	-6.87	8.16	-0.49	-7.12	-25.44	-27.54	-33.07
Local credit spread^3				-7.46	-8.44	-7.25	3.47	3.65	3.93	-9.45	0.03	5.97	20.42	20.81	25.93
Bond default adjusted	32.26	33.61	33.58	7.37	7.23	7.50	3.26	3.01	6.45	10.43	12.92	12.77	7.70	11.35	16.44
Bond predicted	17.10	16.37	15.64	8.49	8.38	7.41	7.81	7.08	7.29	6.99	6.87	6.46	3.64	5.76	4.81
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.17	0.25	0.36	0.25	0.33	0.41	0.10	0.11	0.16	0.11	0.17	0.28	0.19	0.29	0.46
N. obs	649279	611204	539493	9967	9174	7700	67527	62691	54091	83742	79796	72956	81199	76180	67271

		NL			FR			AU			DE			All	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	7.06	7.02	6.46	13.30	9.18	2.80	5.42	7.08	8.91	16.30	13.92	9.39	25.91	29.19	31.51
VIX^2	-7.41	-7.33	-6.48	-14.77	-10.92	-2.95	-6.46	-7.65	-8.64	-17.76	-16.27	-11.19	-27.28	-31.81	-34.47
VIX^3	7.84	7.47	6.37	16.12	12.11	3.16	6.97	7.82	8.56	18.88	17.41	11.63	28.77	33.63	35.56
U.S. credit spread	-0.98	-3.01	-4.96	-1.03	-9.30	-13.00	-3.49	-8.38	-7.45	-7.58	-18.26	-21.66	43.40	25.06	23.13
U.S. credit spread^2	0.17	2.46	4.80	1.88	9.87	14.39	0.99	6.34	5.63	2.48	14.44	18.50	-45.91	-25.40	-23.05
U.S. credit spread^3	0.34	-2.11	-4.65	-1.99	-8.90	-13.74	1.21	-4.91	-4.56	2.90	-10.44	-15.95	47.27	25.30	23.22
Local credit spread	7.14	6.70	8.96	12.26	17.43	23.38	11.51	13.10	17.36	18.80	25.33	29.34	19.36	21.84	26.07
Local credit spread^2	-5.56	-4.86	-7.27	-11.68	-16.49	-23.29	-7.68	-8.98	-13.78	-14.17	-20.77	-24.39	-14.62	-17.10	-21.85
Local credit spread^3	5.29	4.42	6.79	10.35	14.50	21.88	4.36	5.47	11.56	10.78	17.59	21.58	11.40	13.59	17.31
Bond default adjusted	4.68	4.83	6.53	6.24	6.96	6.98	3.35	4.89	7.97	2.69	4.87	7.64	19.23	21.99	22.96
Bond predicted	3.18	2.91	3.47	9.14	8.89	6.29	1.43	1.40	0.61	6.86	6.63	3.38	12.22	11.09	9.65
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.18	0.27	0.44	0.14	0.20	0.31	0.22	0.36	0.53	0.15	0.24	0.38	0.11	0.15	0.25
N. obs	10981	10067	8630	53648	48996	41615	12665	11817	10341	48175	43824	36600	367905	342545	299205

(b) Emerging market economies

		CN			MY			TH			IN			MX	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	0.84	4.23	0.31	1.10	2.56	3.11	-2.85	-2.10	-3.74	-1.62	-0.21	-1.28	-2.70	1.39	-3.30
VIX^2	-2.35	-5.35	0.32	-1.82	-3.38	-3.56	2.12	0.91	3.08	1.44	-0.67	0.83	2.26	-2.60	3.07
VIX^3	4.83	6.23	-0.81	2.25	3.72	3.76	-1.48	-0.18	-2.45	-1.20	1.29	-0.19	-1.82	3.26	-2.81
U.S. credit spread	-14.36	-3.96	5.80	-3.96	-4.27	-3.37	3.13	3.70	4.88	0.49	0.38	5.74	8.21	11.45	10.43
U.S. credit spread^2	14.30	4.68	-4.80	3.47	3.74	3.13	-2.90	-3.43	-4.79	-0.27	-0.61	-6.13	-5.06	-8.72	-8.23
U.S. credit spread^3	-13.78	-4.75	4.15	-3.52	-3.61	-2.95	2.63	3.27	4.74	-0.10	0.74	6.10	2.86	7.39	7.23
Local credit spread	-1.27	-1.52	1.76	8.72	9.04	9.32	0.09	1.90	1.72	5.26	7.70	7.23	4.27	2.04	3.90
Local credit spread^2	1.36	1.70	-1.50	-6.52	-6.44	-6.98	0.62	-0.73	-0.33	-3.35	-5.48	-4.99	-4.17	-1.50	-3.42
Local credit spread^3	-1.39	-1.67	1.64	5.64	5.27	5.72	-0.51	0.79	0.14	2.87	4.76	4.10	4.40	1.67	3.32
Bond default adjusted	2.05	1.77	2.96	4.46	5.95	7.71	4.37	4.01	3.95	2.43	3.14	3.01	5.47	5.79	7.77
Bond predicted	-2.26	-3.16	-0.06	0.31	0.86	1.80	1.93	2.39	1.88	3.93	3.88	3.58	2.69	2.32	2.49
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.01	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.21	0.28	0.46	0.44	0.59	0.71	0.26	0.38	0.58	0.25	0.40	0.52	0.17	0.25	0.35
N. obs	4536	4161	3376	2589	2478	2271	1907	1799	1581	5779	5442	4764	11063	10460	9327

		BR			RU			CL			AR			All	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	-2.77	3.19	0.85	7.04	6.78	1.98	-0.63	2.84	2.92	2.30	3.12	2.50	0.20	6.88	1.55
VIX^2	2.95	-2.59	-0.04	-6.91	-6.23	-1.04	1.34	-2.18	-2.11	-2.78	-3.15	-2.25	-0.63	-7.43	-1.04
VIX^3	-2.33	2.66	-0.27	7.24	6.41	0.76	-1.56	1.90	1.80	2.63	3.28	2.18	1.27	8.13	1.00
U.S. credit spread	3.93	6.94	11.41	2.53	4.50	2.42	-0.22	-0.78	-1.37	2.54	1.81	2.62	13.51	16.61	17.56
U.S. credit spread^2	-2.81	-5.91	-8.85	-1.98	-4.59	-2.73	-0.18	0.02	1.02	.	.	.	-9.42	-13.04	-14.49
U.S. credit spread^3	1.86	5.36	7.50	0.58	3.28	2.23	0.15	0.18	-0.86	.	.	.	7.10	11.72	13.19
Local credit spread	12.07	5.66	-3.48	0.08	0.27	1.02	-0.47	0.20	4.57	2.62	1.49	1.01	8.60	10.02	9.54
Local credit spread^2	-11.21	-4.93	3.91	0.56	0.80	0.15	1.52	1.16	-3.19	.	.	.	-5.84	-7.34	-7.58
Local credit spread^3	10.76	4.92	-4.07	0.31	-0.34	-0.44	-1.97	-1.75	2.35	.	.	.	4.54	6.36	6.54
Bond default adjusted	5.43	5.08	6.55	2.14	2.81	3.76	5.92	7.66	5.22	7.47	5.18	4.63	9.18	10.35	13.10
Bond predicted	2.80	3.00	2.29	5.36	6.11	6.76	3.84	4.62	5.72	-0.19	0.71	0.45	5.83	5.23	6.34
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.21	0.37	0.53	0.33	0.51	0.60	0.41	0.57	0.66	0.26	0.35	0.54	0.20	0.31	0.43
N. obs	10378	9744	8453	4891	4641	4153	2692	2553	2290	1490	1463	1290	45326	42741	37507

Table 6: Non-linearities in bond return predictability: Pre-crisis vs post-crisis, pre-pandemic. This table reports the Hodrick (1992) t-statistics from the regression of annualized 1 month excess holding period returns on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. "Pre-crisis" defined as January 1998 – July 2007. "Post-crisis, pre-pandemic" defined as January 2010 – December 2019. All regression include 2 digit SIC industry and rating fixed effects. "Global p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spread all equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX, the three powers of the U. S. credit spread, and the three powers of the local credit spread all equal to 0.

(a) Advanced economies

	US		KR		JP		CA		GB		NL		FR		AU		DE		All	
	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19
VIX	35.44	-36.56	4.81	-5.58	22.67	4.14	3.07	4.90	15.66	2.23	8.02	2.80	6.44	17.13	2.96	6.98	6.64	8.32	31.55	16.56
VIX^2	-32.42	32.59	-4.80	4.80	-20.04	-4.16	-0.26	-6.94	-13.99	-1.91	-7.61	-2.71	-5.23	-17.33	-0.85	-7.09	-4.24	-7.65	-26.65	-18.13
VIX^3	28.95	-31.80	4.64	-4.66	19.22	4.57	-1.43	7.44	13.20	0.58	7.27	2.49	4.99	17.14	-0.15	6.99	2.71	6.57	24.18	18.53
U.S. credit spread	30.23	36.85	-1.11	0.63	4.83	22.65	12.52	8.98	22.22	16.30	3.09	-0.43	0.85	27.04	5.94	-6.10	2.63	0.29	36.21	22.09
U.S. credit spread^2	-18.86	-29.17	0.99	0.40	2.08	-20.33	-9.10	-7.80	-17.64	-15.42	-1.27	0.78	1.55	-24.50	-5.48	5.72	0.31	2.11	-26.73	-16.86
U.S. credit spread^3	14.40	24.84	-0.77	-1.12	-6.12	18.59	6.76	7.28	14.89	14.85	0.52	-0.94	-2.66	22.33	5.14	-5.27	-1.73	-3.68	22.05	13.47
Local credit spread			0.35	6.52	-6.58	-5.44	-8.39	-17.20	0.40	-15.05	0.35	6.10	16.30	-14.18	-0.36	5.02	14.75	12.43	-9.67	-21.90
Local credit spread^2			0.79	-6.47	1.96	4.68	5.16	17.20	-0.77	14.58	-0.96	-5.83	-15.60	10.44	-0.32	-3.48	-14.55	-14.27	3.59	21.66
Local credit spread^3			-1.46	6.43	0.37	-4.85	-2.95	-17.18	0.33	-14.13	1.34	5.70	14.38	-6.84	0.76	2.26	14.01	15.60	-1.38	-22.00
Bond default adjusted	8.95	10.61	3.95	3.39	4.18	3.91	2.58	4.48	2.43	5.56	6.14	3.12	2.08	10.30	3.97	6.01	0.49	2.01	5.95	10.05
Bond predicted	13.04	14.96	3.23	3.90	7.27	1.93	2.49	1.56	3.01	4.47	4.69	2.96	4.45	8.07	-0.77	0.53	4.97	6.97	8.87	6.11
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.24	0.12	0.36	0.13	0.22	0.09	0.28	0.07	0.22	0.09	0.21	0.08	0.28	0.11	0.17	0.10	0.25	0.09	0.22	0.07
N. obs	86769	381444	1002	5925	17830	34269	11741	49080	14217	45168	2545	5643	6590	34799	1758	7604	7207	27916	62891	210406

(b) Emerging market economies

	MY		TH		IN		MX		BR		RU		CL		AR		All	
	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19
VIX	1.05	-2.36	-1.80	-3.48	0.51	-8.20	4.50	-4.37	1.01	-11.42	-2.49	-0.53	-0.17	-7.36	1.88	-2.30	4.80	-15.97
VIX^2	-1.04	2.29	1.76	3.79	-0.59	7.96	-4.56	4.60	-0.97	10.93	2.54	0.60	0.07	7.16	-1.70	2.38	-4.67	15.40
VIX^3	1.10	-2.47	-1.72	-4.14	0.56	-8.21	4.25	-5.14	0.72	-10.85	-2.60	-1.06	0.05	-7.15	1.61	-2.61	4.32	-15.51
U.S. credit spread	-4.15	-1.85	-0.33	-2.63	0.66	3.32	-3.84	6.51	1.74	10.48	-2.42	-1.71	1.45	3.87	1.29	1.80	0.61	9.24
U.S. credit spread^2	3.97	1.93	.	2.58	.	-2.85	3.69	-5.36	.	-10.02	2.93	1.72	.	-4.23	.	.	0.31	-7.92
U.S. credit spread^3	-3.97	-1.99	.	-2.56	.	2.63	-3.27	4.49	.	9.77	-3.38	-1.47	.	4.57	.	.	-0.60	7.27
Local credit spread	7.44	1.19	0.48	6.32	-1.93	3.88	9.52	-2.71	2.77	-4.43	-1.68	1.90	0.52	-2.51	.	-0.19	6.72	3.05
Local credit spread^2	-5.46	-0.73	.	-5.83	1.92	-3.96	-8.06	1.69	.	5.05	1.90	-2.41	.	3.39	.	0.83	-5.56	-1.67
Local credit spread^3	3.74	0.44	.	5.33	.	4.09	6.92	-0.64	.	-5.63	-1.96	3.72	.	-3.95	.	.	5.67	1.22
Bond default adjusted	4.22	4.01	3.83	2.73	2.49	3.92	3.18	2.59	1.16	5.18	1.47	5.84	2.07	5.07	-2.24	2.24	1.72	7.49
Bond predicted	-0.53	1.08	2.00	2.94	-1.48	2.94	1.83	2.88	3.88	2.74	4.01	6.11	1.61	2.45	0.10	1.25	0.11	2.87
Global p-value	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.20	0.10	0.08	0.10	0.16	0.15	0.28	0.09	0.18	0.09	0.35	0.19	0.19	0.21	0.34	0.03	0.20	0.10
N. obs	606	1280	90	1159	167	3780	1081	7334	599	6878	110	4070	41	1914	175	898	2871	29774

Table 7: Post-crisis, pre-pandemic non-linearities in bond return predictability across horizons. This table reports the Hodrick (1992) t-statistics from the regression of annualized excess holding period returns across horizons on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. "Post-crisis, pre-pandemic" defined as January 2010 – December 2019. "All" column in the advanced economies panel excludes the U. S. All regression include 2 digit SIC industry and rating fixed effects. "Global p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spread all equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX, the three powers of the U. S. credit spread, and the three powers of the local credit spread all equal to 0.

(a) Advanced economies

		KR			JP			CA			GB			NL	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	-41.51	-29.79	28.45	-5.96	-3.29	1.91	-4.79	-2.37	-2.58	-13.28	-19.31	-5.49	-3.82	-7.54	4.24
VIX^2	35.45	23.88	-33.62	4.69	2.09	-3.15	2.64	-1.13	-0.61	8.25	15.34	0.51	3.55	7.30	-5.49
VIX^3	-30.49	-20.14	37.38	-4.09	-1.43	3.85	-1.36	3.74	2.42	-3.29	-11.78	2.74	-3.01	-6.66	6.45
U.S. credit spread	67.29	48.09	38.20	2.59	3.71	7.16	25.85	15.61	14.32	-4.06	10.25	19.60	8.93	8.69	13.59
U.S. credit spread^2	-56.85	-39.37	-27.51	-1.36	-2.67	-5.97	-23.22	-12.45	-11.72	7.76	-6.68	-16.46	-6.50	-5.43	-10.56
U.S. credit spread^3	50.39	35.01	20.71	0.50	2.07	5.27	21.76	10.60	10.53	-10.70	3.83	14.24	4.29	2.33	7.92
Local credit spread				3.82	1.72	-0.76	-0.81	-3.44	-10.58	8.18	-10.69	-26.95	-8.69	-10.10	-14.96
Local credit spread^2				-3.82	-1.74	0.62	0.31	1.03	6.47	-9.89	7.72	24.13	6.97	7.17	12.37
Local credit spread^3				3.81	1.75	-0.45	-1.26	-0.36	-5.18	11.09	-4.97	-21.67	-5.07	-3.66	-9.50
Bond default adjusted	13.70	12.40	11.00	2.91	3.04	3.88	5.62	5.37	7.71	7.58	7.53	9.22	6.19	7.77	9.43
Bond predicted	16.58	13.33	8.97	3.41	3.17	2.63	2.49	1.98	3.00	2.59	0.66	-1.19	5.62	6.95	4.54
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.29	0.40	0.48	0.27	0.34	0.36	0.17	0.22	0.31	0.18	0.28	0.42	0.20	0.31	0.43
N. obs	369994	355289	328041	5734	5447	4842	32994	31108	27555	48127	46983	44955	43875	42232	38940

		FR			AU			DE			All				
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	0.41	-2.03	0.98	3.81	-6.52	7.06	1.78	-2.71	4.68	-1.32	-6.68	-0.99	-8.78	-15.18	5.05
VIX^2	-0.47	2.13	-1.27	-2.96	7.37	-8.22	-1.89	3.14	-3.97	1.43	6.68	-0.16	5.78	12.03	-10.31
VIX^3	0.62	-2.20	1.60	2.91	-7.74	9.83	1.92	-3.32	3.46	-1.39	-6.74	1.00	-3.13	-9.63	14.14
U.S. credit spread	-0.24	0.35	0.85	37.12	30.53	26.01	-1.64	-3.62	-6.06	-0.28	6.21	2.38	27.42	31.26	31.20
U.S. credit spread^2	0.82	-0.03	-0.55	-33.76	-28.65	-23.81	1.15	2.92	5.35	2.95	-4.90	-2.00	-20.10	-25.58	-25.49
U.S. credit spread^3	-1.13	-0.09	0.46	30.67	27.15	22.35	-0.69	-2.40	-4.69	-5.04	3.80	1.81	14.46	21.81	22.01
Local credit spread	5.36	7.51	5.44	-33.67	-27.67	-20.34	1.05	3.97	5.47	8.87	6.05	8.45	-7.44	-7.99	-9.96
Local credit spread^2	-4.92	-7.58	-5.41	30.35	25.33	17.57	0.23	-2.89	-4.41	-9.50	-6.65	-8.02	7.09	7.30	9.01
Local credit spread^3	4.42	7.41	5.14	-27.00	-22.76	-15.34	-1.21	2.09	3.56	9.89	7.24	7.76	-7.08	-6.90	-8.83
Bond default adjusted	4.64	5.86	6.84	6.41	6.02	5.08	4.22	5.82	6.39	0.83	0.76	1.23	10.38	10.50	9.50
Bond predicted	4.94	4.56	5.25	5.83	5.98	4.73	-0.93	-1.18	-1.19	8.29	6.53	3.97	5.69	3.77	2.88
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.18	0.28	0.41	0.24	0.31	0.35	0.20	0.35	0.50	0.19	0.23	0.30	0.17	0.23	0.32
N. obs	5431	5184	4672	33404	31630	28176	7394	7102	6506	26678	25070	21844	203641	194758	177493

(b) Emerging market economies

		CN			MY			TH			IN			MX	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	-3.34	-1.60	4.52	-1.51	-1.56	-0.40	-1.09	-2.10	0.85	-7.29	-5.90	-1.49	-1.92	1.31	9.36
VIX^2	2.70	0.94	-5.21	1.55	1.74	0.46	1.10	1.69	-0.87	6.71	5.22	0.23	1.73	-1.55	-9.34
VIX^3	-2.38	-0.89	5.31	-1.63	-2.01	-0.66	-1.13	-1.46	0.88	-6.17	-4.69	0.45	-1.56	1.57	9.45
U.S. credit spread	2.69	-0.69	-1.06	-0.91	-1.29	-1.10	-1.70	-0.60	-2.25	8.15	3.42	-2.15	12.80	9.40	7.25
U.S. credit spread^2	-2.00	1.34	1.80	0.91	1.12	0.88	1.37	0.05	1.77	-7.45	-2.95	2.33	-11.19	-8.21	-6.16
U.S. credit spread^3	1.61	-1.60	-2.15	-0.94	-0.91	-0.70	-1.11	0.45	-1.49	7.00	2.79	-2.42	9.98	7.46	5.41
Local credit spread	2.49	3.78	7.36	-0.01	-0.27	0.68	7.94	5.35	6.89	1.78	1.88	4.75	-8.02	-8.85	-5.55
Local credit spread^2	-2.11	-3.24	-6.72	0.59	1.23	0.34	-7.36	-4.18	-5.72	-1.71	-0.75	-3.03	6.99	8.13	4.81
Local credit spread^3	2.01	3.17	6.71	-0.96	-1.98	-1.07	6.78	3.34	4.81	1.85	0.20	2.07	-5.94	-7.34	-4.00
Bond default adjusted	2.82	1.13	1.35	4.65	3.27	2.68	3.99	3.54	3.50	0.87	1.45	1.42	4.01	4.07	6.35
Bond predicted	0.45	-0.63	1.11	0.94	0.99	1.46	3.72	3.29	2.77	2.93	2.62	2.58	2.19	1.06	1.26
Global p-value	0.00	0.00	0.00	0.02	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.36	0.48	0.59	0.25	0.42	0.53	0.29	0.48	0.61	0.32	0.48	0.61	0.24	0.38	0.42
N. obs	2395	2287	2030	1257	1228	1167	1131	1083	991	3712	3628	3428	7141	6924	6469

		BR			RU			CL			AR			All	
	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M	3M	6M	12M
VIX	-6.02	1.07	1.37	2.86	4.64	0.86	-8.52	-4.90	5.64	-2.85	0.08	1.92	-10.61	-6.74	3.65
VIX^2	5.01	-1.69	-3.12	-3.00	-4.62	-1.49	8.21	4.72	-5.61	2.59	-0.32	-2.60	9.04	5.37	-6.53
VIX^3	-4.33	2.25	4.33	2.83	4.38	2.01	-7.84	-4.35	5.66	-2.55	0.30	2.79	-7.99	-4.54	8.58
U.S. credit spread	17.08	5.33	2.31	2.08	2.89	1.44	6.56	-0.40	-2.24	4.14	6.89	5.69	17.78	13.53	6.98
U.S. credit spread^2	-16.70	-4.39	-0.97	-1.81	-2.19	-0.79	-6.60	0.15	1.77	.	.	.	-15.81	-11.52	-4.42
U.S. credit spread^3	16.30	3.84	0.35	1.94	1.88	0.39	6.61	-0.02	-1.35	.	.	.	14.82	10.67	2.96
Local credit spread	2.00	2.34	-8.16	-0.19	0.62	0.63	-3.15	1.92	2.39	-2.92	0.33	-2.37	3.82	-1.39	0.68
Local credit spread^2	-1.73	-2.49	7.71	0.36	0.50	0.64	3.75	-1.08	-1.26	4.07	-2.48	0.91	-3.30	2.64	0.19
Local credit spread^3	1.29	2.88	-7.09	0.36	-0.41	-1.20	-4.06	0.78	0.63	.	.	.	3.55	-3.21	-0.45
Bond default adjusted	5.55	5.13	7.11	5.31	3.98	4.39	4.26	5.86	4.59	4.38	3.20	5.90	6.64	7.32	9.71
Bond predicted	1.20	2.37	1.95	5.81	4.37	5.96	2.00	2.89	3.80	2.11	2.35	2.88	2.47	2.70	3.04
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.18	0.34	0.50	0.36	0.60	0.70	0.46	0.66	0.75	0.23	0.40	0.55	0.24	0.38	0.48
N. obs	6659	6433	5904	4022	3885	3591	1886	1836	1740	859	835	751	29064	28140	26072

Table 8: Return predictability from predicted and excess credit spreads This table reports the Hodrick (1992) t-statistics from the regression of annualized 1 month excess holding period returns on default-adjusted credit spreads, predicted credit spreads, and bond characteristics. "Pre-crisis" defined as January 1998 – July 2007. "Post-crisis, pre-pandemic" defined as January 2010 – December 2019. All regression include 2 digit SIC industry and rating fixed effects."Global p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX and the three powers of the U. S. credit spreads all equal to 0. "p-value" is the p-value of the joint test of the coefficients on the three powers of the VIX, the three powers of the U. S. credit spreads, and the three powers of the local credit spreads all equal to 0.

(a) Advanced economies

	US		KR		JP		CA		GB		NL		FR		AU		DE		All	
	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19
VIX	35.57	-24.23	3.06	-3.01	24.80	11.63	11.23	5.59	19.73	-0.52	7.80	3.26	9.24	23.32	2.13	6.33	3.65	12.26	35.43	25.12
VIX^2	-36.76	20.38	-2.79	2.59	-23.69	-9.83	-8.90	-6.29	-16.81	0.52	-7.44	-3.31	-7.22	-22.79	-0.38	-6.17	-1.27	-10.85	-31.92	-25.12
VIX^3	35.72	-20.95	2.62	-2.73	23.23	9.41	6.53	6.05	15.35	-1.57	7.10	3.18	6.48	22.30	-0.36	5.88	0.00	9.24	29.67	24.47
U.S. def. adj. spread	24.13	89.60	-0.53	4.49	56.41	26.29	16.87	-20.81	16.27	17.14	8.95	-0.49	8.40	18.17	2.96	-4.30	7.68	-8.64	34.16	27.11
U.S. def. adj. spread^2	-34.16	-22.77	2.89	1.16	6.94	-10.45	-11.37	20.59	3.03	24.26	1.43	5.67	-6.47	-10.15	0.73	7.56	-2.54	9.11	-21.62	0.47
U.S. def. adj. spread^3	8.83	13.52	-0.53	-2.37	-27.86	10.67	-14.70	-14.55	-5.08	-14.97	-6.07	-5.16	-3.96	2.94	-0.74	-2.13	1.38	-9.97	-5.04	-8.79
U.S. predicted	1.92	28.27	-0.18	0.33	2.77	4.24	-10.55	15.88	5.76	6.76	2.07	2.09	-3.75	10.10	-1.32	0.16	0.33	5.04	-2.33	34.12
U.S. predicted^2	-0.61	-27.03	0.14	-0.19	-2.10	-2.78	11.00	-15.85	-5.47	-6.42	-1.76	-2.27	4.27	-10.32	1.62	-0.28	0.09	-5.53	4.00	-32.65
U.S. predicted^3	-0.35	26.45	-0.11	0.12	1.50	1.35	-11.31	15.92	5.20	6.22	1.48	2.48	-4.70	10.44	-1.90	0.37	-0.45	5.95	-5.42	31.38
Local def. adj. spread			2.92	-0.08	-27.52	-37.34	-20.78	34.32	7.21	-13.88	-2.39	2.36	-4.93	-9.89	-4.90	6.85	-5.18	7.55	-27.91	1.00
Local def. adj. spread^2			-3.48	7.43	-5.01	-8.07	14.41	-18.28	7.61	-20.25	-0.33	-4.42	-0.76	17.66	1.69	-10.11	6.01	10.06	13.03	8.65
Local def. adj. spread^3			-3.33	-1.94	11.70	12.72	16.73	8.40	6.72	12.38	2.96	8.83	-1.25	-7.92	0.74	-2.89	8.11	9.12	9.35	-14.09
Local predicted			0.89	5.19	9.67	-19.17	-7.76	15.40	11.72	-19.29	3.75	-3.10	10.83	-3.85	0.10	-5.48	4.14	-2.95	0.47	23.58
Local predicted^2			-0.42	-4.76	-9.71	20.88	7.64	-16.29	-11.10	18.53	-3.65	3.40	-10.91	4.41	-0.32	5.91	-3.75	3.26	-3.07	-22.14
Local predicted^3			0.07	4.30	9.68	-22.62	-7.51	17.12	10.42	-17.73	3.55	-3.66	10.59	-4.91	0.50	-6.33	3.30	-3.37	4.28	20.84
Bond default adjusted	9.51	12.78	3.67	3.40	5.61	7.25	2.49	4.53	4.77	6.14	7.15	3.28	4.13	10.59	3.16	5.64	3.58	7.96	6.95	11.63
Bond predicted	10.63	11.98	0.95	3.04	4.67	0.22	1.71	1.05	1.28	2.52	4.67	3.21	3.11	8.09	-0.18	1.28	1.89	2.97	6.18	4.73
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p-value			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.30	0.11	0.40	0.17	0.30	0.17	0.31	0.11	0.27	0.11	0.26	0.12	0.34	0.11	0.21	0.12	0.29	0.14	0.26	0.07
N. obs	86769	381444	1002	5925	17830	34269	11741	49080	14217	45168	2545	5643	6590	34799	1758	7604	7207	27916	62891	210406

(b) Emerging market economies

	MY		TH		IN		MX		BR		RU		CL		AR		All	
	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19	98–07	10–19
VIX	0.76	0.44	-4.03	-3.90	1.43	-5.64	5.57	-4.51	-1.52	-12.11	-3.37	-0.39	-0.34	-5.93	2.18	-0.69	4.37	-13.67
VIX^2	-0.79	-0.47	4.34	4.24	-1.68	5.43	-5.63	4.86	1.29	11.46	3.44	0.42	0.23	5.84	-2.05	0.77	-4.59	13.08
VIX^3	0.95	0.27	-4.63	-4.68	1.60	-5.51	5.39	-5.53	-1.21	-11.06	-3.53	-0.84	-0.09	-5.83	2.02	-1.01	4.57	-13.32
U.S. def. adj. spread	-0.77	-0.56	-5.33	0.86	2.07	3.33	4.73	1.34	2.15	-7.05	-3.38	5.64	-0.31	-2.27	2.81	1.17	2.56	11.84
U.S. def. adj. spread^2	0.36	1.99	-5.45	1.12	1.31	-2.64	0.91	-1.31	1.32	-8.36	-3.36	-0.44	-0.74	-1.14	0.26	-2.95	-4.06	-8.67
U.S. def. adj. spread^3	-1.12	-2.31	-5.34	-1.82	-1.24	1.87	-1.23	0.33	-2.24	9.58	-3.22	0.98	-1.12	-2.27	-3.14	3.19	0.06	6.73
U.S. predicted	1.28	3.28	-3.29	1.75	.	1.94	4.30	0.13	0.00	-2.05	-3.63	-0.65	.	1.87	-0.66	.	-0.90	9.74
U.S. predicted^2	-1.30	-3.31	3.27	-1.78	4.40	-1.86	-4.31	-0.13	-0.11	2.08	3.57	0.55	-3.05	-1.91	0.70	-5.21	1.01	-9.52
U.S. predicted^3	1.32	3.35	-3.25	1.79	-4.59	1.79	4.36	0.19	0.24	-2.07	-3.50	-0.41	2.91	1.96	-0.72	5.37	-1.06	9.41
Local def. adj. spread	-3.54	0.79	-1.53	1.60	0.72	-3.60	0.25	-0.52	-2.18	10.23	5.35	0.49	0.74	3.98	-2.81	5.83	1.25	5.96
Local def. adj. spread^2	-3.02	-0.37	-1.50	-0.75	0.02	0.83	-0.64	0.10	-3.07	-0.76	1.51	-0.93	0.17	-1.06	-2.47	-3.15	-2.19	-3.15
Local def. adj. spread^3	1.84	0.61	-1.52	0.61	0.01	3.41	0.85	4.43	2.77	-2.94	0.18	2.96	0.05	2.85	-2.17	-6.47	2.58	2.64
Local predicted	-1.85	-3.49	0.14	2.04	0.45	1.97	5.27	5.76	-1.75	3.33	1.54	0.39	0.57	5.62	.	0.39	5.47	5.70
Local predicted^2	1.87	3.72	-0.16	-1.61	-0.44	-1.71	-4.14	-5.75	1.93	-4.02	-1.65	-0.23	-0.29	-4.92	0.49	-0.49	-5.02	-5.15
Local predicted^3	-1.89	-3.91	0.19	1.25	0.46	1.57	2.87	5.72	-2.01	4.76	1.81	0.10	0.26	4.35	-0.60	0.41	4.52	5.61
Bond default adjusted	4.42	3.13	10.06	2.92	3.01	4.35	3.40	2.66	3.38	4.81	-0.37	5.71	-0.76	4.61	-3.05	1.97	4.00	7.02
Bond predicted	0.26	0.61	3.54	2.58	-0.53	2.19	2.28	2.92	0.22	5.48	5.60	4.89	-0.77	2.15	0.17	-0.22	0.36	2.27
Global p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.03	0.00	0.00	0.00
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
Adj. R^2	0.19	0.12	0.24	0.11	0.24	0.16	0.30	0.10	0.28	0.14	0.43	0.19	0.29	0.24	0.49	0.12	0.25	0.11
N. obs	606	1280	90	1159	167	3780	1081	7334	599	6878	110	4070	41	1914	175	898	2871	29774

Table 9: Capital flows and the global credit cycle. This table reports the estimated coefficients from the contemporaneous regression of capital flows on a constant, 3 lags of the dependent variable, the contemporaneous local real policy rate, and the contemporaneous contributions of VIX, U. S. credit spreads, and local credit spreads to risk-adjusted expected corporate bond returns. For advanced economies, the predictive regression also controls for the contemporaneous 10 year – 3 month sovereign yield slope. Lag-augmented (Montiel Olea and Plagborg-Møller, 2021) standard errors reported in parentheses below the point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) Total outflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-511.70	88.78	-617.76	-62.07	75.16	-37.57	3.00	-0.16	-0.01
	(476.64)	(339.32)	(340.36)*	(31.26)**	(27.46)***	(27.76)	(2.80)	(3.90)	(2.91)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	-99.07	-389.07	-318.42	-90.52	-79.99	-79.08	-6.32	-3.56	1.83
	(195.23)	(143.49)***	(128.45)**	(27.90)***	(22.30)***	(21.36)***	(1.96)***	(4.25)	(2.69)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-70.50	-70.06	-97.54	0.71	-2.96	-1.47
				(27.68)**	(25.88)***	(26.36)***	(0.10)***	(2.20)	(1.60)
Adj. R^2	0.10	0.11	0.18	0.22	0.25	0.11	0.46	0.40	0.32
N. obs	97	96	93	767	759	735	585	577	553

(b) Total inflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-570.92	264.33	-515.05	-67.44	71.56	-41.16	3.70	7.94	-2.63
	(505.29)	(328.91)	(399.27)	(32.56)**	(30.02)**	(25.76)	(3.42)	(4.04)**	(3.20)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	-75.57	-427.70	-294.58	-80.02	-78.60	-83.71	7.28	1.29	-1.35
	(185.32)	(138.03)***	(146.00)**	(26.44)***	(22.94)***	(20.82)***	(1.64)***	(4.40)	(2.45)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-62.33	-67.23	-100.89	-1.49	-4.77	-3.61
				(28.08)**	(26.03)***	(25.79)***	(0.11)***	(2.55)*	(1.68)**
Adj. R^2	0.15	0.13	0.14	0.20	0.25	0.11	0.59	0.49	0.35
N. obs	97	96	93	767	759	735	585	577	553

(c) Total bank outflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-538.69	195.53	-351.22	-86.62	38.87	-20.60	1.76	-2.83	0.72
	(432.57)	(261.28)	(215.51)	(27.16)***	(21.37)*	(20.08)	(1.96)	(3.08)	(2.50)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	64.16	-276.45	-210.11	-39.48	-72.50	-67.67	-5.06	-3.35	2.05
	(158.77)	(115.39)**	(87.36)**	(24.39)	(19.55)***	(17.11)***	(1.76)***	(3.92)	(2.29)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-26.63	-64.70	-84.53	1.87	-3.13	-1.18
				(23.84)	(21.51)***	(20.76)***	(0.09)***	(1.85)*	(1.43)
Adj. R^2	0.25	0.20	0.07	0.15	0.15	0.08	0.48	0.30	0.20
N. obs	97	96	93	767	759	735	585	577	553

(d) Total bank inflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-684.99	204.67	-319.78	-68.38	64.75	-25.31	-2.76	2.96	-0.27
	(480.53)	(318.47)	(263.87)	(29.22)**	(24.17)***	(19.71)	(2.45)	(2.84)	(2.43)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	74.80	-419.20	-195.85	-57.79	-66.59	-86.79	4.00	0.39	-1.48
	(164.35)	(135.79)***	(109.43)*	(25.24)**	(22.33)***	(19.30)***	(2.24)*	(3.16)	(1.87)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-40.14	-54.82	-96.12	-2.00	-3.74	-3.55
				(23.59)*	(23.17)**	(22.60)***	(1.40)	(1.90)**	(1.24)***
Adj. R^2	0.28	0.14	-0.04	0.14	0.16	0.10	0.45	0.39	0.27
N. obs	97	96	93	767	759	735	584	576	552

(e) Total debt outflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	109.80	-141.06	-309.53	12.22	15.54	-3.00	2.21	1.79	-0.62
	(106.11)	(95.25)	(105.26)***	(7.96)	(8.13)*	(7.10)	(1.36)	(1.54)	(1.07)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	-189.14	-39.94	-68.45	-27.23	-6.34	-12.53	-0.62	0.78	0.22
	(39.66)***	(50.16)	(44.36)	(6.40)***	(5.61)	(6.20)**	(0.21)***	(0.87)	(1.00)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-18.19	-7.32	-12.05	-0.07	1.00	0.06
				(5.59)***	(6.52)	(6.41)*	(0.02)***	(0.62)	(0.74)
Adj. R^2	0.36	0.26	0.30	0.16	0.15	0.08	0.06	0.05	0.02
N. obs	97	96	93	767	759	735	488	479	458

(f) Total debt inflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	328.78	144.78	-114.38	2.81	-5.39	-7.91	4.54	-0.25	-3.11
	(210.38)	(247.97)	(215.93)	(9.15)	(11.05)	(7.07)	(1.53)***	(1.51)	(1.99)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	-238.41	98.74	-108.70	-15.25	-11.80	-9.04	0.90	-0.89	-1.45
	(93.73)**	(91.88)	(91.56)	(6.59)**	(7.20)	(6.47)	(0.24)***	(1.00)	(0.94)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-10.64	-14.37	-13.71	-0.18	-1.45	-1.06
				(7.22)	(7.31)**	(5.81)**	(0.03)***	(0.70)**	(0.72)
Adj. R^2	0.20	0.03	0.01	0.16	0.23	0.10	0.26	0.19	0.11
N. obs	97	96	93	767	759	735	543	535	511

(g) Total equity outflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-148.62	-29.22	-16.25	18.08	1.58	-9.07	0.86	0.44	-1.05
	(153.11)	(95.76)	(109.61)	(4.68)***	(4.65)	(5.18)*	(0.36)**	(0.47)	(0.55)*
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	34.66	-66.92	-89.35	-17.23	-2.81	0.18	-0.07	-0.03	-0.46
	(59.03)	(50.12)	(49.49)*	(3.77)***	(3.68)	(4.20)	(0.12)	(0.31)	(0.52)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-18.34	-1.91	0.62	-0.10	0.06	-0.19
				(4.23)***	(3.96)	(3.94)	(0.01)***	(0.24)	(0.28)
Adj. R^2	0.01	0.05	0.02	0.15	0.09	0.04	0.19	0.07	0.04
N. obs	97	96	93	767	759	735	575	567	543

(h) Total equity inflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	-211.72	-172.02	-249.64	-2.28	-2.61	-4.63	3.55	1.46	-1.67
	(162.89)	(129.30)	(154.93)	(3.88)	(3.06)	(3.35)	(0.97)***	(0.89)	(0.89)*
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	29.74	-19.34	-67.75	-6.52	-0.88	0.77	0.74	0.80	-0.16
	(62.74)	(72.27)	(72.32)	(3.20)**	(3.27)	(2.87)	(0.20)***	(0.73)	(0.71)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-9.44	-1.67	-0.05	-0.11	0.41	0.19
				(3.52)***	(3.27)	(3.58)	(0.03)***	(0.54)	(0.52)
Adj. R^2	0.04	0.03	0.11	0.08	0.08	0.10	0.18	0.11	0.11
N. obs	97	96	93	767	759	735	581	573	549

(i) Total FDI outflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	59.51	86.66	-20.30	-6.18	20.43	-5.42	-1.55	0.78	0.41
	(68.58)	(85.78)	(77.36)	(5.99)	(6.39)***	(7.10)	(1.13)	(1.05)	(0.82)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	-53.63	-13.02	-18.52	-8.88	0.91	-6.05	-0.60	-0.38	-0.37
	(41.22)	(36.95)	(44.65)	(6.92)	(7.17)	(6.03)	(0.23)***	(0.86)	(0.65)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-10.90	2.48	-7.54	-0.93	-0.36	-0.60
				(7.93)	(7.66)	(6.89)	(0.09)***	(0.65)	(0.53)
Adj. R^2	0.04	0.02	-0.02	0.25	0.30	0.16	0.38	0.29	0.31
N. obs	97	96	93	767	759	735	585	577	553

(j) Total FDI inflows

	US			AE ex US			EME		
	Contemp.	1Q	1Y	Contemp.	1Q	1Y	Contemp.	1Q	1Y
$\frac{Rx\_it}{\sigma(Rx)}$ due to VIX	91.33	181.81	84.17	-1.25	14.73	-0.54	-2.33	3.54	1.55
	(58.44)	(74.80)**	(65.03)	(6.45)	(6.27)**	(5.97)	(1.90)	(1.16)***	(1.67)
$\frac{Rx\_it}{\sigma(Rx)}$ due to U.S. credit spreads	0.58	-46.51	-42.79	-1.72	2.15	2.56	-0.58	0.24	1.30
	(32.98)	(41.74)	(31.04)	(7.75)	(6.49)	(5.44)	(0.28)**	(0.86)	(0.84)
$\frac{Rx\_it}{\sigma(Rx)}$ due to local credit spreads				-5.14	4.94	0.27	-0.88	-0.51	0.02
				(9.95)	(7.05)	(6.48)	(0.04)***	(0.60)	(0.62)
Adj. R^2	0.03	0.05	0.03	0.21	0.20	0.12	0.58	0.55	0.47
N. obs	97	96	93	767	759	735	585	577	553

Table 10: Unemployment growth predictability. This table reports the estimated coefficients from the predictive regression of h-periods ahead unemployment growth on a constant, h-period lag of the dependent variable, the contemporaneous local real policy rate, and the contemporaneous contributions of VIX, U. S. credit spreads, and local credit spreads to risk-adjusted expected corporate bond returns. For advanced economies, the predictive regression also controls for the contemporaneous 10 year – 3 month sovereign yield slope. Lag-augmented (Montiel Olea and Plagborg-Møller, 2021) standard errors reported in parentheses below the point estimates. *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

(a) 3 months

	US	KR	JP	CA	GB	NL	FR	AU	DE	All AE	TH	MX	BR	RU	CL	All EM
$\frac{Rx_{it}}{\sigma(Rx)}$ due to VIX	-6.74	-0.52	0.24	-4.15	0.29	-0.32	0.12	-0.21	-0.17	-0.26	0.14	0.24	-15.94	0.23	-0.86	-0.58
	(3.64)*	(0.38)	(0.26)	(2.62)	(0.30)	(0.25)	(0.48)	(0.51)	(0.15)	(0.18)	(0.31)	(0.34)	(5.50)***	(0.55)	(1.02)	(0.31)*
$\frac{Rx_{it}}{\sigma(Rx)}$ due to U.S. credit spreads	1.60	-0.04	-0.20	-0.33	0.35	1.01	1.33	0.91	-0.01	0.28	-0.17	-0.73	-1.87	-2.66	-0.09	-1.15
	(0.82)*	(0.42)	(0.49)	(0.68)	(0.18)*	(0.84)	(0.33)***	(0.59)	(0.11)	(0.15)*	(0.49)	(0.63)	(5.67)	(0.69)***	(0.56)	(0.65)*
$\frac{Rx_{it}}{\sigma(Rx)}$ due to local credit spreads		-0.20	0.11	-0.73	0.02	-0.09	0.90	0.19	-0.05	0.09	0.64	-0.30	1.90	0.03	1.43	0.03
		(0.35)	(0.46)	(0.65)	(0.12)	(0.14)	(0.23)***	(0.40)	(0.08)	(0.10)	(0.48)	(0.40)	(1.03)*	(0.01)**	(0.55)**	(0.02)*
Adj. R^2	0.15	0.13	0.24	0.15	0.23	0.17	0.15	0.15	0.27	0.09	0.19	0.29	0.22	0.12	0.19	0.07
N. obs	291	268	297	285	267	284	237	99	189	1827	107	85	112	144	208	770

(b) 1 year

	US	KR	JP	CA	GB	NL	FR	AU	DE	All AE	TH	MX	BR	RU	CL	All EM
$\frac{Rx_{it}}{\sigma(Rx)}$ due to VIX	-7.28	-0.42	0.38	-1.80	-0.13	-1.08	-0.41	0.60	-0.12	-0.34	0.47	0.01	-11.10	-0.47	-1.17	-0.32
	(2.88)**	(0.28)	(0.37)	(1.17)	(0.84)	(0.51)**	(0.36)	(0.65)	(0.17)	(0.17)**	(0.43)	(0.52)	(13.93)	(1.02)	(1.74)	(0.46)
$\frac{Rx_{it}}{\sigma(Rx)}$ due to U.S. credit spreads	1.47	-0.05	-1.01	1.34	1.09	4.57	1.31	1.19	0.08	0.54	0.22	-1.89	30.20	-1.16	0.11	-0.82
	(0.74)**	(0.32)	(0.71)	(0.59)**	(0.33)***	(1.34)***	(0.29)***	(0.50)**	(0.11)	(0.17)***	(0.95)	(1.20)	(10.88)***	(0.97)	(1.10)	(0.62)
$\frac{Rx_{it}}{\sigma(Rx)}$ due to local credit spreads		0.17	0.40	1.34	0.37	0.15	0.87	0.73	0.09	0.34	0.60	1.52	-1.70	0.20	1.32	0.85
		(0.29)	(0.54)	(0.65)**	(0.23)	(0.25)	(0.22)***	(0.23)***	(0.08)	(0.13)***	(0.70)	(0.77)*	(2.53)	(0.28)	(0.91)	(0.41)**
Adj. R^2	0.19	0.04	0.14	0.30	0.33	0.38	0.47	0.29	0.43	0.10	0.13	0.28	0.18	0.05	0.11	0.16
N. obs	273	259	279	267	249	275	219	93	171	1719	102	81	94	133	190	669

(c) 2 year

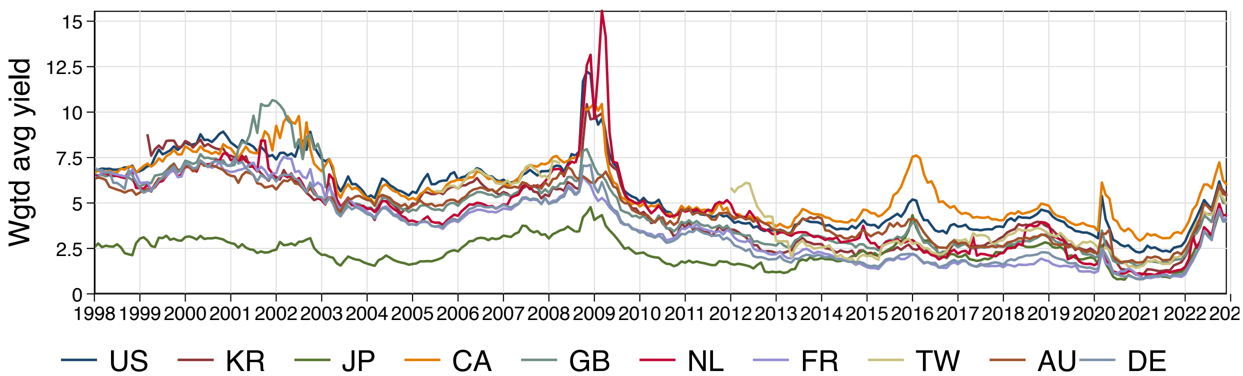
	US	KR	JP	CA	GB	NL	FR	AU	DE	All AE	TH	MX	BR	RU	CL	All EM
$\frac{Rx_{it}}{\sigma(Rx)}$ due to VIX	-9.04	0.25	0.97	-1.02	-0.04	-0.45	-0.30	2.36	0.31	0.09	0.04	-0.81	4.74	-0.81	-0.46	-1.17
	(4.27)**	(0.40)	(0.61)	(1.86)	(0.87)	(1.01)	(0.41)	(0.77)***	(0.25)	(0.23)	(0.54)	(0.81)	(9.75)	(1.07)	(1.79)	(0.57)**
$\frac{Rx_{it}}{\sigma(Rx)}$ due to U.S. credit spreads	1.69	0.08	-1.37	-0.12	0.89	10.84	2.81	2.12	0.47	1.23	1.53	-0.81	17.93	0.51	2.42	0.65
	(2.39)	(0.30)	(1.10)	(0.78)	(0.42)**	(2.83)***	(0.33)***	(0.56)***	(0.40)	(0.22)***	(1.10)	(1.92)	(10.28)*	(1.10)	(1.42)*	(0.77)
$\frac{Rx_{it}}{\sigma(Rx)}$ due to local credit spreads		0.46	-0.14	-0.70	0.00	2.22	2.30	1.74	0.18	0.86	-0.03	0.18	2.84	0.56	2.05	0.67
		(0.23)**	(0.49)	(0.92)	(0.27)	(0.38)***	(0.29)***	(0.26)***	(0.29)	(0.19)***	(0.72)	(1.12)	(1.86)	(0.40)	(1.20)*	(0.48)
Adj. R^2	0.28	0.14	0.05	0.23	0.50	0.31	0.39	0.56	0.70	0.14	0.37	0.33	0.86	0.27	0.41	0.40
N. obs	249	241	255	243	225	254	195	85	147	1560	95	73	70	109	166	537

(d) 3 year

	US	KR	JP	CA	GB	NL	FR	AU	DE	All AE	TH	MX	BR	RU	CL	All EM
$\frac{Rx_{it}}{\sigma(Rx)}$ due to VIX	-10.56	0.42	1.07	-6.41	0.71	-1.07	-1.22	1.67	0.32	-0.23	1.12	0.29	1.88	-2.07	-5.76	-1.71
	(3.94)***	(0.37)	(0.62)*	(1.48)***	(1.33)	(1.25)	(0.54)**	(0.86)*	(0.30)	(0.31)	(0.36)***	(0.95)	(10.29)	(0.66)***	(1.49)***	(0.59)***
$\frac{Rx_{it}}{\sigma(Rx)}$ due to U.S. credit spreads	0.39	-0.25	-1.70	-3.09	1.32	9.58	1.64	1.96	-0.59	0.55	0.07	-3.14	-14.30	-2.92	1.96	0.66
	(1.29)	(0.34)	(1.12)	(0.71)***	(0.65)**	(3.12)***	(0.35)***	(0.63)***	(0.81)	(0.26)**	(0.79)	(1.69)*	(11.48)	(1.78)	(1.01)*	(0.75)
$\frac{Rx_{it}}{\sigma(Rx)}$ due to local credit spreads		-0.09	-1.48	-3.89	-0.19	1.73	1.41	1.29	-0.76	0.25	0.07	-0.43	-3.73	0.68	1.00	-0.25
		(0.24)	(0.61)**	(0.90)***	(0.36)	(0.39)***	(0.33)***	(0.27)***	(0.37)**	(0.21)	(0.62)	(1.27)	(2.20)	(0.24)***	(0.87)	(0.45)
Adj. R^2	0.52	0.17	0.20	0.40	0.70	0.37	0.40	0.22	0.84	0.18	0.24	0.45	0.80	0.65	0.73	0.46
N. obs	225	217	231	219	201	230	171	77	123	1392	86	65	46	85	142	424

Figure 1. Raw secondary market quote data. This figure plots the time series of the weighted average (using USD-equivalent amount outstanding) yields quoted in ICE for non-financial corporate, senior fixed-coupon bonds issued by firms in the top 10 advanced economies, the top 10 emerging market economies, the remaining advanced economies and the remaining emerging market economies. Countries ranked based on total number of unique non-financial corporate fixed-rate bonds issued by issuers domiciled within the country.

(a) Advanced economies



(b) Emerging market economies

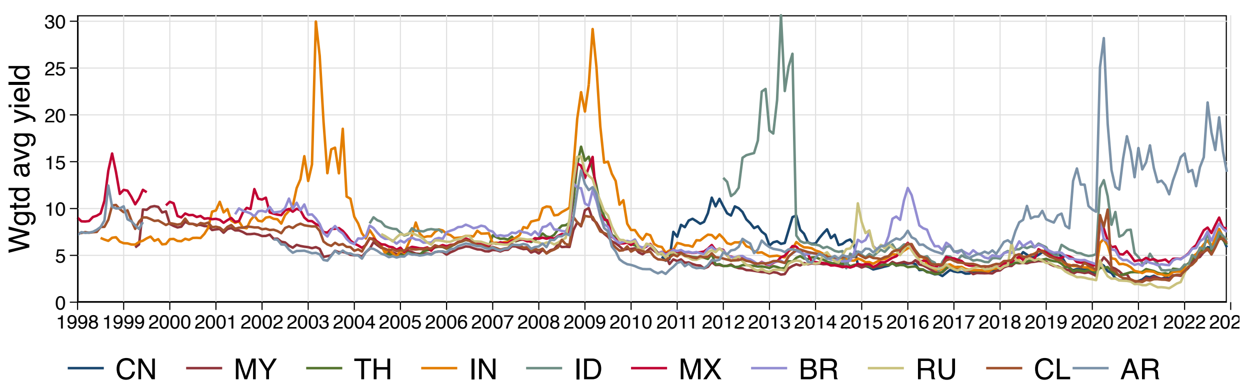
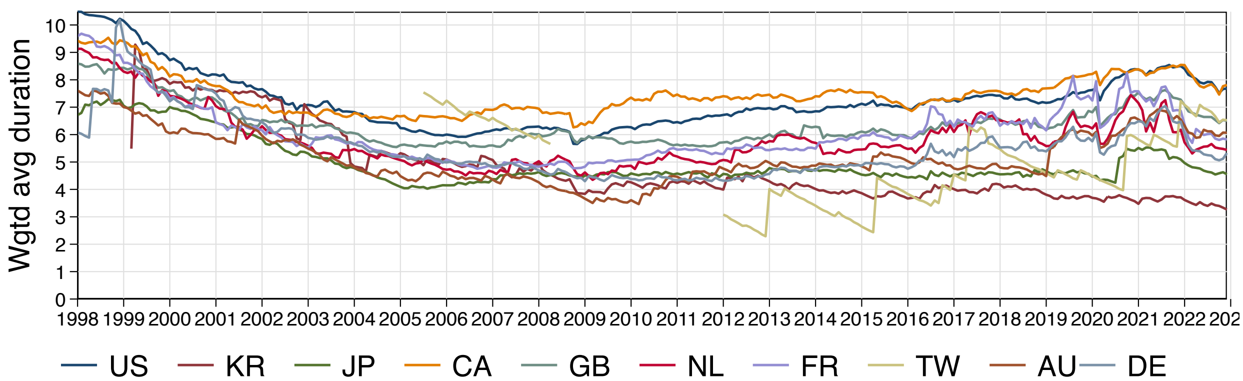


Figure 2. Secondary market duration data. This figure plots the time series of the weighted average (using USD-equivalent amount outstanding) duration for non-financial corporate, senior fixed-coupon bonds issued by firms in the top 10 advanced economies, the top 10 emerging market economies, the remaining advanced economies and the remaining emerging market economies. Countries ranked based on total number of unique non-financial corporate fixed-rate bonds issued by issuers domiciled within the country.

(a) Advanced economies



(b) Emerging market economies

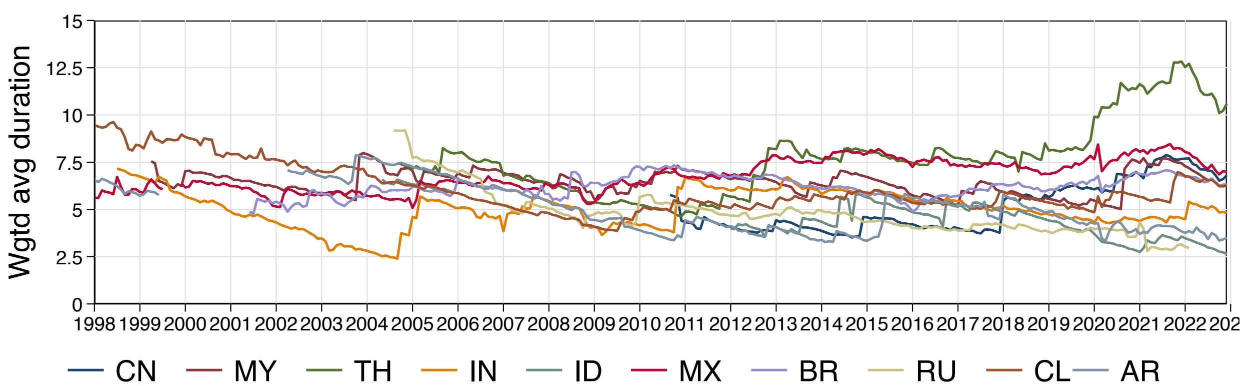


Figure 3. Average differential to USD credit spreads. This figure plots the time series of the average credit spread between non-USD denominated bonds and USD denominated non-financial corporate, senior fixed-coupon bonds. Average credit spreads estimated from repeated cross-sectional regressions of duration-adjusted credit spreads for firms with bonds outstanding in multiple currencies on currency, firm, and rating fixed effects.

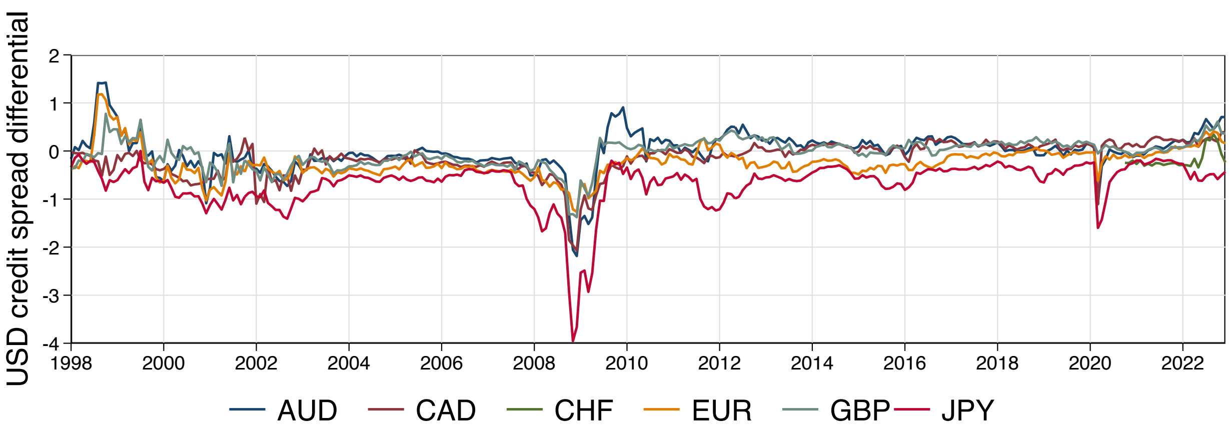
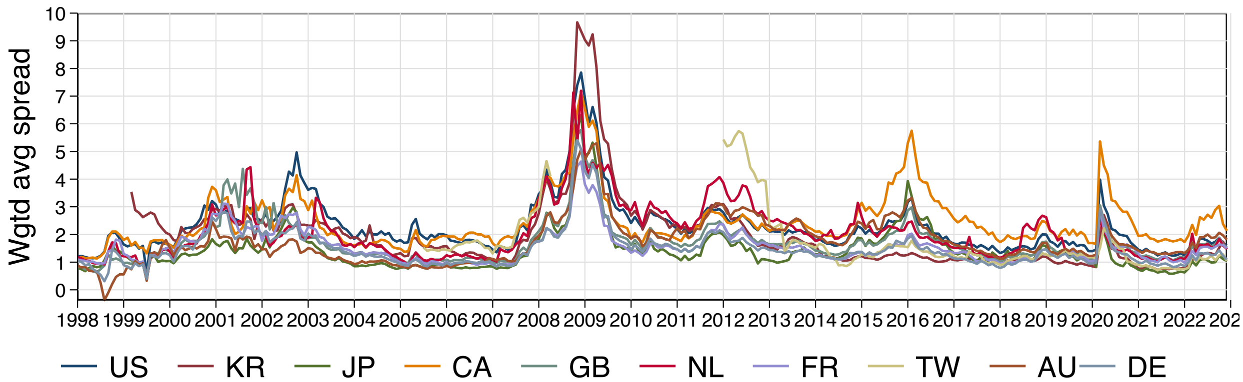


Figure 4. Secondary market duration-matched, currency-adjusted spreads. This figure plots the time series of the weighted average (using USD-equivalent amount outstanding) duration-matched, currency-adjusted spreads for non-financial corporate, senior fixed-coupon bonds issued by firms in the top 10 advanced economies, the top 10 emerging market economies, the remaining advanced economies and the remaining emerging market economies. Countries ranked based on total number of unique non-financial corporate fixed-rate bonds issued by issuers domiciled within the country.

(a) Advanced economies



(b) Emerging market economies

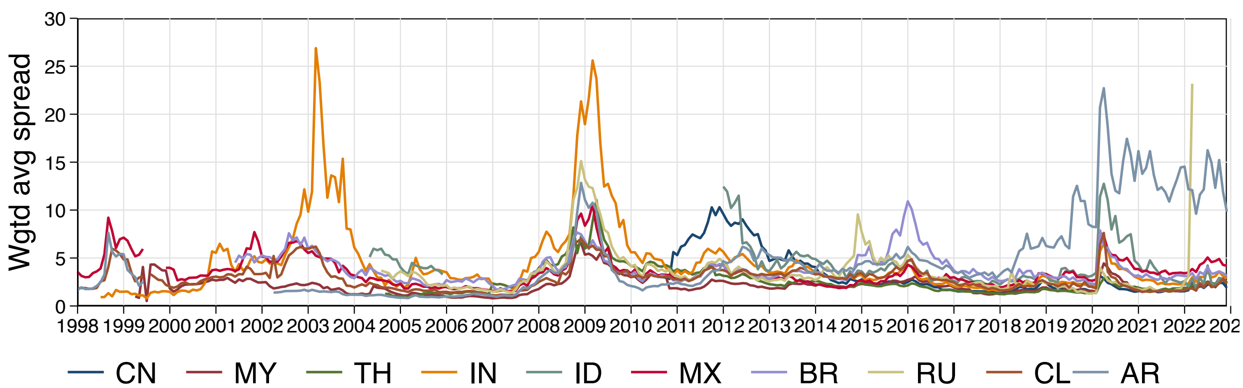
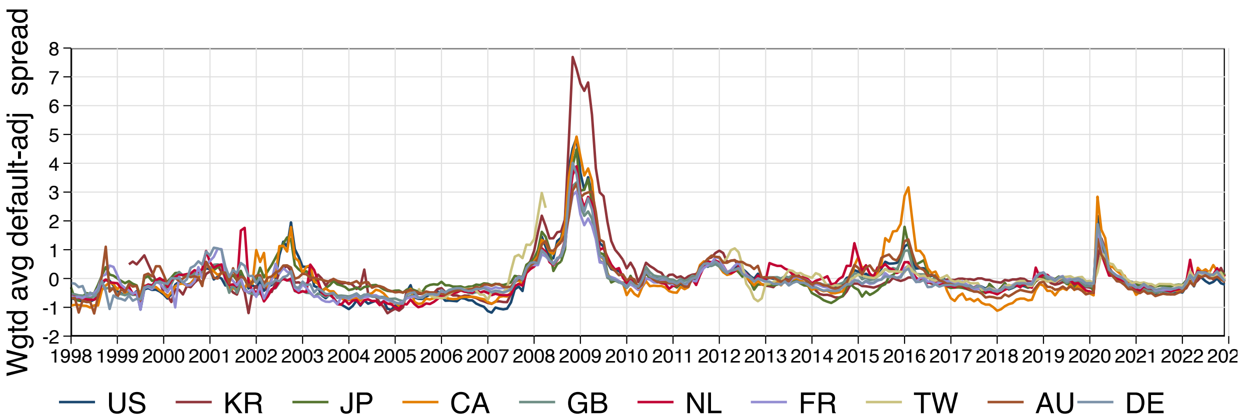


Figure 5. Estimated default-adjusted spreads. This figure plots the time series of the weighted average (using USD-equivalent amount outstanding) default-adjusted credit spreads for non-financial corporate, senior fixed-coupon bonds issued by firms in the top 10 advanced economies, the top 10 emerging market economies, the remaining advanced economies and the remaining emerging market economies. Countries ranked based on total number of unique non-financial corporate fixed-rate bonds issued by issuers domiciled within the country.

(a) Advanced economies



(b) Emerging market economies

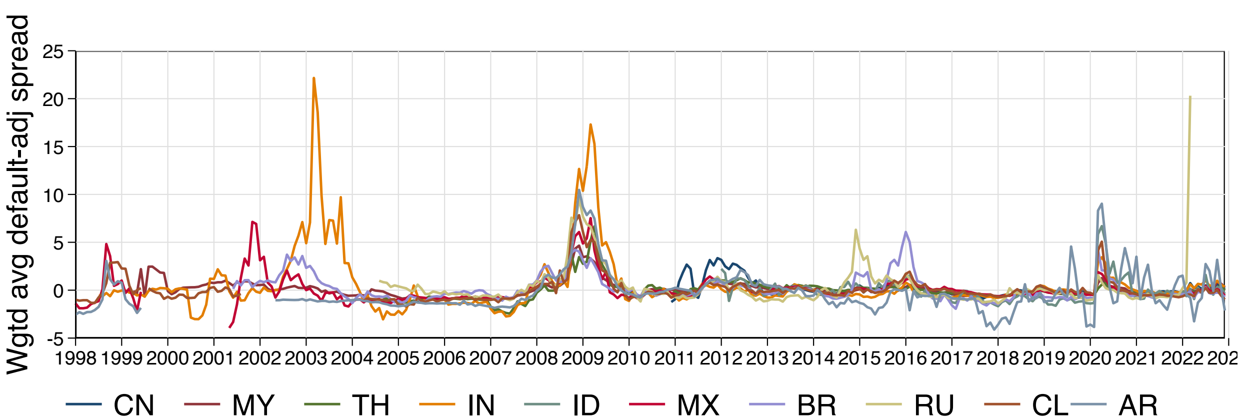
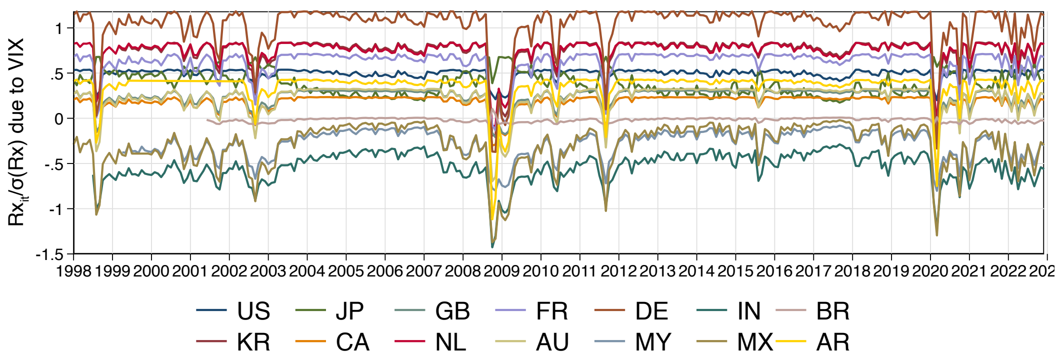
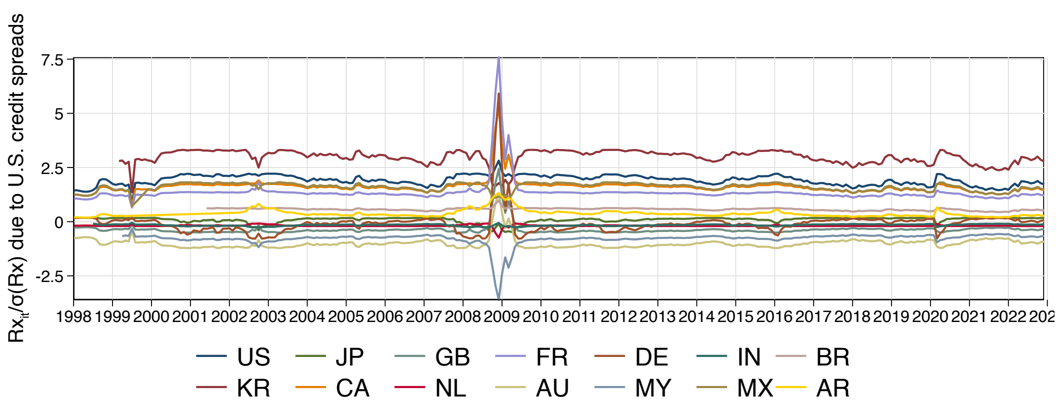


Figure 6. Estimated components of excess returns. This figure plots the time series estimates of the non-linear relationship between expected excess returns and the VIX, U. S. aggregate credit spreads, and country-level aggregate credit spreads. The y-axis in all panels rescaled by the within-period standard deviation of Rx_t^i to display risk-adjusted returns.

(a) VIX



(b) U. S. credit spreads



(c) Local credit spreads

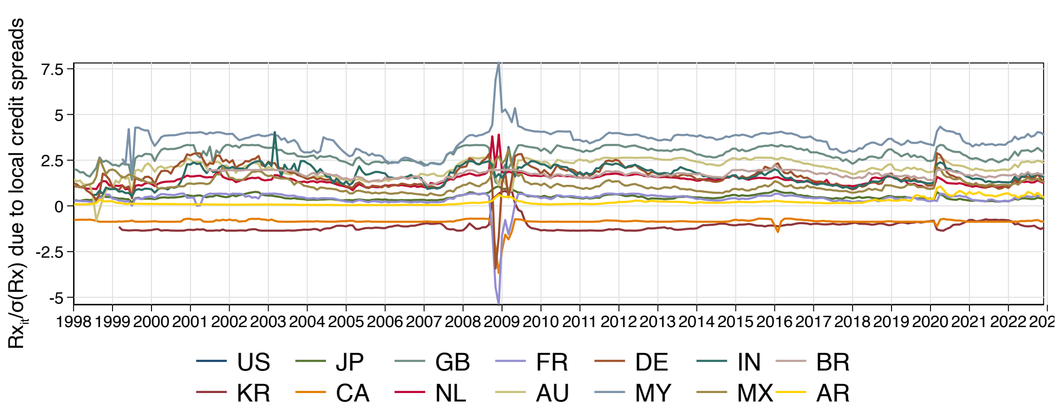


Figure 7. Estimated components of $\phi_h^i(v)$. This figure plots the pre-crisis (January 1998 – July 2007) and the post-crisis, pre-pandemic (January 2010 – December 2019) estimates of the non-linear relationship between expected excess returns and the VIX, U. S. aggregate credit spreads, and country-level aggregate credit spreads. The y-axis in all panels rescaled by the within-period standard deviation of Rx_t^i to display risk-adjusted returns.

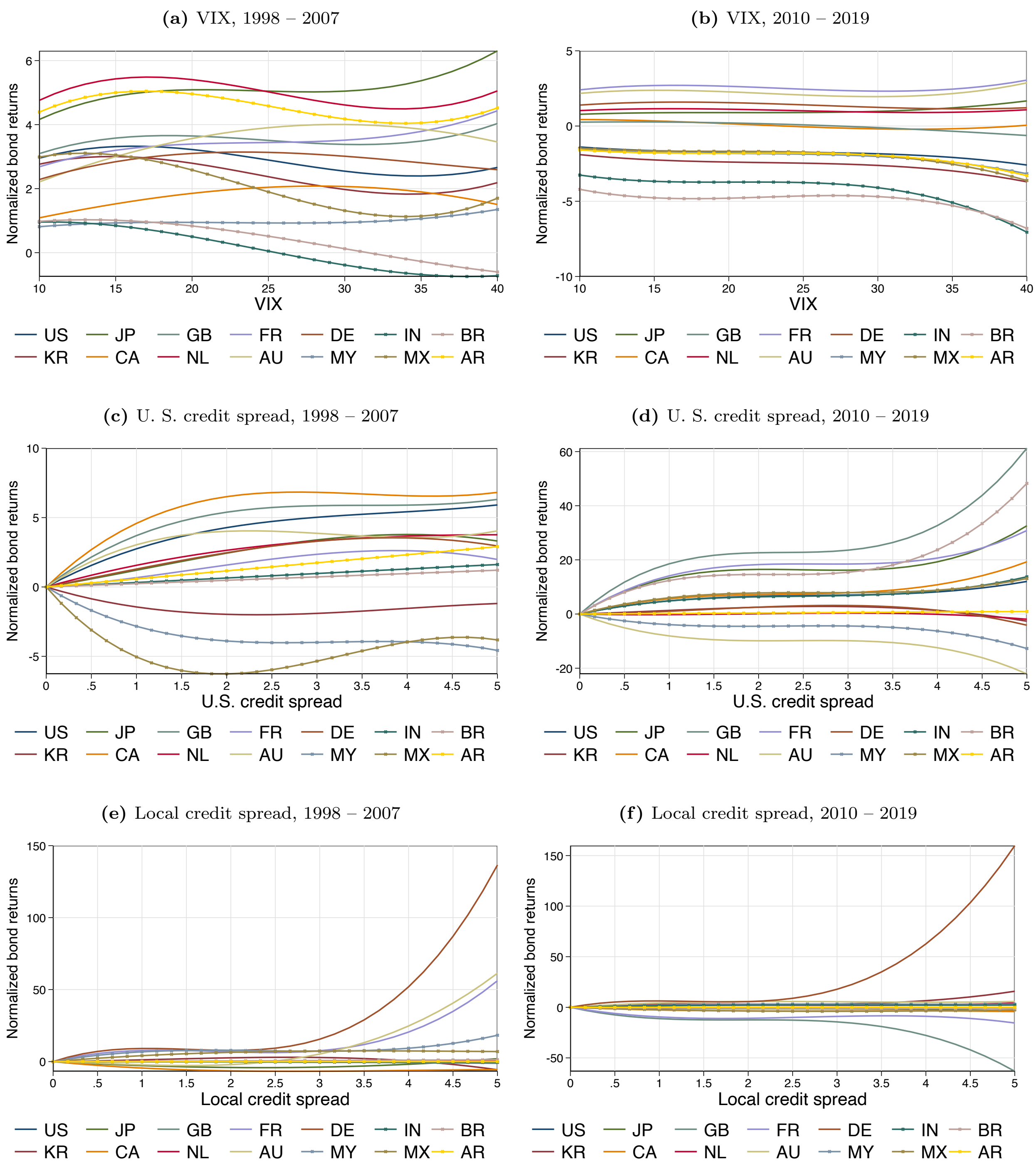


Figure 8. Decomposing U. S. credit spreads. This figure plots contributions to the overall level of U. S. nonfinancial corporate bond spreads from the predicted (in blue) and default-adjusted (in grey) components of credit spreads. Predicted credit spreads estimated from a bond-month level regression of (log) duration-matched spreads on (log) firm-level 1 year expected default frequencies and bond- and firm-level characteristics. Default-adjusted credit spread is constructed as the difference between the observed and the predicted credit spread. Bond level predicted and default-adjusted credit spreads aggregated to an economy-wide level as an amount-outstanding-weighted-average. Full sample (January 1998 – December 2022) estimated relationship used.