BANCA D'ITALIA
EUROSISTEMA

Temi di discussione

(Working Papers)

Global risk aversion and the term premium gap in emerging market economies

by Marco Flaccadoro and Stefania Villa

October 2025

Number 1493

BANCA D'ITALIA
EUROSISTEMA

Temi di discussione

(Working Papers)

Global risk aversion and the term premium gap in emerging market economies

by Marco Flaccadoro and Stefania Villa

Number 1493 - October 2025

ISSN 2281-3950 (online)

Designed by the Printing and Publishing Division of the Bank of Italy

GLOBAL RISK AVERSION AND THE TERM PREMIUM GAP IN EMERGING MARKET ECONOMIES

by Marco Flaccadoro* and Stefania Villa**

Abstract

In this paper we analyze the impact of shocks to global risk aversion on the term structure of sovereign spreads between emerging market economies (EMEs) and the US economy. Focusing on the difference between long- and short-term spreads (i.e. the term premium gap), we find that an increase in global risk aversion reduces the term premium gap. This finding is consistent with the evidence that, during crises, EMEs experience a higher risk of default with respect to safe advanced economies, and to a greater extent at shorter maturities.

JEL Classification: E43, F30, G12, G15.

Keywords: sovereign bond spreads, emerging markets, risk aversion, term structure.

DOI: 10.32057/0.TD.2025.1493

---

* Corresponding author. Economic Outlook and Monetary Policy Directorate, Bank of Italy, Via Nazionale 91, 00184 Rome, Italy. Email: marco.flaccadoro@bancaditalia.it, https://sites.google.com/view/marcoflaccadoro/home.

** Economic Outlook and Monetary Policy Directorate, Bank of Italy, Via Nazionale 91, 00184 Rome, Italy. Email: stefania.villa@bancaditalia.it, https://sites.google.com/site/stefaniavilla3.

We are grateful to Mark Aguiar, Marco Albori, Michele Andreolli, Guido Ascari, Giovanni Bonfanti, Valentina Bruno, Alessandro Cantelmo, Donato Ceci, Lawrence Christiano, Giancarlo Corsetti, Max Croce, Antonio Di Cesare, Wenxin Du, Martin Eichenbaum, Simone Emiliozzi, Laurent Ferrara (discussant), Fabrizio Ferriani, Luca Fornaro, Marco Fruzzetti, Giampiero Gallo, Georgios Georgiadis, Luigi Iovino, Leonardo Melosi, Silvia Miranda-Agrippino, Tommaso Monacelli, Alessandro Montino, Valerio Nispi Landi, Salvatore Nisticó, Marcello Pericoli, Alberto Franco Pozzolo, Giovanni Ricco, Federica Romei, Tiziano Ropele, Barbara Rossi, Luca Sala, Stephanie Schmitt-Grohé, Jesse Schreger, Daniele Siena, Fabrizio Venditti, Giordano Zevi and seminar participants at the Annual Conference of the International Association for Applied Econometrics (IAAE 2024), Bank of Italy, Bocconi University, 2024 Annual Meeting of the Central Bank Research Association (CEBRA), and 11th PhD Student Conference on International Macroeconomics (Université Paris Nanterre) for useful suggestions. Any errors are our responsibility. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Bank of Italy.

1 Introduction

Sovereign spreads between emerging market economies (EMEs) and US sovereign bond yields are a key benchmark for the cost of external capital (Garcia-Herrero et al., 2006). As EMEs rely heavily on foreign-currency bond issuance, mainly in US Dollar (USD) (Onen et al., 2023 and Table 1), policy makers in EMEs should identify the main driving forces of sovereign spreads. In addressing this issue, one strand of literature focuses primarily on the impact of movements in domestic variables (i.e. fundamentals, or pull-factors) on country spreads, following the seminal work by Edwards (1984). Recent advances in the literature, instead, highlight the importance of external push-factors (e.g. Uribe and Yue, 2006; and González-Rozada and Yeyati, 2008), showing that a large fraction of the variability of emerging market spreads is driven by exogenous changes in world interest rates or in the risk aversion of international market participants.

Despite the general understanding that external factors have a significant role in driving emerging market spreads, an analysis of spreads along the whole term structure has not yet been thoroughly conducted. Our paper fills this gap by proposing a detailed analysis of how the difference between long- and short- term spreads in EMEs, which we label *term premium gap*, responds to exogenous changes in the attitude of international investors toward risk, which we label global risk aversion shocks.[1] In particular, our objective is to assess the impact of risk-off episodes on international investors' demand for risky EME sovereign bonds, which are issued in USD, across maturities. Our research question is the following: do risk aversion shocks exert different impacts on spreads at long- and short-term maturities and, thus, affect the term premium gap?

We find that this is indeed the case, as an exogenous rise in global risk aversion increases more short- rather than long-term spreads, thus inducing a reduction in the term premium gap. Our findings also show that during crises spreads widen at all maturities, thus increasing the incentives for EMEs to borrow long-term in normal times. This, in fact, would make less likely to roll-over the extant debt at time of financial turmoils, thus reducing the borrowing costs. Our work rationalizes the observed increase in the average maturity of government debt in EMEs (Micic, 2017; and OECD, 2022).

Our analysis is based on zero-coupon sovereign bond yield data for five large emerging market economies (Brazil, Colombia, Mexico, South Korea and Turkey) and one benchmark "safe" advanced economy (US economy) from the late 1990s to 2020. Then, we use yield data to estimate yields curves via the methodology of Diebold and Li (2006), as it allows us to compare the same set of maturities across countries. We thus improve

[1] Our measure of term premium gap can be also interpreted as an estimate of the cost of financing long- vs. short-term in EMEs relative to safe AEs. Risk aversion shocks are usually defined as exogenous variation in the marginal investor's ability to bear risk (Berthold, 2023).

upon the use of a unique maturity-horizon, such as the EMBI spread.[2] We consider only bonds in USD due to the central role of USD denominated debt in EMEs (Bruno and Shin, 2015a; Bruno and Shin, 2015b; Du et al., 2018; and Corsetti et al., 2023, among others).[3] This choice allows us to focus on the default risk channel to explain the difference in yields between "risky" EMEs and the "safe" US economy, mitigating the role of exchange rates.

We first estimate a proxy for global risk aversion for the US financial markets according to the approach of Bekaert et al. (2013) that decompose the squared VIX index into an "expected volatility" term, which they interpret as a measure of uncertainty, and a residual term, which they consider as a proxy for risk aversion. Although closely related, measures of risk aversion and uncertainty capture distinct concepts. Following Cascaldi-Garcia et al. (2023), risk refers to situations where outcomes are unknown but the underlying probability distribution is known, whereas uncertainty arises when both the outcome and the probability distribution remain unknown.

Then, we conduct our empirical analysis via a panel local projection model (Jordà, 2005). The use of a wide set of contemporaneous controls ensures that our measure of risk aversion is not reflecting other macroeconomic shocks, and is equivalent to identifying a shock in a VAR via a recursive scheme. The spirit of the identification scheme is close to Akinci (2013) and aims to disentangle the exogenous component of the US-based proxy for global risk aversion from the one predicted by US monetary policy and both global and country-specific financial conditions. The "small" dimension of each emerging market economy allows us to safely assume no feedback effects with international financial markets. As a consequence, the estimated global risk aversion shocks might be considered truly exogenous for each EME. In addition, to isolate the demand of international investors for EME sovereign debt, our empirical analysis is restricted to periods in which EMEs do not issue sovereign bonds denominated in USD.

Our findings provide evidence for the existence of a "default risk channel": risk-off episodes are associated with a significant increase in the perceived credit risk of sovereign bonds issued by emerging market economies (EMEs). To investigate this mechanism more thoroughly, we use credit default swap (CDS) spread data on EME and US sovereign bonds denominated in USD. We find that an increase in risk aversion determines a substantial rise in EME CDS spreads, while exerting only minimal effects on the perceived riskiness of US Treasuries. By comparing the CDS response across EMEs and the United

[2] The data on the EMBI spread are collected from JP Morgan on the series labeled EMBI Global. They include EME sovereign bonds issued in USD, with an high degree of liquidity and with a typical maturity of $2-3$ years.

[3] Furthermore, recent evidence on sovereign debt issued by EMEs points to an increase in the amount issued in USD and to a drop in the local currency one (Bertaut et al., 2023).

States, we demonstrate that exogenous increases in risk aversion lead to a disproportionately larger increase in the perceived riskiness of EME sovereign bonds relative to comparable US government securities, with the effect being particularly pronounced at shorter maturities. As a consequence, yields in EMEs rise, while they fall or remain broadly constant in the US due to flight to safety, hence widening the spreads. This mechanism is stronger at shorter maturities, as the shocks decrease US yields especially at the short-hand of the yield curve. This, mechanically, induces a reduction in the term premium gap in response to risk aversion shocks.

The relationship between EME sovereign debt spreads and global risk aversion has been extensively studied in the empirical literature over the past decades (see Garcia-Herrero et al., 2006, Bellas et al., 2010, Broner et al., 2013, Csonto and Ivaschenko, 2013, Kennedy and Palerm, 2014, Ahmed, 2023, among others). The paper that is mostly related to ours is Broner et al. (2013). They show that, for debt issued in foreign currency (i.e. USD, and Euro or Deutsche mark), an exogenous increase of country-specific risk aversion on behalf of international investors determines a higher surge in the cost of issuing long term debt in EMEs at longer maturities. Conversely, we find that an exogenous increase in global risk aversion causes long-term spreads increasing less than short-term ones. We depart from their analysis along several dimensions, the most relevant of which is that we focus on the demand of international investors for emerging market economy sovereign debt, by restricting the analysis on those dates in which EMEs do not issue sovereign bonds denominated in USD. As a consequence our results are not affected by a "supply-side" effect, namely the issuance behavior of governments - identified by Broner et al. (2013) -, whereby emerging market governments take into account investors' risk aversion when deciding on the maturity structure of their debt issuance. Second, we estimate the response to global risk aversion shocks of yields, spreads and term premium gaps of EME sovereign debt issued in USD, rather than in a mix of USD and Euro or Deutsche mark. As US Treasuries experience a time-varying premium over the safe assets of other advanced economies (Du et al., 2018), distinct results are to be expected. Finally, we build on the literature that assigns to a global factor, related to risk aversion of financial intermediaries, a key role in explaining the sovereign default risk (Longstaff et al., 2011) and, more generally, the co-movement in risky asset prices, capital flows, and leverage of global intermediaries around the world (Miranda-Agrippino and Rey, 2020; Miranda-Agrippino and Rey, 2022; and Cascaldi-Garcia et al., 2023).[4]

The paper is organized as follows. Section 2 presents the data and describes our measure of global risk aversion, yields, spreads and term premium gap. Section 3 discusses

[4]Additional studies investigate the role of the US dollar for the transmission of global risk to the world economy (e.g. Georgiadis et al., 2024).

Sovereign bonds outstanding for a sample of EMEs.
Averages 2005 – 2022

	Brazil	**Colombia**	**South Korea**	**Mexico**	**Turkey**
All currencies (USD Billions)	1162.4	98.3	545.3	324.4	218.5
Foreign currency (USD Billions)	46.1	20.9	6.7	54.9	62.1
Foreign currency (%)	4%	21.3%	1.2%	16.9%	28.4%

Table 1: Amount of outstanding sovereign bonds with maturity longer than one year. Source: Onen et al. (2023). Units of measure: Billions of USD and percentage points.

the econometric strategy. Section 4 shows our empirical results, while robustness checks are reported in Section 5. Section 6 briefly concludes. An appendix complements the paper by discussing: (a) details on the construction of the dataset; (b) additional robustness exercises; (c) the transmission mechanisms via a simple three-period model; and (d) a deeper analysis on the connection between our results and the existing literature.

2 Data and financial metrics

Our data set includes variables that span from June 1998 to October 2020, where applicable, at a daily frequency. Country-specific data are collected for five emerging economies: Brazil, Colombia, Mexico, South Korea, and Turkey.[5] The sample has a different starting point for each country and variable, depending on data availability. We select countries and sample period mainly due to the availability of daily data on zero-coupon sovereign bond yields. For each emerging market we collect data on zero-coupon sovereign bond yields at different maturities, denominated in USD. As a benchmark to calculate spreads and excess term premium, we also include data on safe zero-coupon bond yields issued by the United States in USD (Table A.1). In addition, to disentangle the default risk channel, we collect daily data on CDS spreads for sovereign bonds issued in USD, as well as for comparable US Treasury securities across short (i.e. 1 year) and long (i.e. 10 years) maturities, for each emerging market and for the United States (Table A.2). Furthermore, to isolate the demand from international investors for USD-denominated sovereign bonds issued by emerging market economies, we gather data on their timing of debt issuances (Table A.3). In our baseline analysis, we rely on an US-based proxy for global risk aversion that we estimate in line with Bekaert et al. (2013), by using a set of US financial variables: the S&P 500 implied volatility index (VIX); and the non-parametric measures of realized volatility for the S&P 500, provided by Heber

[5]We treat South Korea as an emerging market, according to key financial market indexes (e.g. MSCI) and BIS classification (Micic, 2017). Neverthless, we have verified that the main results are robust to the exclusion of South Korea from the sample.

et al. (2009) (Table A.5).

We also include a wide set of country-specific and global variables to alleviate the concerns that our estimation is picking up the effects of non-risk-aversion shocks (Table A.4 and A.5). For each country, we consider the stock market price index and the bilateral nominal exchange rate with USD. Finally, we include: a global commodity price index and the global oil price, as a proxy of changes in the international commodity cycle; and the Geopolitical Risk series of Caldara and Iacoviello (2022) that captures adverse events associated with wars, terrorism, and any tensions among states that affect international relations. All variables, but the latter, are expressed in log differences at the daily level. Finally, to validate our measure of global risk aversion—discussed in detail below—we collect data on nominal effective exchange rates for safe haven countries, such as the United States, Japan, and Switzerland, as well as for non-safe-haven advanced economies, including the Euro Area and the United Kingdom (Georgiadis et al., 2024).

This section also shows our measure of global risk aversion and describe the key metrics to investigate to what extent risk-aversion shocks affect the term premium emerging markets pay compared to the US. When it comes to the latter, we use the differences in spreads, between EME and US yields, across different maturities, as a proxy of the gap in financing costs across the term structure for EME compared to the US economy. An obvious concern is that long-term bonds issued by EMEs might be illiquid. If this were the case, long-term spreads between long-term EME and US yields would reflect not only different risks of default but also differences in liquidity. Although in principle we cannot rule out this hypothesis, recent analyses find an average maturity between twelve and fifteen years for the outstanding amount of EME sovereign bonds issued in USD (Bertaut et al., 2023). This is consistent with a substantial tradable amount of EME bonds at the long-term maturities considered in our analysis.

2.1 Global risk aversion

We obtain our baseline US-based proxy for global risk aversion, at a daily frequency, by implementing the approach of Bekaert et al. (2013). The procedure is based on decomposing the (squared) VIX into a risk aversion, RA, and a pure volatility component, $\widehat{RV}$, measured by the expected monthly variance of the S&P 500 returns. An intuition for the suggested decomposition is that the squared VIX approximates well the expected value of monthly return variance for the S&P index based on "risk-neutral" probabilities (Carr and Wu, 2009); while the S&P expected variance, $\widehat{RV}$, builds on "physical", or actual, probabilities. The difference between "risk-neutral" and "physical" expected variance is the "variance risk premium", accounting for the return demanded by investors to be exposed to variance risk, which is increasing in risk aversion (Bekaert and Hoerova, 2014). The variance risk premium is commonly employed as a time-varying proxy for risk aversion (Rosenberg and Engle, 2002). Empirical evidence further shows that it serves as one of the most reliable predictors of returns across a wide spectrum of U.S. and international financial assets (Bollerslev et al., 2009).

This approach is implemented in two steps. First, we obtain a measure of S&P 500 *predicted* monthly variance of returns $\widehat{RV}_t$, which is interpreted as the degree of uncertainty that financial markets expect over the calendar month terminating in t, following the convention of considering one calendar month composed of 22 business days. To do so, we calculate the monthly realized variance as the sum of daily variances of S&P 500 returns within the same month.[6] Then, we project the monthly realized variance of returns onto the lagged squared VIX[7] and lagged realized monthly variance, as:

$$RV_t = c_0 + c_1 VIX^2_{t-22} + c_2 RV_{t-22} + e_t. \tag{1}$$

The fitted value of the regression, $\widehat{RV}_t$, is the *predicted* variance of returns of the S&P 500 over a monthly horizon.

As a second step, we decompose the squared VIX into a risk aversion and an uncertainty component and estimate global risk aversion, RA_t, as:

$$RA_t = VIX^2_t - \widehat{RV_{t+22}}. \tag{2}$$

As the VIX^2_t refers to the "risk-neutral" variance expected for the following month (i.e. 22-business days) given the information available in period t, we compare it with the "physical" variance forecasted in t for horizon $t + 22$. Reassuringly, our measure of global risk aversion peaks during well-known periods of financial distress, thus capturing relevant global shocks, among them: the stock market downturn of 2002, the Global Financial Crisis (2007-2009), the European Sovereign Debt Crisis (2011-2012) and the turmoil related to the Covid-19 crisis (2020), as reported in Figure 1.

[6] In order to obtain daily measures of monthly realized variances, we simply sum the observations of daily variances over a fix time span of 22 business days (one calendar month), as in Bekaert et al. (2013) and in Bekaert and Hoerova (2014). Heber et al. (2009) provide an array of daily measure of S&P 500 return variances, by following Barndorff-Nielsen et al. (2008) we choose the realized kernel variance (non-flat parzen) (Table A.5).

[7] Note that the VIX is a measure of volatility, which is annualized and expressed in percentages. Therefore, in order to make it comparable to the estimated monthly realized variance of returns, we divide it by a scaling factor of 120000.

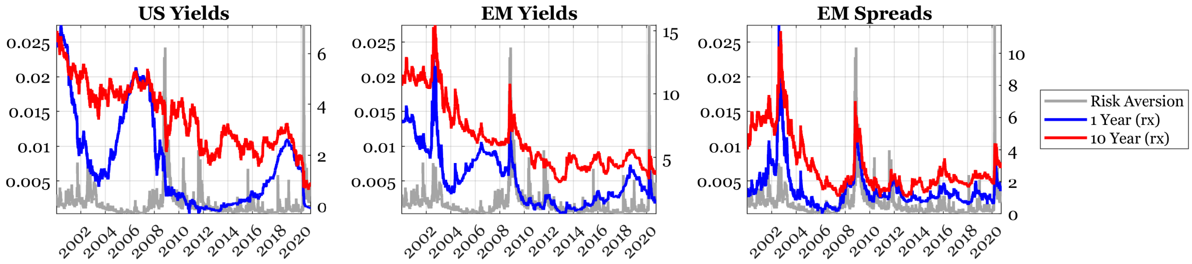

Figure 1: Yields, spreads, and global risk aversion shocks. Emerging markets variables are obtained as a simple average across the countries in the sample. Unit of measure for yields and spreads are percentage points; the daily global risk aversion series is expressed in percent.

2.2 Yields, spreads and term premium gap

We now describe the procedure to obtain our measure of yields, spreads and term premium gaps between emerging markets and safe advanced economies.

As raw data on yields are not available for the same set of maturities across all the countries in our sample, as a preliminary step we estimate yield curves. We use the methodology of Diebold and Li (2006), in the framework of Nelson and Siegel (1987), on daily zero-coupon yield data for our sample of EMEs and US. This allows us to obtain an homogeneous set of zero coupon yields, spanning from 1 month to 15 year maturity, for the whole set of countries in our sample.

We use the above data to estimate the spread $s_{i,t,\tau}$ for country-i and maturity-τ, as the difference between the yield on country-i bond denominated in USD $yield^{USD}_{i,t,\tau}$, and the comparable US bond yield, $yield^{USD}_{US,t,\tau}$:

$$s_{i,t,\tau} = yield^{USD}_{i,t,\tau} - yield^{USD}_{US,t,\tau}.$$

The estimated yields and spreads are very volatile, and the gap between long- and short-term maturities (i.e. the difference between the red and blue lines; Fig. 1) varies significantly with our measure of global risk aversion. As expected, long-term yields are usually higher than short-term ones, both in the US economy and in EMEs. During period of high risk-aversion yields decline in the US economy both at short- and long-term maturities; while they increase sharply in EMEs. This is to be expected, as in period of low risk appetite, international investors rebalance their portfolio in favour of safe assets (e.g. US Treasuries), as shown in the first two charts of Figure 1. As a result, spreads increases sharply in EME in periods of high risk aversion. Interestingly, when global risk aversion is high, the difference between long- and short-term spreads narrows (third chart of Figure 1): the spread curve flattens or even inverts. This is not surprising, as default takes place during a crisis and crisis do not last forever, default risk increases

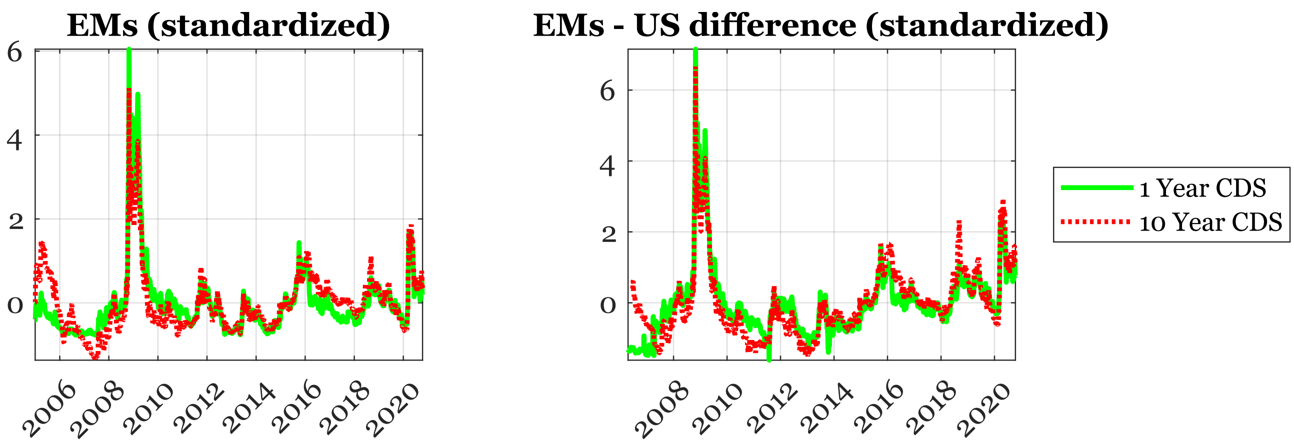

Figure 2: Standardized credit default swap data related to the sovereign bonds at one and ten year maturity, issued in USD. Emerging markets variables are obtained as a simple average across the following countries: Brazil, Colombia, Mexico, South Korea and Turkey. Data are standardized. Unit of measure: units of standard deviation.

especially at short maturities during such events.[8]

This is consistent with the dynamic of the CDS spreads related to sovereign bonds issued in USD from emerging market i with maturity τ, $CDS^{USD}_{i,t,\tau}$. In average, they increase more at shorter maturities in case of tension in the global financial markets (e.g. global financial crisis 2007-2009) (Figure 2, left column). A similar picture emerges upon investigating the differences in the CDS, which we label *CDS spreads*, between emerging markets and the US: $CDS^{s}_{i,t,\tau} = CDS^{USD}_{i,t,\tau} - CDS^{USD}_{US,t,\tau}$. In fact, during periods of crisis they increase across all maturities, in particular at the shorter-term ones. In simpler terms, during risk-off periods EME sovereign bonds are perceived riskier than comparable US treasuries, specifically at shorter maturities (Figure 2, right column).

To investigate the impact of risk-aversion shocks on the term premium emerging markets pay compared to the US, we compute the *term premium gap* as the difference between spreads on long-term bonds with maturity τ_2 and on short-term bonds with maturity τ_1, as:

$$\text{term}_{i,t,\tau_2-\tau_1} = s_{i,t,\tau_2} - s_{i,t,\tau_1}. \tag{3}$$

We use this measure to estimate the excess return emerging markets pay to borrow at longer maturities, compared to the safe US economy.[9]

Finally, to directly investigate the "default risk channel", we compute the gap related to the CDS of emerging market sovereign bonds compared to the US ones between

[8]Bond spreads may also be influenced by other bond characteristics unrelated to default risk, such as maturity and coupon rate (Cecchetti and Di Cesare, 2012).

[9]Note that our definition of term premium gap is equivalent to measuring it as the difference in the yield curve "slope" (i.e. the difference between long- and short-term yields) between EMEs and US.

short (i.e. τ_1) and long (i.e. τ_2) maturities, which we label *CDS term premium gap*: $CDS^{term}_{i,t,\tau_2-\tau_1} = CDS^{s}_{i,t,\tau_2} - CDS^{s}_{i,t,\tau_1}$.

3 Econometric Setup

As illustrated above, the goal is to estimate the response of the term premium gap of emerging markets to global risk aversion shocks. We use a panel local projection model in the spirit of Jordà (2005). We follow this methodology instead of vector autoregressive (VAR) models because local projections are considered more robust to mispecification as they do not impose restrictions on the dynamic responses of the variables of interest. As a preliminary step, we estimate the responses of a set of global variables - namely, the (log) VIX and the (log) nominal effective exchange rates of advanced economies - to our risk aversion shocks to verify whether the measure actually elicits a search for safety. Then, in order to rationalize the results we obtain for the term-premium gap, we investigate the response of its "building blocks" to risk aversion shocks. First, we study the response of EME and US yields at different maturities, capturing the impact of the shock on their term structure. Second, we estimate the response of spreads at short and long maturities. Third, we measure the impact of the shock on our measure of the term premium gap that emerging markets pay compared to the US. To further examine the role of the default risk channel in accounting for our results, we analyze the response of the perceived riskiness of emerging market and US bonds to changes in risk aversion, as proxied by CDS contracts. Following a similar approach to the previous analysis, we begin by estimating the responses of CDS spreads at both short and long maturities for EMEs and the United States. We then compute the differential in CDS spreads between EME and US bonds denominated in US dollars. Lastly, we focus on the gap between short- and long-term CDS differences to capture the changes in the perceived riskiness between short and long maturities. To better capture the demand of international investors for EME sovereign debt, our empirical analysis focuses exclusively on periods when EMEs do not issue sovereign bonds denominated in USD.

3.1 Local projection model

We now estimate the dynamic responses at various daily horizons, $h = 1, \ldots, H$, to risk aversion shock via a panel local projection. In particular, we estimate the following set of regressions:[10]

$$
\begin{aligned}
y^{USD}_{i,t+h,\tau} - y^{USD}_{i,t-1,\tau} &= \alpha_{h,\tau} + \gamma_{i,h,\tau} + \beta_{h,\tau} RA_t + \Gamma_{h,\tau}(L) RA_{t-1} \\
&+ \Omega_{h,\tau}(L) \Delta y^{USD}_{i,t-1,\tau} + B_{h,\tau} X_{i,t} \\
&+ C_{h,\tau}(L) X_{i,t-1} + \upsilon_{i,t+h,\tau}, \qquad (4)
\end{aligned}
$$

$$
\begin{aligned}
w_{i,t+h,\tau_2-\tau_1} - w_{i,t-1,\tau_2-\tau_1} &= \alpha_{h,\tau_2-\tau_1} + \gamma_{i,h,\tau_2-\tau_1} + \beta_{h,\tau_2-\tau_1} RA_t + \Gamma_{h,\tau_2-\tau_1}(L) RA_{t-1} \\
&+ \Omega_{h,\tau_2-\tau_1}(L) \Delta w_{i,t-1,\tau_2-\tau_1} + B_{h,\tau_2-\tau_1} X_{i,t} \\
&+ C_{h,\tau_2-\tau_1}(L) X_{i,t-1} + \upsilon_{i,t+h,\tau_2-\tau_1}, \qquad (5)
\end{aligned}
$$

where $y \in \{yield^{USD}_{i,t+h,\tau}, s_{i,t+h,\tau}, CDS^{USD}_{i,t,\tau}, CDS^{s}_{i,t,\tau}\}$ and $w \in \{term_{i,t+h,\tau_2-\tau_1}, CDS^{term}_{i,t,\tau_2-\tau_1}$ $\}$, where the variables are defined as above. In particular, upon availability, we compare a set of short term bonds, with maturity of three months and one year (τ_1), with a set of long term bonds, with maturity ten and fifteen years (τ_2). In addition, $\alpha_{h,\tau}$ is the constant term; $\gamma_{i,h,\tau}$ denotes country fixed effect; RA_t is our global risk aversion measure, which is estimated according to the procedure above, whose lags are included to control for potential predictability and autocorrelation.

As our aim is to isolate exogenous variation in risk aversion, we control for a wide set of country-specific and global variables, $X_{i,t}$, such as: the first-difference of country i stock price index, controlling for expected macroeconomic conditions related to country i;[11] the first-difference of country i bilateral nominal exchange rate with USD, controlling for a depreciation in domestic currency that may affect the financial stability of the EME; the first-difference of a global commodity price index and of oil price to control for changes in commodity prices; the geopolitical risk variable of Caldara and Iacoviello (2022) that captures adverse events that affect international relations; and, finally, the first difference of the 1-year US Treasury yield, as a proxy of the US monetary policy

[10] To measure the response of yields and CDS for the US economy (i.e. i=US), as well as the (log) VIX and the (log) nominal effective exchange rates for a set of advanced economies, we compute equation (4) by considering US yields issued in USD, US CDS, the (log) VIX and the (log) nominal effective exchange rates of country $j \in$ {US, Japan, Switzerland, Euro Area, and the United Kingdom} as dependent variables y. Consistently with the main specification, we control for the following variables: the first-difference of a global commodity price index (in logs), of the oil price (in logs), and of the 1-year US Treasury yield; and the geopolitical risk variable of Caldara and Iacoviello (2022).

[11] Broad stock market price indexes reflect the (average) returns across the cross sections of firms that are quoted in the country stock exchange. If firms quoted in the stock exchange are also operating in the same country, then the stock market index is, at least in part, reflecting the average (expected) performances (i.e. returns) of the overall economy.

stance.[12] Most variables are expressed in logs, with the exception of the last two. The core of the identification scheme is close to Akinci (2013). Its aim is to disentangle the exogenous component of the US-based proxy for global risk aversion from that predicted by US monetary policy and both global and country-specific financial conditions.[13] In the baseline analysis, we set the lag polynomial $L = 4$ – i.e. we control for five lags (i.e. one week) of the shock and of the endogenous variables – while we insert both present and lagged country-specific and global variables.[14]

We estimate standard errors robust to cross-sectional and time-series correlation, following Driscoll and Kraay (1980). They provide a suitable econometric tool for panel local projection analysis, which are potentially characterized by cross-sectional correlation across countries, and time-series correlation in the residuals of the estimations.

4 Results

This section shows the results from the local projection model. We report the responses to an adverse global risk aversion shock that increases the 1-year spread between EME and US yields by 1 percentage point after a monthly horizon. The responses are computed up to 44 business days, representing two calendar months. Our choice of the time horizon derived from the fact that the responses of the term premium gap become not stastically significant after a 2-month horizon.

First of all, we show the responses of global variables to our risk aversion shock (Figure 3). A global risk shock increases the VIX and appreciates safe-haven currencies - such as the US Dollar, the Japanese Yen and the Swiss Franc -; conversely, it depreciates the currency of non safe-haven advanced economies, as the UK pound. This is to be expected, as the demand for sovereign bonds issued by safe-haven countries increases in response to risk shocks (e.g. Georgiadis et al., 2024).

Then, we estimate the response to risk shocks of both EME and US yields and compare it across the whole term structure (Fig. 4). Adverse risk aversion shocks lead to a significant and persistent increase in the sovereign bond yields in EME, across the whole term structure; while they decrease US yields, more markedly at shorter maturities. Interestingly, it is immediate to see an almost parallel "shifting up" of EME yield curve

[12]The usage of the 1−year interest rate to measure the monetary policy stance in the US has been widely accepted in the literature (Gertler and Karadi, 2015 and Miranda-Agrippino and Ricco, 2021, among others).

[13]Akinci (2013) estimates a VAR at a quarterly frequency and defines "global financial shock" the innovations in US financial risk variables that are orthogonal to present and lagged US interest rates.

[14]Our baseline results are broadly consistent to controlling for a month (22 business days) of daily observations. Relevant studies, using daily data to analyse the impact of US monetary policy shocks on financial variables, employ a similar lag structure (e.g. Wright, 2012).

across all maturities; while the US term structure would "rotate", with a decline in yields more pronounced at shorter maturities. This insight will prove useful upon investigating the response of spreads at several maturity, which we show next.

Furthermore, the result on yields is in line with the interpretation of the shock being an innovation in the risk bearing capacity of international investors that, at a time of financial turmoil, would rebalance their portfolio toward short-term safe assets (Krishnamurthy and Vissing-Jorgensen, 2012). In fact, in response to the risk shock the CDS, written on sovereign bond issued in USD, increase both at short and long maturities in EMEs (Fig. 5, first row); in contrast, the perceived riskiness of US treasuries rises marginally only at long maturities (Fig. 5, second row).

Adverse global risk aversion shocks increase spreads in EMEs, especially at short maturities, as shown in Figure 6. This finding is in line with the relative movements of EME and US yields across the term structure and also reflects the increase in the perceived riskiness of EME bonds, compared to US Treasuries, during risk-off episodes (Fig. 7). In addition, the response is statistically significant and consistent with the literature (e.g. Hofmann et al., 2020), which associates an increase in the risk aversion of international financial markets with a rise in spreads between emerging market sovereign bonds and comparable bonds issued by the US economy.

Finally, we estimate regression (5) using as a dependent variable the term premium gap pertaining both to sovereign bonds and CDS. Our findings show that in response to global risk-aversion shocks, the term premium gap *decreases*, at a statistically significant level, for all pair of maturities (Figure 8). In simpler terms, global risk aversion shocks determines a flattening of the yield curve slope (i.e. the difference between long- and short-term yields) in EMEs, compared to the US. This result builds on the stronger response of spreads at short maturities (i.e. 3 months and 1 year) and can be rationalized in terms of demand for long- and short-term sovereign bonds via the default risk channel. As discussed by Krishnamurthy and Vissing-Jorgensen (2012) and Greenwood et al. (2015), among many others, investors value the liquidity and safety attributes of bonds, in particular of the US Treasury. Hence, in period of high risk aversion the demand for short-term safe assets rises, leading to an increase in their price and a fall in their yield. This mechanism is in line with the empirical impulse responses of the yield in the United States shown in the second row of Figure 4. The contrary happens for bonds issues by EMEs, which are not generally valued for their safety attributes. In particular, the difference in the perceived riskiness between EME sovereign bonds and US Treasuries increases more significantly at short maturities than at longer ones (Fig. 9). This pattern is expected, as sovereign defaults in EME typically occur during crisis episodes, which are temporary. Consequently, during such periods, the default risk rises

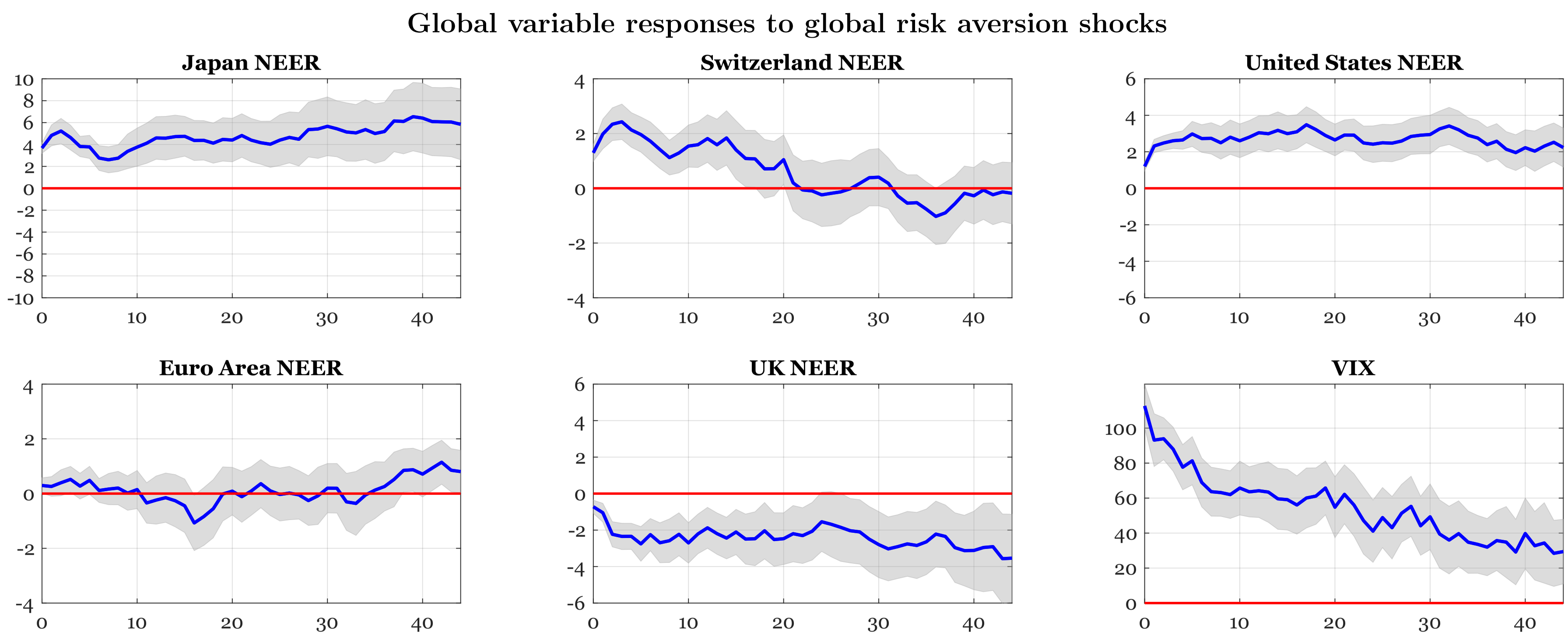

Figure 3: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

Yield responses to global risk aversion shocks

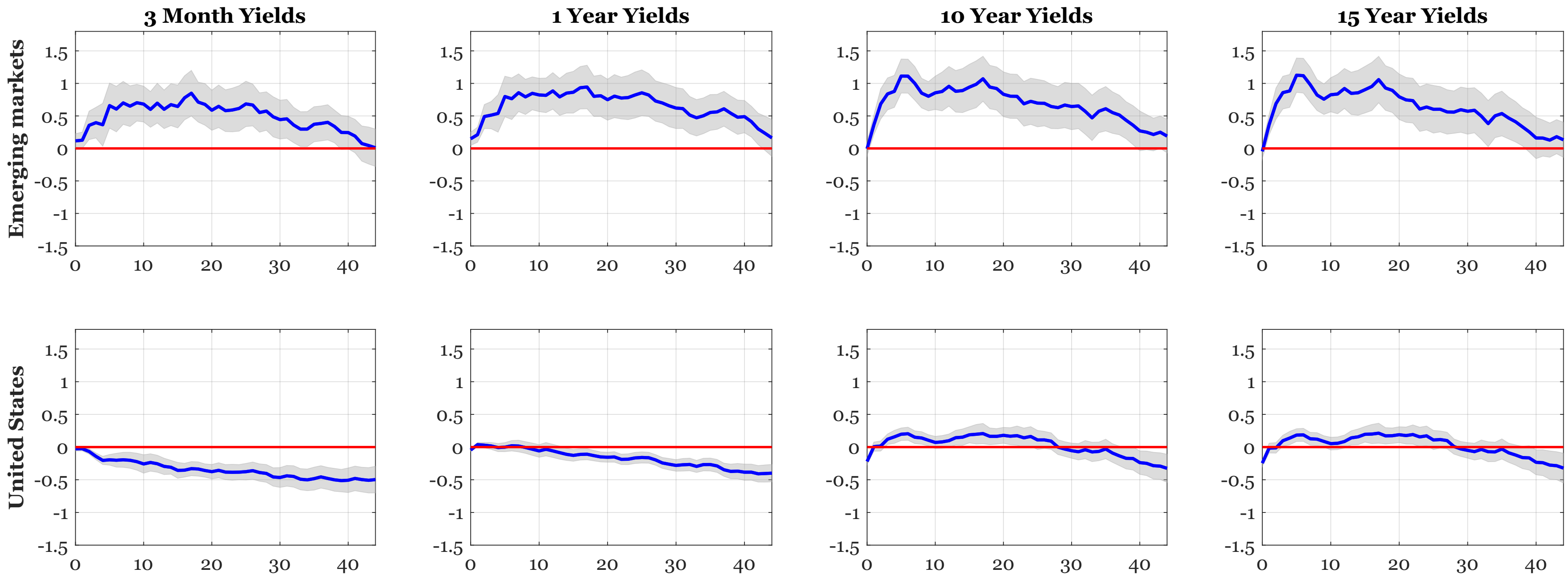

Figure 4: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

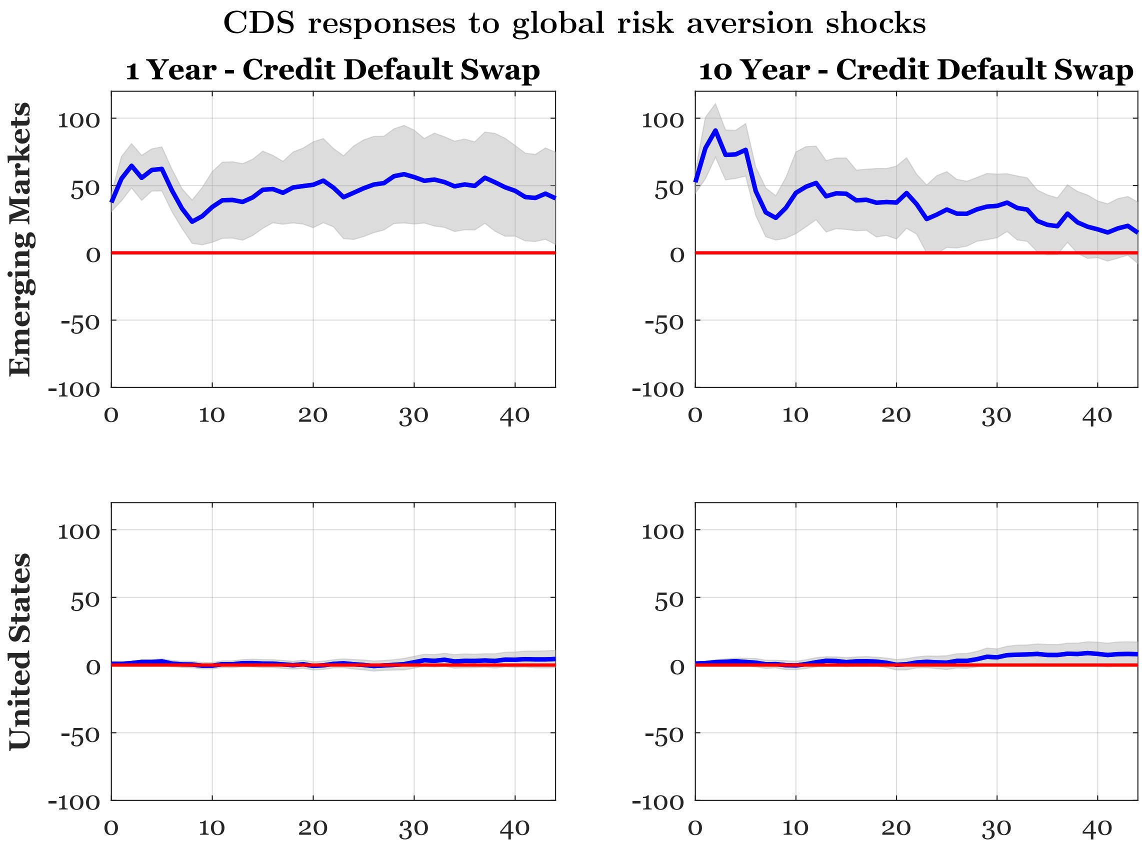

Figure 5: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

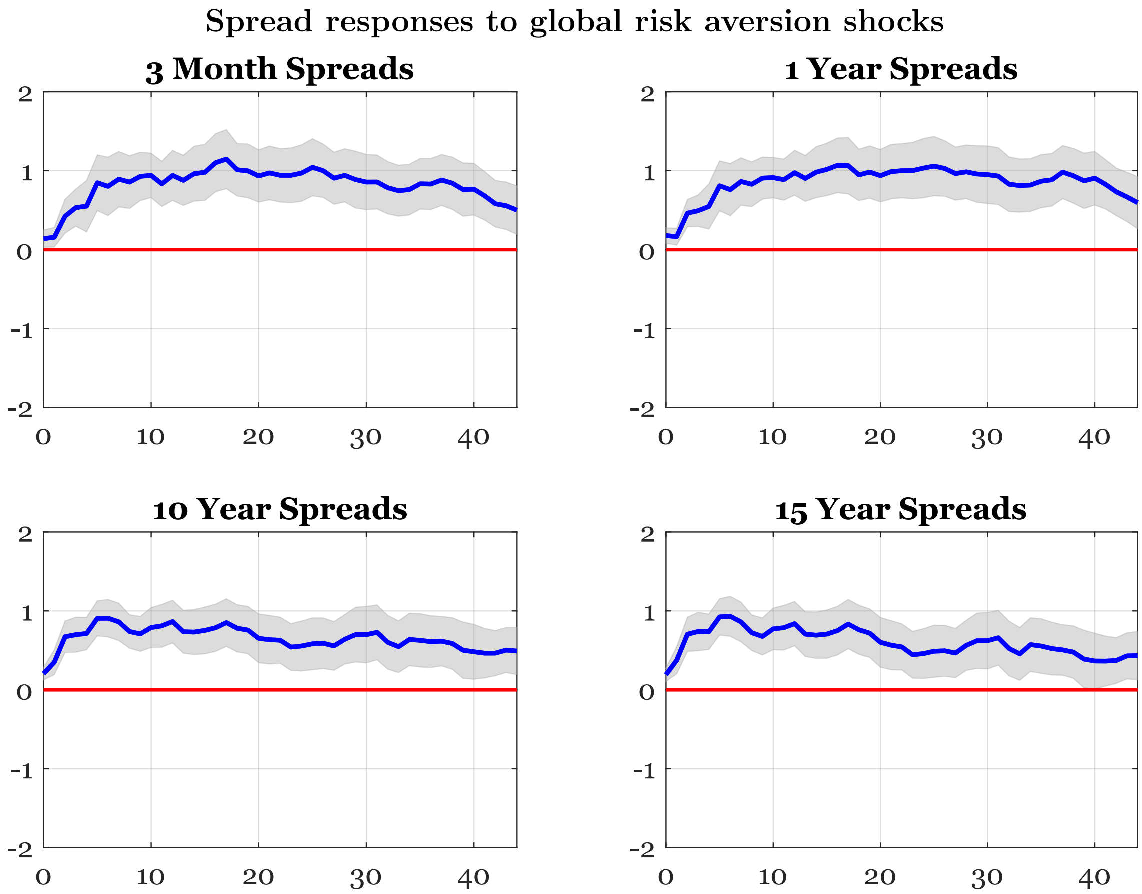

Figure 6: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

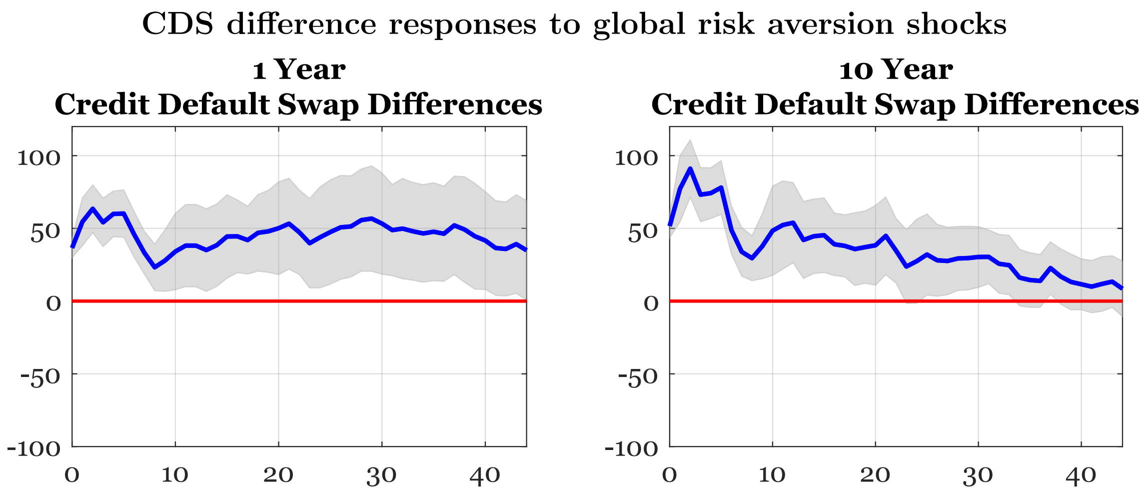

Figure 7: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

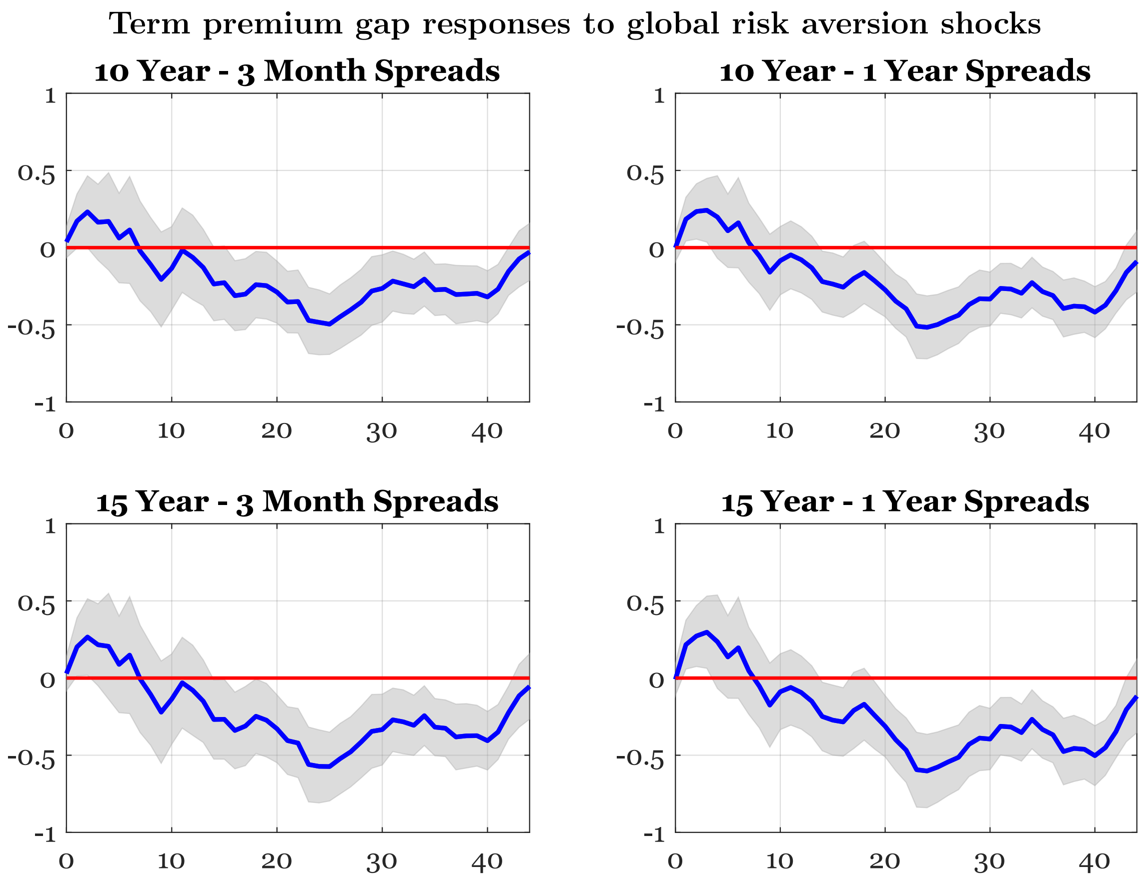

Figure 8: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; dark gray area: 68% confidence intervals; light gray area: 90% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

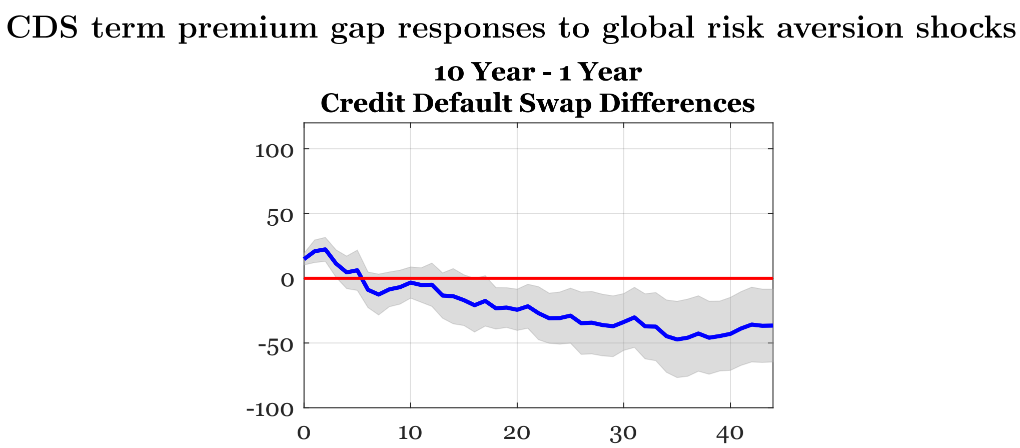

Figure 9: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

predominantly at shorter maturities. Our proposed mechanism abstracts from supply side considerations, whereby governments in emerging markets choose the optimal maturity structure of sovereign debt, facing either a trade-off connected to the incentive benefits of issuing short-term debt and the hedging benefits of long-term one (e.g. Arellano and Ramanarayanan, 2012, see Appendix C); or risk averse investors that request an higher premium on long-term bonds during risk-off episodes (e.g. Broner et al., 2013).

5 Robustness

We now study the validity of our results to alternative global risk aversion estimates. First, we investigate the response of our key variables to the global risk aversion estimate provided by Bekaert et al. (2021) that we fed into the LP model (equation 5). The series is constructed as a linear function of a set of observable financial variables, at the daily frequency.[15] Second, we estimate the response of the term premium gap to the risk-on, risk-off measure capturing default risk in the US corporate sector (RORO - credit spreads; Chari et al., 2023), as funding shock in the United States display substantial impacts to emerging market financial variables (e.g. Chari, 2023; among others).[16] Similarly to the baseline estimation, these alternative estimates of global risk aversion shocks determine a drop in the term premium gap (Fig. 10 and 11).

Third, we analyze the responses of the term premium gap to the 5th and 95th percentile estimates of our baseline risk aversion series (Figure 12) by using them in the LP model (equation 5).[17] Reassuringly, in both cases risk aversion shocks induce a significant decrease in the term premium gap across all set of maturities (Figure 13). These results alleviate the concerns of a generated regressor bias, due the uncertainty involved in the risk aversion estimation (equation 1), in our findings. Consistently, we show that our baseline results are virtually unchanged even upon selecting extreme values of the risk aversion distribution.

In addition, in Appendix B we show that our results are robust to controlling for:

[15] Bekaert et al. (2021) build a dynamic asset-pricing model, featuring time-varying risk aversion and economic uncertainty. Then, via a model-based approach, the authors construct a series of time-varying risk aversion as a linear function of key financial variables, such as credit spreads and equity risk-neutral variances.

[16] The RORO index comprises the z-score of the first principal component of daily changes in several standardized variables, such as: US High Yield Index Option-Adjusted Spread, and Euro High Yield Index Option-Adjusted Spread US BAA - 10Y.

[17] We obtain the 5th and 95th percentile estimates of our risk aversion series in two steps. First, we estimate the 5th- and 95th-percentile predicted variance of returns of the S&P 500 over a monthly horizon – $\widehat{RV_t^{5pct}}$ and $\widehat{RV_t^{95pct}}$, respectively – in eq. (1). Second, we implement these estimates in eq. (2), thus obtaining the 5th- and 95th-percentile risk aversion measures, as $RA_t^{5pct} = VIX_t^2 - \widehat{RV_{t+22}^{95pct}}$ and $RA_t^{95pct} = VIX_t^2 - \widehat{RV_{t+22}^{5pct}}$.

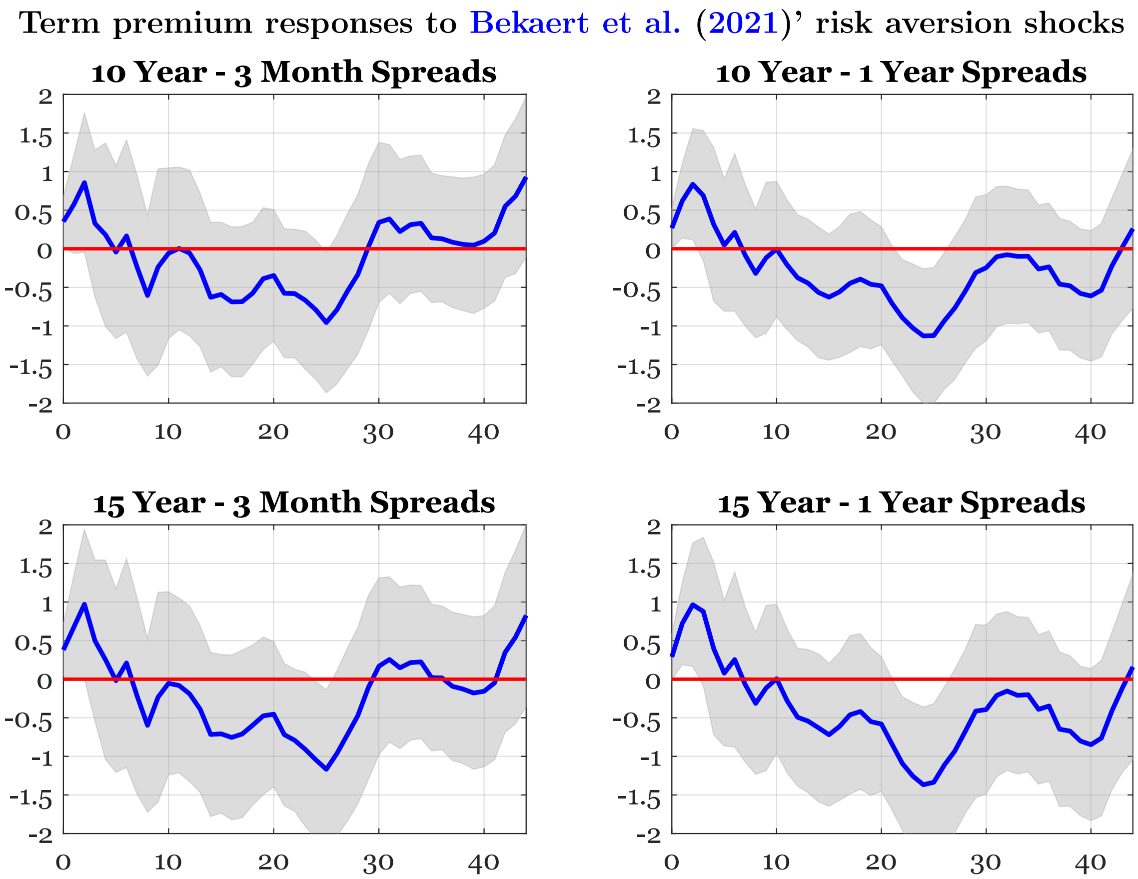

Figure 10: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). The global risk aversion series is retrieved from Bekaert et al. (2021). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

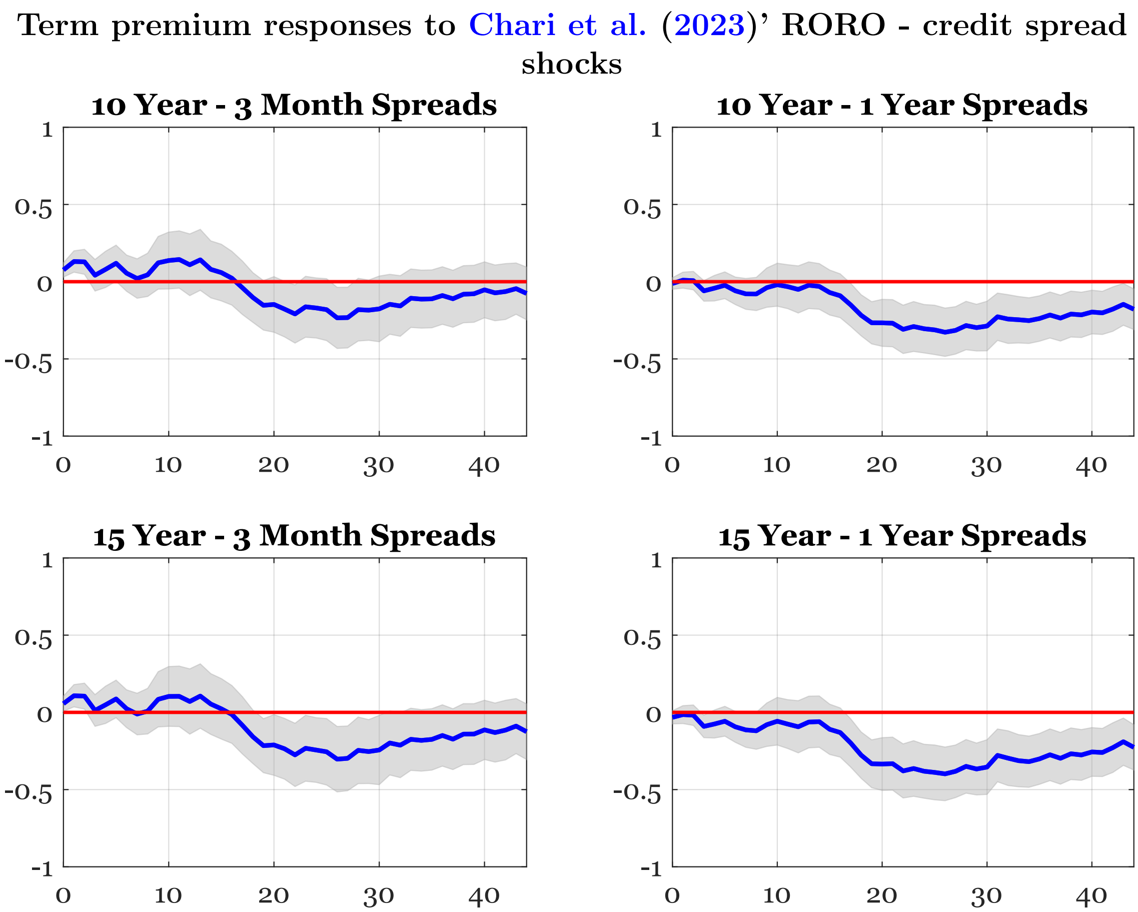

Figure 11: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). The global risk aversion series is retrieved from Chari et al. (2023). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

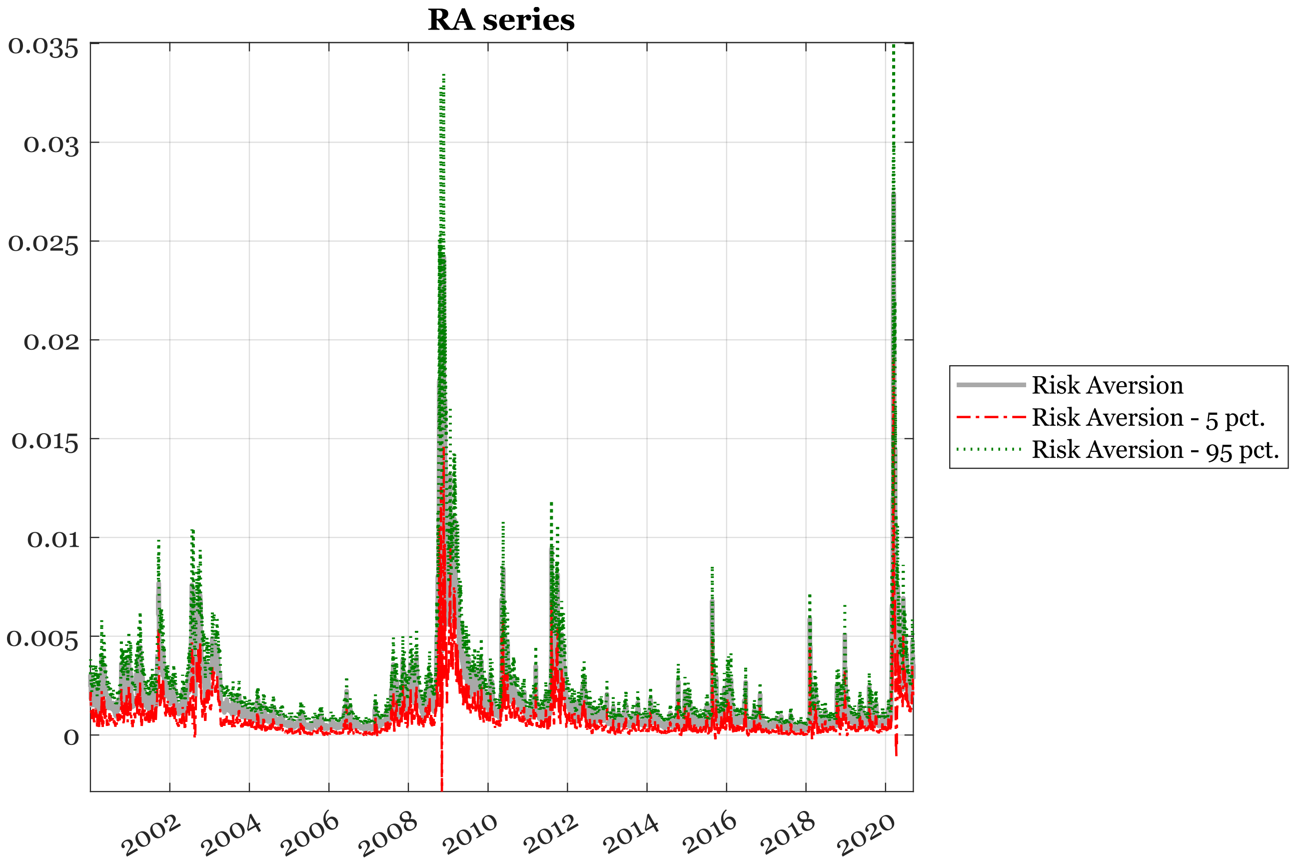

Figure 12: Daily global risk aversion series are expressed in percent.

US monetary policy (Figure B.1); and for extreme events, such as the Global Financial Crisis (GFC) and the Covid-19 pandemic period, with a dummy variable (Figure B.2).[18] Finally, in Appendix D, we study the connection of our results to the extant literature, by investigating their validity in the time-span and set of countries considered by Broner et al. (2013).[19]

6 Conclusions

In this analysis we show that an exogenous increase in risk aversion, which plausibly occurs during financial crises, affects sovereign spreads between EMEs and US yields differently across maturities, in particular with a stronger rise in spreads at short-term maturities. We document that our results are consistent with the stronger deterioration in the creditworthiness of short-term sovereign bonds in EMEs with respect to the US.

Our results contribute to the literature related to the impact of global risk aversion

[18] In particular, we use a dummy variable that is equal to 1 during both the GFC (June 2007 - June 2009) and the Covid related crisis (February 2020 - end of our sample); and zero otherwise.

[19] We kindly acknowledge the authors for sharing their data and codes.

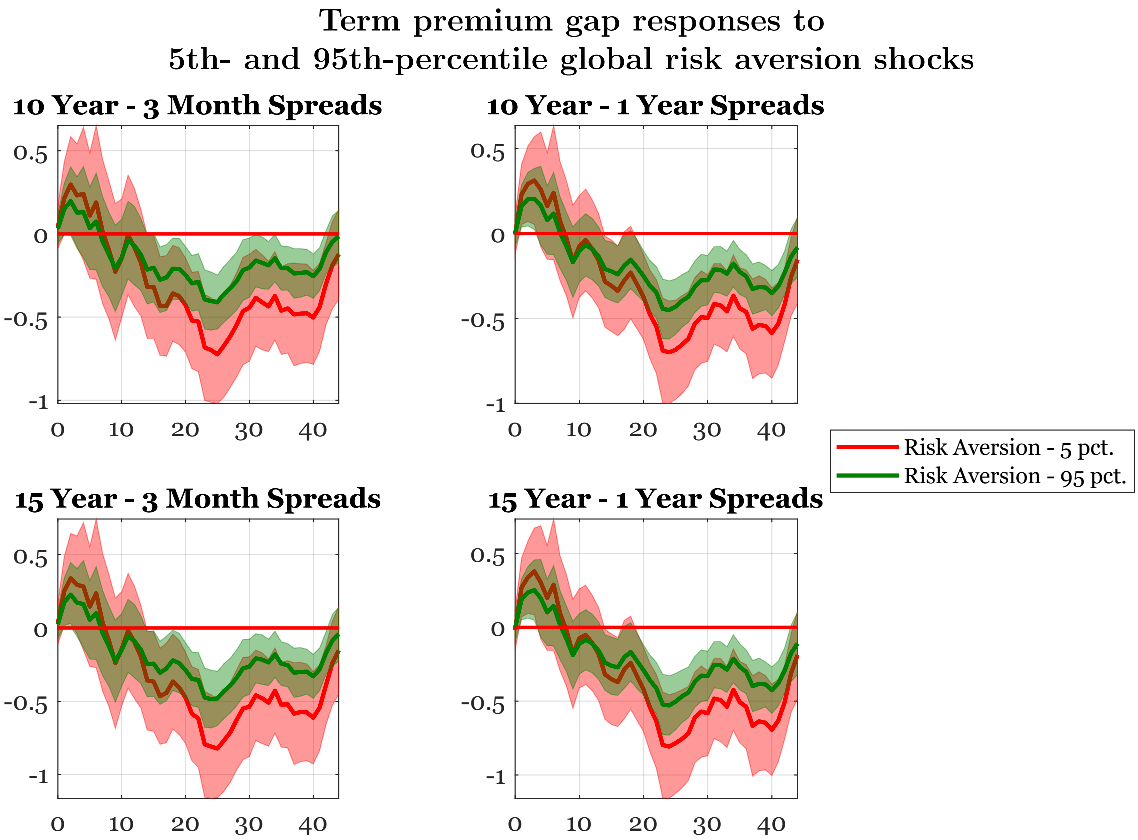

Figure 13: Impulse response functions to global risk aversion shocks that increase the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; shaded areas: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

shocks on sovereign spreads in EMEs, by taking directly into account the whole term structure of spreads and pointing out that their effects may differ substantially across maturities. Therefore, our findings provide additional insights to inform policy makers' assessment regarding the relationship between global risk aversion and sovereign spreads in EMEs. A future avenue for research would be the study of transmission of risk aversion shocks on the term structure of EME bonds issued in local currency (e.g. Du and Schreger, 2016, Du et al., 2020).

Bibliography

Ahmed, R. (2023). Flights-to-safety and macroeconomic adjustment in emerging markets: The role of us monetary policy. *Journal of International Money and Finance*, 133:102827.

Akinci, O. (2013). Global Financial Conditions, Country Spreads and Macroeconomic Fluctuations in Emerging Countries. *Journal of International Economics*, 91(2):358–371.

Arellano, C. and Ramanarayanan, A. (2012). Default and maturity structure in sovereign bonds. *Journal of Political Economy*, 120(21):187–232.

Barndorff-Nielsen, O., Hansen, P. R., Lunde, A., and Shephard, N. (2008). Designing Realized Kernels to Measure the ex post Variation of Equity Prices in the Presence of Noise. *Econometrica*, 76(6):1481–1536.

Bekaert, G., Engstrom, E. C., and Xu, N. R. (2021). The Time Variation in Risk Appetite and Uncertainty. *Management Science*.

Bekaert, G. and Hoerova, M. (2014). The VIX, the Variance Premium and Stock Market Volatility. *Journal of Econometrics*, 183(2):181–192.

Bekaert, G., Hoerova, M., and Lo Duca, M. (2013). Risk, uncertainty and monetary policy. *Journal of Monetary Economics*, 60(7):771–788.

Bellas, D., Papaioannou, M. G., and Petrova, I. (2010). Determinants of Emerging Market Sovereign Bond Spreads: Fundamentals vs Financial Stress. *IMF Working Paper Series*.

Bertaut, C. C., Bruno, V., and Shin, H. S. (2023). Original sin redux: role of duration risk. *BIS Working Papers*, 1109.

Berthold, B. (2023). The macroeconomic effects of uncertainty and risk aversion shocks. *European Economic Review*, 154:104442.

Bollerslev, T., Tauchen, G., and Zhou, H. (2009). Expected stock returns and variance risk premia. *The Review of Financial Studies*, 22(11):4463–4492.

Broner, F., Lorenzoni, G., and Schmukler, S. (2013). Why Do Emerging Economies Borrow Short Term? *Journal of the European Economic Association*, 11(S1):67–100.

Bruno, V. and Shin, H. S. (2015a). Capital flows and the Risk-Taking Channel of Monetary Policy. *Journal of Monetary Economics*, 71:119–132.

Bruno, V. and Shin, H. S. (2015b). Cross-Border Banking and Global Liquidity. *Review of Economic Studies*, 82(2):535–564.

Caldara, D. and Iacoviello, M. (2022). Measuring geopolitical risk. *American Economic Review*, 112(4):1194–1225.

Carr, P. and Wu, L. (2009). Variance Risk Premiums. *Review of Financial Studies*, 22(3):1311–1341.

Cascaldi-Garcia, D., Sarisoy, C., Londono, J. M., Sun, B., Datta, D. D., Ferreira, T., Grishchenko, O., Jahan-Parvar, M. R., Loria, F., Ma, S., et al. (2023). What is certain about uncertainty? *Journal of Economic Literature*, 61(2):624–654.

Cecchetti, S. and Di Cesare, A. (2012). The mathematics of the relationship between the default risk and yield-to-maturity of coupon bonds. *arXiv preprint arXiv:1203.6723*.

Chari, A. (2023). Global risk, non-bank financial intermediation, and emerging market vulnerabilities. *Annual Review of Economics*, 15:549–572.

Chari, A., Stedman, K. D., and Lundblad, C. (2023). Risk-on risk-off: A multifaceted approach to measuring global investor risk aversion. Technical report, National Bureau of Economic Research.

Corsetti, G., Lloyd, S., Marin, E., and Ostry, D. (2023). Us risk and treasury convenience. Technical report, Working paper.

Csonto, B. and Ivaschenko, I. (2013). Determinants of Sovereign Bond Spreads in Emerging Markets: Local Fundamentals and Global Factors vs. Ever-Changing Misalignments. *IMF Working Paper Series*, (164).

Diebold, F. and Li, C. (2006). Forecasting the Term Structure of Government Bond Yields. *Journal of Econometrics*, 130(2):337—-364.

Driscoll, J. and Kraay, A. C. (1980). Consistent Covariance Matrix Estimation with Spatially Dependent Data. *Review of Economics and Statistics*, 80:541–560.

Du, W., Im, J., and Schreger, J. (2018). The US treasury premium. *Journal of International Economics*, 112:167–181.

Du, W., Pflueger, C. E., and Schreger, J. (2020). Sovereign debt portfolios, bond risks, and the credibility of monetary policy. *The Journal of Finance*, 75(6):3097–3138.

Du, W. and Schreger, J. (2016). Local Currency Sovereign Risk. *Journal of Finance*, 71(3):1027–1069.

Edwards, S. (1984). LDC foreign borrowing and default risk: An empirical investigation, 1976-80. *The American Economic Review*, 74(4):726–734.

Garcia-Herrero, A., Ortiz, A., and Cowan, K. (2006). The role of global risk aversion in explaining sovereign spreads. *Economia*, 7(1):125–155.

Georgiadis, G., Müller, G. J., and Schumann, B. (2024). Global risk and the dollar. *Journal of Monetary Economics*, 144:103549.

Gertler, M. and Karadi, P. (2015). Monetary Policy Surprises, Credit Costs, and Economic Activity. *American Economic Journal: Macroeconomics*, 7(1):44–76.

González-Rozada, M. and Yeyati, E. L. (2008). Global Factors and Emerging Market Spreads. *The Economic Journal*, 118(533):1917–1936.

Greenwood, R., Hanson, S. G., and Stein, J. C. (2015). A comparative-advantage approach to government debt maturity. *The Journal of Finance*, 70(4):1683–1722.

Heber, G., Lunde, A., Shephard, N., and Sheppard, K. (2009). Oxford-Man Institute's Realized Library, version 0.3.

Hofmann, B., Shim, I., and Shin, H. S. (2020). Bond Risk Premia and the Exchange Rate. *Journal of Money, Credit and Banking*, 52(S2):497–520.

Jarociński, M. and Karadi, P. (2020). Deconstructing monetary policy surprises—the role of information shocks. *American Economic Journal: Macroeconomics*, 12(2):1–43.

Jordà, Ò. (2005). Estimation and Inference of Impulse Responses by Local Projections. *American economic review*, 95(1):161–182.

Kennedy, M. and Palerm, A. (2014). Emerging Market Bond Spreads: The Role of Global and Domestic Factors from 2002 to 2011. *Journal of International Money and Finance*, 43:70–87.

Krishnamurthy, A. and Vissing-Jorgensen, A. (2012). The aggregate demand for treasury debt. *Journal of Political Economy*, 120(2):233–267.

Longstaff, F. A., Pan, J., Pedersen, L. H., and Singleton, K. J. (2011). How Sovereign is Sovereign Credit Risk? *American Economic Journal: Macroeconomics*, 3(2):75–103.

Micic, K. (2017). Recent trends in EME government debt volume and composition. *BIS Quarterly Review*.

Miranda-Agrippino, S. and Rey, H. (2020). US Monetary Policy and The Global Financial Cycle. *The Review of Economic Studies*, 87(6):2754–2776.

Miranda-Agrippino, S. and Rey, H. (2022). The global financial cycle. In *Handbook of international economics*, volume 6, pages 1–43. Elsevier.

Miranda-Agrippino, S. and Ricco, G. (2021). The Transmission of Monetary Policy Shocks. *American Economic Journal: Macroeconomics*, 13(3):74–107.

Nelson, C. R. and Siegel, A. F. (1987). Parsimonious Modeling of Yield Curves. *Journal of business*, pages 473–489.

OECD (2022). Sovereign debt issuance trends in emerging-market economies. *OECD Sovereign Borrowing Outlook 2022*.

Onen, M., Shin, H. S., and Von Peter, G. (2023). Overcoming original sin: insights from a new dataset.

Rosenberg, J. V. and Engle, R. F. (2002). Empirical pricing kernels. *Journal of Financial Economics*, 64(3):341–372.

Uribe, M. and Yue, V. Z. (2006). Country spreads and emerging countries: Who drives whom? *Journal of International Economics*, 69(1):6–36.

Wright, J. H. (2012). What does Monetary Policy do to Long-term Interest Rates at the Zero Lower Bound? *The Economic Journal*, 122(564):F447–F466.

Appendix

A Data

Yields

Countries	Start	End	Observed maturities
Brazil	30-Jun-1998	13-Oct-2020	3 and 6 months; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 15 years.
Colombia	30-Jun-1998	13-Oct-2020	3 and 6 months; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 15 years.
Mexico	30-Jun-1998	13-Oct-2020	3 and 6 months; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 15 years.
South Korea	30-Jun-1998	13-Oct-2020	3 and 6 months; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 15 years.
Turkey	17-Jan-2003	13-Oct-2020	3 and 6 months; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 15 years.
US	29-Dec-1994	13-Oct-2020	3 and 6 months; 1, 8, 9, 10, and 30 years.

Table A.1: Data source: Bloomberg, zero-coupon yield curves related to sovereign securities issued in USD.

Credit Default Swap Spreads

Countries	Start	End	Observed maturities
Brazil	31-Dec-2004	13-Oct-2020	1 year, and 10 years.
Colombia	31-Dec-2004	13-Oct-2020	1 year, and 10 years.
Mexico	31-Dec-2004	13-Oct-2020	1 year, and 10 years.
South Korea	31-Dec-2004	13-Oct-2020	1 year, and 10 years.
Turkey	20-Nov-2006	13-Oct-2020	1 year, and 10 years.
US	20-Apr-2006 and 19-Jun-2006, respectively	13-Oct-2020	1 year, and 10 years.

Table A.2: Data source: Thomson-Reuters Datastream database, credit default swap spreads related to sovereign bonds issued in USD.

Debt issuance

Countries	Start	End	Observed maturities	Number of issuance days
Brazil	30-Jun-1998	13-Oct-2020	3 to 30 years	44
Colombia	30-Jun-1998	13-Oct-2020	2to 30 years	58
Mexico	30-Jun-1998	13-Oct-2020	1 to 100 years	74
South Korea	30-Jun-1998	13-Oct-2020	5 to 30 years	12
Turkey	17-Jan-2003	13-Oct-2020	1 to 30 years	107

Table A.3: Data source: LSEG Data & Analytics, dataset Government and Corporate Bonds

Stock market and bilateral exchange rate data

Countries	Stock market price index	Exchange rate
Brazil	2/01/90 - 13/10/20	10/10/94 - 13/10/20
Colombia	31/12/92 - 13/10/20	27/11/91 - 13/10/20
Mexico	2/01/90 - 13/10/20	11/10/94 - 13/10/20
South Korea	2/01/90 - 13/10/20	2/01/90 - 13/10/20
Turkey	2/01/90 - 13/10/20	2/01/90 - 13/10/20

Table A.4: Exchange rate refers to the bilateral nominal exchange rate with USD: $\frac{\#LC}{1USD}$. Stock market price index refers to the MSCI (Morgan Stanley Capital International) domestic stock market price index, denominated in USD. Data source: Thomson-Reuters Datastream database.

Additional variables

Variable	Description	Time Span	Source
Oil price	Cushing OK WTI Spt Price FOB U$/BBL	02/01/90 - 13/10/20	Datasetream
VIX	CBOE S&P 500 Volatility Index	02/01/90 - 13/10/20	FRED
GPR	Geopolitical Risk series (7-day moving average)	01/01/85 - 05/02/24	Caldara and Iacoviello (2022)
MP	US monetary policy shocks	08/02/90 - 19/06/19	Jarociński and Karadi (2020)
US 1-year yield	US Treasury 1-year government bond yield	02/01/90 - 13/10/20	FRED
CP	Commodity Price Indicator	02/01/90 - 10/09/24	Datastream
United States NEER	US nominal effective exchange rate	11/04/96 - 13/10/20	Datastream
Japan NEER	Japan nominal effective exchange rate	11/04/96 - 13/10/20	Datastream
Switzerland NEER	Switzerland nominal effective exchange rate	11/04/96 - 13/10/20	Datastream
Euro Area NEER	EA nominal effective exchange rate	11/04/96 - 13/10/20	Datastream
United Kingdom NEER	UK nominal effective exchange rate	11/04/96 - 13/10/20	Datastream
RV	Realized kernel variance (non-flat parzen) of S&P 500	03/01/00 - 13/10/20	Heber et al. (2009)
RA a lá Bekaert et al. (2021)	Risk aversion	02/01/90 - 13/10/20	Bekaert et al. (2021)
RORO spreads	Risk-ON Risk-OFF index	09/05/03 - 13/10/20	Chari et al. (2023)

Table A.5: The acronyms correspond to the following sources. Datastream: Thomson-Reuters Datastream database; FRED: Federal Reserve Economic Data. Heber et al. (2009) extends their dataset until July 2021 (current library version: 0.3).

B Additional figures

Term premium gap responses to global risk aversion shocks, controlling for US monetary policy high-frequency instrument (Jarociński and Karadi, 2020)

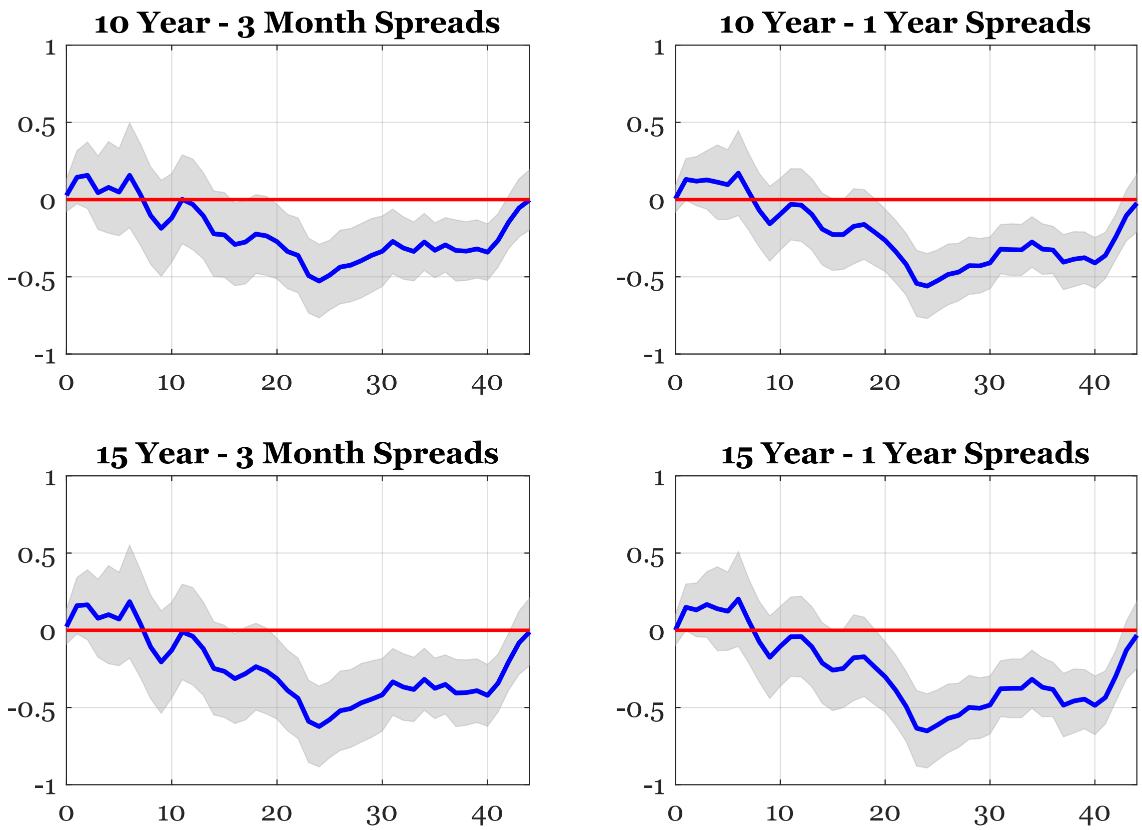

Figure B.1: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

Term premium gap responses to global risk aversion shocks, controlling for a the GFC and the Covid crisis with a dummy

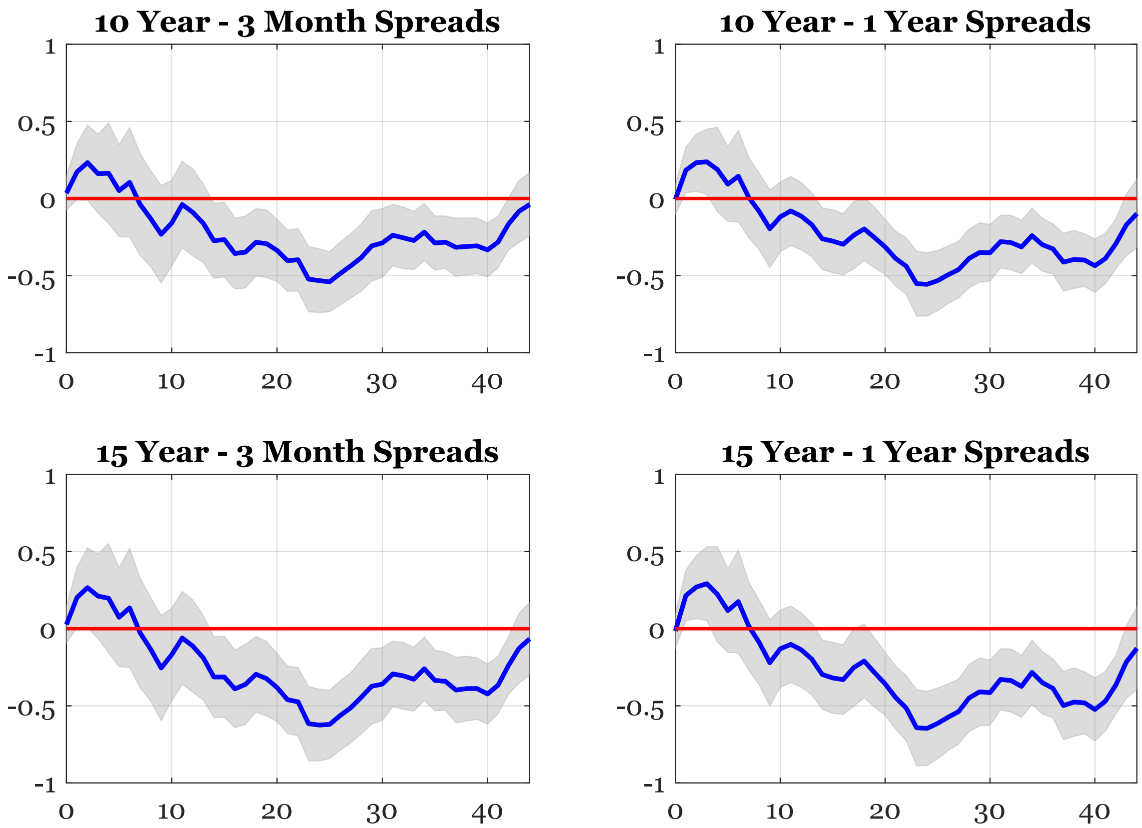

Figure B.2: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows business days after the shock. Unit of measure: percentage points.

C A model to rationalize the results

We now present a simple three-period model to illustrate the supply-side mechanisms described in Section 4. Let us define the periods $t = 0, 1, 2$ – with 1 and 2 being the short- and the long-term, respectively. The model economy features two agents: the borrower, i.e. the government, and lenders, which are perfectly competitive. The government can issue one-period bonds in periods 0 and 1 (b_0^1 and b_1^1, respectively) and a two-period zero-coupon bond in period 0 (b_0^2). The lender can impose a punishment to the borrower in the event of an explicit default. The model has two endogenous states, i.e. the stocks of each type of debt, b_0 and b_1, and an exogenous state, the income of the economy, y_t.The borrower chooses the optimal amount of debt, b_0 and b_1, to maximize utility. She takes as given that each contract carries specific prices that are contingent on today's state. The choice to stay in the credit contract or to default is made each period, meaning the expected value from the next period onward reflects the possibility of defaulting in the future.

Our model slightly differs from the one by Arellano and Ramanarayanan (2012) (AR, henceforth), in that default can occur in period 1 instead of period 2. In period 0, there are two states, indexed by p and g. Income in period 0 is equal to y_0, regardless of the state. Income in period 1 is equal to $y = y_1^H$ with probability p, whereas $y = y_1^L < y_1^H$ otherwise. In state g, the probability of getting y_1^H is g. Consumption in the event of a default is equal to $y^{def} > 0$. In period 2 income is always equal to y_2.

Focusing on the supply side of bonds, the borrower utility function reads as follows:

$$U(c_0, c_1, c_2) = E_0 \left[\log c_0 + \beta \log c_1 + \beta^2 \log c_2 \right], \tag{C.1}$$

where $\beta < 1$ is the borrower's discount factor. The risk-free rate is $r^* = 0$ and can be interpreted as the steady-state safe (US) interest rate. The incentive benefits of short-term debt can be diminished if lenders could impose a punishment for deviating from a given debt policy or enrich the debt contracts with future debt limits. We closely follow the approach of AR and assume that in the economy the endowments and the default punishment satisfy the following inequality:

$$\frac{\beta^2}{R} W \left(y_o, y_1^H, y_2 \right) - \left(y_1^H - y_1^L \right) < y^{def} \leq \frac{\beta^2}{R} W \left(y_o, y_1^H, y_2 \right), \tag{C.2}$$

where

$$W \left(y_o, y_1^H, y_2 \right) = y_0 + \pi y_1^H + y_2 \quad \text{with } \pi\text{=p,g},$$

and

$$R = 1 + \pi\beta + \beta^2.$$

The variable W represents the market value of the borrower's income across all possible states, with the exception of $y_1 = y_1^L$. Given these conditions, the equilibrium outcome is as follows: the borrower defaults in period 1 if income is y_1^L; in all other states, repayment occurs. The default punishment in equation (C.2) leads to a reduction in the incentive benefit of short-term debt. The default patterns imply that bond prices are $q_0^1 = \pi$, $q_0^2 = 1$. Short-term bonds are issued in period 1 only in case of no-default. Therefore, their price is equal to $q_1^1 = 1$. The budget constraints of the borrower is: in period 0, $c_0 = y_0 + \pi b_0^1 + b_0^2$,with $\pi = p, g$; in period 1, $c_1 = y_1^H - b_0^1 + b_1^1$; in period 2, $c_2 = y_2 - b_0^2 - b_1^1$.[20]

From the optimality conditions, the optimal level of short-term borrowing in period 1 is equal to:

$$b_0^1 = y_1^H + b_1^1 - \frac{\beta}{\pi} c_0. \tag{C.3}$$

[20] In our setup y^{def} is not a choice variable for the borrower, as in Arellano and Ramanarayanan (2012). Also note that the implications of the model hold regardless of the calibration of p and g.

Consider that π is the probability of not making default. The derivative of short-term borrowing in period 0 with respect to the non-default probability is equal to:

$$\frac{\partial b_0^1}{\partial \pi} = \frac{\beta}{\pi^2} c_0. \tag{C.4}$$

An increase in global risk aversion, which leads to a financial turmoil in the short-run, clearly lowers π, reducing the issuance of short-term debt. The optimization of borrower's utility subject to her budget constraint implies that the optimality condition for long-term debt is:

$$b_0^2 = y_2 - b_1^1 - \frac{\beta^2}{\pi} c_0, \tag{C.5}$$

and the derivative of long-term borrowing in period 0 with respect to the non-default probability is given by:

$$\frac{\partial b_0^2}{\partial \pi} = \frac{\beta^2}{\pi^2} c_0. \tag{C.6}$$

It is immediate to see that $\frac{\partial b_0^1}{\partial \pi} > \frac{\partial b_0^2}{\partial \pi}$. In other words, short-term borrowing is more sensitive to a change in the default probability than long-term debt. In particular, an increase in global risk aversion, a lower π, implies that the borrower finds it optimal to reduce the amount of short-term bonds more than that of long-term bonds. At the same time, the price of short-term bonds, q_0^1, falls leading to a higher yield – and spread with respect to the safe-asset interest rate $r^* = 0$– consistently with the empirical results reported in Figure 4 and 6.

D Bridge with the literature

We finally investigate the connection between our results and the extant literature on risk aversion shocks and term premium gaps. We do so by focusing on Broner et al. (2013), whose methodology is closer to ours. The authors consider debt issued by EMEs in foreign currency and show opposite results: an exogenous increase of risk aversion determines a rise in the relative cost of issuing long term debt in EMEs, compared to safe advanced economies. We depart from their analysis along several dimensions, the most relevant of which are: the definition of term premium gap and of risk aversion shocks;[21] the time-span and set of countries considered into the analysis;[22] the risk-free

[21] We estimate the response of yields, spreads and term premium gaps of EME sovereign debt to *global* risk aversion shocks, rather than financial crisis *specific* to EMEs.

[22] Broner et al. (2013) implement their study over the period 1990 − 2009, and consider eleven emerging market economies: Argentina, Brazil, Colombia, Hungary, Mexico, Poland, Russia, South Africa, Turkey,

asset benchmark, as the authors use sovereign EME bonds issued in both USD and Deutsche mark or euro (according to the period of issuance); and the demand and supply side effects on EME sovereign bond yields, as the authors do not restrict their analysis on those dates in which EMEs do not issue sovereign bonds denominated in USD.

Therefore, a natural question arises: can one of these differences explain the opposite results? We show that it is indeed the case by focusing on the role of currency denomination. In addition, in order to make the analysis closer to Broner et al. (2013), we also consider those dates in which EMEs issue sovereign bonds.

We use the (weekly) dataset of Broner et al. (2013) and elaborate two distinct term premium gap measures related to bonds issued either in USD or in Deutsche mark/euro. In addition, to ease the comparison with our main findings, we also elaborate a weekly term premium gap estimate for our sample. Finally, we fed these measures in the following set of regressions:

$$\begin{aligned} \text{term}^{w,s,c}_{i,t+h,\tau_2-\tau_1} - \text{term}^{w,s,c}_{i,t-1,\tau_2-\tau_1} &= \alpha^{w,s,c}_{h,\tau_2-\tau_1} + \gamma^{w,s,c}_{i,h,\tau_2-\tau_1} + \beta^{w,s,c}_{h,\tau_2-\tau_1} RA_t + \Gamma^{w,s,c}_{h,\tau_2-\tau_1}(L) RA_{t-1} \\ &+ \Omega^{w,s,c}_{h,\tau_2-\tau_1}(L) \Delta\text{term}^{w,s,c}_{i,t-1,\tau_2-\tau_1} + B^{w,s,c}_{h,\tau_2-\tau_1} X_{i,t} \\ &+ C^{w,s,c}_{h,\tau_2-\tau_1}(L) X_{i,t-1} + v^{w,s,c}_{i,t+h,\tau_2-\tau_1}, \end{aligned} \tag{C.7}$$

where L is a lag polynomial of order 3, the variables are defined as in the previous sections; and our aim is to estimate $\beta^{w,s,c}_{h,\tau_2-\tau_1}$: the response of weekly, w, term premium gaps, related to bonds issued in currency, c, to the baseline risk aversion shock both in our sample, s, and in Broner et al. (2013)' one. Our main finding on the term premium gap is somewhat preserved in the sample of Broner et al. (2013) for bonds issued in USD, but not for those denominated in Deutsche mark or euro. In fact, while the term premium gap decreases for bonds issued in USD both in our and in Broner et al. (2013)'s sample in response to risk aversion shocks (Figure C.1, first and second column, respectively); the one related to bonds issued in Deutsche mark or euro rises. This is not surprising, as US Treasury yields experience a time-varying premium, which increases during financial turmoils, over comparable government bonds issued by other safe advanced economies (Du et al., 2018). This, in turn, has induced a distinct development of the two risk-free benchmarks in the past decades, which plausibly explains the divergent results.

Uruguay, and Venezuela.

Term premium gap responses to global risk aversion shocks, weekly data

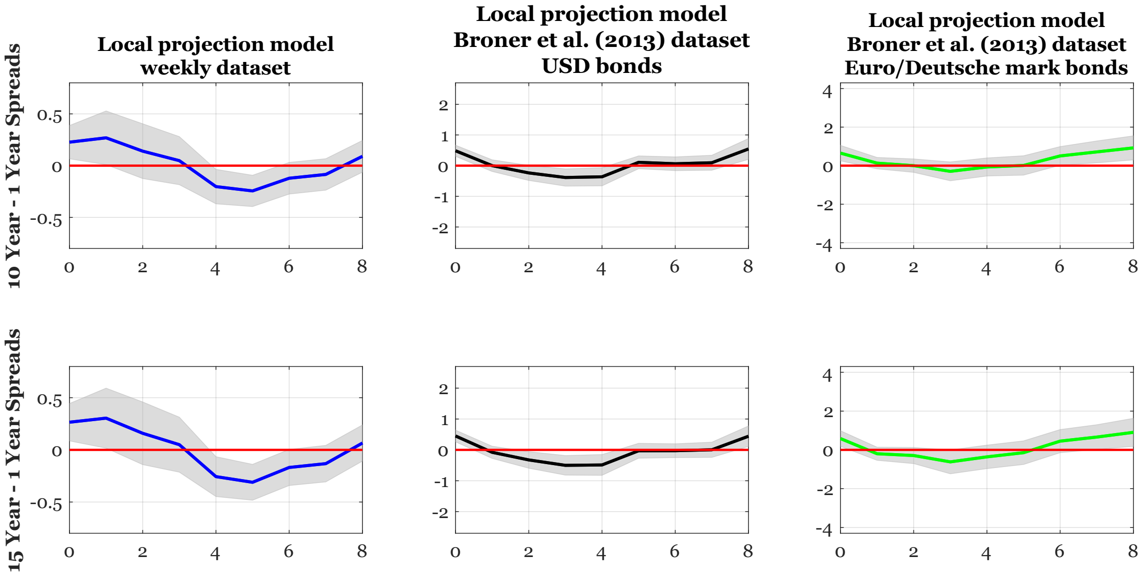

Figure C.1: Impulse response functions to a global risk aversion shock that increases the 1-year spread by 1 percentage point after 22 business days (one calendar month). Solid lines: point estimates; gray area: 68% confidence intervals. The x-axis shows weeks after the shock. Unit of measure: percentage points.