Emerging market corporate bond yields and monetary policy☆

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ABSTRACT

I examine spillover of monetary policy on corporate bond yields. Emerging market corporate bond yields are positively associated with the federal funds rate. However, this positive relation is transmitted through the domestic policy rate. If domestic policy rates are held constant, the spillover of US monetary policy on corporate bond yields diminishes. This suggests that domestic policymakers face a tradeoff: if they leave their policy rate unchanged when the Fed hikes, this may have benign consequences for corporate bond yields. However, a higher US policy rate may lead to exchange rate depreciation for emerging market currencies and thus elevated debt burdens for their US dollar debtors. Alternatively, if the Fed hikes and policymakers follow suit, funding conditions for corporates worsen through higher yields.

1. Introduction

Corporate debt in emerging market economies has been in the focus of many policymakers and academics recently (Acharya et al., 2015). Since the financial crisis, there has been a shift from bank lending to corporate bonds (Becker and Ivashina, 2014). Previously, researchers put a focus on the determinants of bank lending interest rates and relatively little attention has been paid to the pass-through of monetary policy on corporate bond yields. This is particularly true for the spillover effects of monetary policy on financing conditions of corporates in other countries. While bank lending interest rates are relatively unrelated to global conditions, there can be a spillover of global conditions on domestic corporate debt financing conditions through the capital markets.

This paper analyzes whether corporate bond yields in emerging market economies are related to US monetary policy and how US monetary policy transmits to corporate bond yields in emerging market economies. Rising financial globalization before the global financial crisis has renewed attention to a global financial cycle that determines economic and financial conditions globally (Bruno and Shin, 2015a; Rey, 2013). The trilemma in international economics emphasizes the impossibility of stable exchange rates, free capital movements and independent monetary policy concurrently (Obstfeld et al., 2005, 2010). Recently, this has been questioned by Rey (2013). She argues that the global financial cycle is the main determinant of global capital flows. Even if the exchange rate of a country is floating, it is exposed to cross-border capital flows that make its monetary policy dependent as cross-border capital flows will determine financial and economic conditions. The conclusion states that it is necessary to have a managed financial account to be insulated from the global financial cycle and to have an independent monetary policy. In addition, Rey argues that both the VIX and the federal funds rate are important determinants of the global financial cycle and global credit flows. She proposes that important central banks should pay attention to how their policy stance affects other economies. In the spirit of Rey, I show that US monetary policy can affect corporate bond yields in emerging market economies. However, it is also important to shed more light on the question if and how policymakers in emerging market economies can insulate themselves from global shocks and how important global shocks are to domestic funding conditions. My results show that emerging market central banks can prevent corporate bond

yields from being dependent of US monetary policy if their monetary policy is autonomous.

While research has focused on the effect of the global financial cycle on cross-border capital flows, evidence on the effect of the global financial cycle on corporate financing conditions has been rare. A sudden stop of cross-border capital inflows may lead to an external adjustment process but does not necessarily affect financing conditions in emerging markets when the cross-border flows are offset domestically. In contrast, asset prices can also be determined by the perception of demand and supply as well as self-fulfilling prophecies. These animal spirits can drive prices and therefore move funding conditions even if flows do not change. Accordingly, it is a key factor for financial stability to be aware of the spillover effects of monetary policy elsewhere on corporate bond yields.

As a consequence of the Fed's asset purchase program, investors have rebalanced their portfolios by replacing assets which were bought by the Fed with other assets (Bernanke, 2012). Many researchers focus on the global spill-over of the low global interest rates accompanied with the large-scale asset purchase programs in advanced economies. Burger et al. (2015) find that there has been a portfolio rebalancing towards emerging markets. In particular, the Fed's large-scale asset purchase program and low interest rates in the US have led to capital flight to emerging market economies. This rebalancing was driven by demand for higher-yielding bonds, such as those of corporates in emerging markets. In addition, emerging market corporates tend to issue US dollar debt in a low interest rate environment (McCauley et al., 2015). When the Fed announced that it will curtail its asset purchase program, there was a sudden retrenchment from the emerging market economies. This so-called Taper Tantrum has caused more attention to be paid to the question of how the US monetary policy affects funding conditions of emerging markets. Since then, the fear of hike in the federal funds rate has been prevalent in emerging markets.

Tighter US monetary policy might affect bond yields in the US, leading to a rebalancing back to US assets of the portfolios of investors that target a specific return. The portfolio rebalancing mechanism may have consequences for the prices and yields of emerging market economy assets. Tighter funding conditions can materialize once maturing assets need to be rolled over at higher yields.

There has been much emphasis on the trilemma of international economics as well as, more recently, on the global cycle and how it affects capital flows. To the best of my knowledge, there is no study that investigates the spillover of the monetary policy of the US on corporate funding conditions in emerging market economies including implications in terms of how policymakers can possibly prevent spill-over effects. I aim to fill this gap in the literature.

My empirical approach consists of three steps. First, I regress the country specific corporate bond yield on the domestic policy rate. Second, I substitute the domestic policy rate with the federal funds rate. Third, I regress the corporate bond yield on the domestic policy rate and the federal funds rate. My main specification also includes control variables and country fixed effects. The rationale behind this approach is the following: a regression of the corporate bond yield on the domestic policy rate, omitting the federal funds rate, shows the response of the corporate bond yield to the domestic policy rate unconditional on the US monetary policy stance. If the domestic policy rate of emerging market economies is following the federal funds rate as highlighted in Han and Wei (2014), I should not control for the domestic policy rate and only regress the corporate bond yield on the federal funds rate. If I omit the domestic policy rate, I allow the policy rate to float. Regressing the corporate bond yield on the federal funds rate clarifies how corporate bond yields react to the federal funds rate unconditional on the domestic policy rate. However, if the federal funds rate is changed and domestic policy rates follow suit, I can control for the policy rate in order to see how the federal funds rate affects the corporate bond yield, holding the domestic policy rate stable.

My results show that a higher federal funds rate in the US is associated with higher corporate bond yields in emerging market economies. However, this is not the case if policy rates in the domestic country stay unchanged. Therefore, the domestic monetary policy rate dominates the effect of the federal funds rate. A federal funds rate hike leads to an increase in the corporate bond yields of emerging market economies only if I allow the policy rate to follow the Fed. As soon as I control for the domestic policy rate, the effect diminishes and can be even negative. A higher federal funds rate is then associated with lower corporate bond yields.

This indicates the following tradeoff for emerging market economy policymakers: if the Fed changes its policy rate and emerging market policy rates follow suit, corporate bond yields increase and corporates in emerging markets face tighter funding conditions. This can jeopardize the economies of emerging markets and also affect the global economy through the global investor base in emerging market debt. Since corporates in emerging markets levered up massively since 2010, rollover risk can be significant once their debt securities mature. If domestic policymakers follow the Fed and increase their policy rates as well, this may lead to the above-described tighter funding conditions. In addition to the borrower side, the buy side in advanced economies may be affected when the yields of emerging market corporate debt securities rise and prices fall.

The alternative for emerging market policymakers is to leave their policy rate unchanged if the Fed hikes the policy target rate, which decreases the policy rate differential between the emerging market economies and the US. A change in the policy rate differential between two countries puts downward pressure on the currency with the relatively lower interest rates, and countries with floating exchange rates suffer a depreciation of their currency (Eichenbaum and Evans, 1995). While a depreciation of the domestic currency can boost exports and the economy in general, it has some dangerous implications for borrowers that face a currency mismatch in their balance sheets. Corporates in emerging market economies have increased their issuance of dollar debt massively since 2010 (McCauley et al., 2015). However, it is likely that the currency exposure is not fully hedged (Bleakley and Cowan, 2008; Bruno and Shin, 2015c; Schreger and Du, 2014). Hence, the currency mismatch increases the value of their net debt liabilities when the US dollar appreciates. Although most emerging markets have accumulated foreign exchange reserves in recent years, it will be a challenge to provide the corporate sector with US dollar reserves unless by lending to corporates that suffer a US dollar shortage directly.[1]

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[1] Aizenman et al. (2015, 2010) explain why economies may have built up exchange rate reserves recently and that countries with fewer reserves suffered higher currency depreciations during the Taper Tantrum.

This paper is organized as follows. Section 2 presents an overview of the data and provides summary statistics. Section 3 presents some stylized facts. In Section 4, I describe the methodology used. Section 5 presents results on the determinants of corporate bond yields. Section 6 concludes.

1.1. Related literature

There is a growing literature on the global financial cycle and how it affects capital flows. Miranda-Agrippino and Rey (2014) emphasize that US monetary policy is the main determinant of the global financial cycle, which in turn affects asset prices, capital flows and credit growth. Rey (2013) revises the Trilemma of international economics, proposed by Obstfeld et al. (2005), and concludes that the global financial cycle prevents countries to have independent monetary policy unless they have a managed capital account; this exposes countries to a dilemma between independent monetary policy and free capital flows. She emphasizes that it is not possible to have an independent monetary policy even if a country has a floating exchange rate because global conditions are transmitted to the economy through capital flows. Bruno and Shin present more evidence on the global financial cycle. In Bruno and Shin (2015b) they conclude that US monetary policy is the driving force behind banking capital flows. In Bruno and Shin (2015a) they emphasize that an interest rate spread between the local lending rate and the US federal funds rate leads to more banking capital inflows for the country with the higher interest rate. They also highlight the importance of the VIX as a global factor for banking capital flows. This is confirmed by Forbes and Warnock (2012) who study episodes of large gross capital flows. They also stress the importance of the VIX in explaining surge and stop periods in gross capital flows.

There is also a large literature on how US monetary policy affects economic and financial conditions (Cook and Hahn, 1989; Gertler and Karadi, 2015; Kuttner, 2001). Maćkowiak (2007) and Dedola and Rivolta (2015) investigate the spillovers on emerging markets in general. Eichengreen and Mody (2008) and Kamin and Von Kleist (1999) find a negative effect of the US interest rate on emerging market spreads. Chen et al. (2014, 2012) use a global vector error correction model and study the impact of a lower US corporate spread on emerging markets. They show that corporate bond yields in emerging market economies fell as a result of US quantitative easing.

McCauley et al. (2015) highlight that US dollar borrowing was driven by accommodative US monetary policy. In an environment of low global interest rates, there is an increased incentive to issue debt. When the risk-free yield is close to zero, investors substitute risk-free assets with riskier assets, which then again depresses their yields. For corporates in emerging markets, this situation has enabled them to borrow money for lower interest rates than before. Burger et al. (2015) show that favorable global factors led to relative portfolio rebalancing towards emerging market economies. This effect was amplified through the unconventional tools of the Fed. Fratzscher et al. (2013) present evidence that the large-scale asset purchase programs of the Fed have led to capital flows to emerging market economies.

Eichengreen et al. (2011) emphasize that important central banks should be aware of their spillover effects their actions have, and they should coordinate and internalize their spill-over effects. They also emphasize that spill-over effects can be larger in times of unconventional monetary policy.

Acharya et al. (2015) and Buttiglione et al. (2014) warn that high leverage in emerging market economies poses vulnerabilities. Chui et al. (2014) give an overview of the vulnerabilities that can arise with the increased leverage and currency mismatches of emerging market corporates. They warn that not only emerging market borrowers but also the holders of emerging market debt are vulnerable to turmoil in emerging markets. As emphasized by Shin (2013), many of the holders are asset managers in advanced economies. When prices start to drop, the large asset manager industry in the advanced economies can suffer as well.

Obstfeld (2015) and Klein and Shambaugh (2015) focus on the interest rate dependence of emerging market economies. Han and Wei (2014) show that if the Fed raises interest rates, most emerging markets follow.

Rey (2013), Bruno and Shin (2015b) and Eichenbaum and Evans (1995) show that a hike in the federal funds rate leads to an appreciation of the US dollar. This is not in line with the uncovered interest rate parity. However, this has been rationalized theoretically by Gabaix and Maggiori (2015) who show that capital inflows can drive exchange rates because investors in risky currencies require a currency risk premium. This result is confirmed empirically by Della Corte et al. (2015).

2. Data and summary statistics

The data is quarterly and spans from Q1 1999 until Q3 2014. The corporate bond yields are obtained from Oxford Economics and downloaded from Datastream. The bond yields are mainly collected from national sources. The bonds are denominated in local currency. The respective policy rates, the country specific 10- year generic bond yield, the consumer price index and GDP are from the IMF. I obtain the GDP growth and the inflation rate by taking the natural log difference of the GDP and the consumer price index. If the GDP is not available quarterly, I interpolate the annual value linearly. The VIX is from the Chicago Board Options Exchange and downloaded through Datastream. Peg is from the updated dataset of Shambaugh (2004). The capital openness data is from the updated dataset of Chinn and Ito (2006). Missing data is complemented with national sources. I follow Klein and Shambaugh (2015) for the choice of countries in the sample. The sample includes Argentina (AR), Brazil (BR), Chile (CL), Croatia (HR), Czech Republic (CZ), Hungary (HU), Indonesia (ID), Korea (KR), Malaysia (MY), Mexico (MX), Philippines (PH), Poland (PL), Russia (RU), Singapore (SG), South Africa (ZA), Thailand (TH), Turkey (TR), China (CN).

Table 1 provides summary statistics for the variables used in the paper. The average corporate bond yield in the sample is 10.3% with a median of 8.28%. While the corporate bond yield at the 25th percentile of the distribution is 5.76%, it is 12.6% at the 75th percentile of the distribution. The policy rate is smaller on average ranging from 3.74% to 9% from the 25th percentile to the 75th

Table 1
Summary statistics.

	N	Mean	Median	Q25	Q75	SD
Corporate bond yield	1137	10.3	8.28	5.76	12.6	6.69
Policy rate	1488	7.03	6.08	3.74	9	5.19
Fed funds rate	64	2.20	1.42	0.12	4.43	2.20
VIX	64	21.9	20.5	14.6	26.3	8.74
Peg	1428	0.14	0	0	0	0.35
Kaopen	1392	0.39	0.036	−1.19	1.35	1.32
ΔGDP	1437	1.06	1.09	0.68	1.52	0.77
π	1469	1.42	0.99	0.45	1.80	2.08
Gov bond yield	1039	7.23	6.24	3.92	8.77	4.40

Corporate bond yield is the domestic corporate bond yield. Policy rate is the domestic policy rate. Fed funds rate is the federal funds rate. ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. Gov bond yield is the 10- year generic government bond yield. VIX is the implied volatility for S&P 500 stock options.

percentile, with a mean of 7.03% and a median of 6.08%. In contrast to the corporate bond yield and the policy rate, the federal funds rate is a global variable that does not vary across countries but only across time periods. The average Fed funds rate is smaller than the average policy rate in emerging market economies. During my sample period the Fed funds rate averages at 2.2%. The VIX, which is also a global variable, has an average of 21.9 with a standard deviation of 8.74. On average, the peg variable is 0.14. Most countries in the sample do not have a peg. In more than 75% of the observation the value is zero. The capital openness measure takes on average the value 0.39 with a standard deviation of 1.32. The average quarterly real GDP growth is 1.06% with quarterly inflation at 1.42%. Government bond yields are on average 3.1 percentage points lower than corporate bond yields, ranging from only 3.92% at the 25th percentile of the distribution to 8.77% at the 75th percentile.

Debt issuance by the non-financial corporate sector in emerging markets has been relatively subdued in the pre-crisis period, but has seen strong growth since then (Shin, 2013). According to the BIS statistics, international debt issued was almost $375 in 2009–2012, which is more than twice as much compared to 2005–2008 (Chui et al., 2014). Tendulkar (2015) provides a more detail overview of the corporate bond market in emerging market economies. In terms of regional heterogeneity, emerging market countries in Asia have generally the most developed corporate bond market, followed by Latin America, Europe, Middle East, and Africa. In my sample, China has largest corporate bond market with more than $2.5 trillion outstanding in 2014. The smallest corporate bond market is located in Croatia with $0.54 billion outstanding. In addition, non-investment grade corporate bond issuance has been modest since the crisis. Most of the corporate bonds have an investment grade rating (Tendulkar, 2015). More credit rating information can be found in Bhatia (2002).

3. Stylized facts

Fig. 1 shows the simple average of local-currency corporate bond yields and domestic policy rates in emerging market economies as well as the federal funds rate. Except for the US hiking cycle from 1994 onwards, the three series move together quite closely. Between 2002 and 2004, all three series decline substantially. While the Fed started a hiking cycle in 2004, policy rates in emerging market economies did not follow suit for a year and even cut rates further. In the last quarter of 2005, emerging market economies also started hiking their policy rates which was accompanied by a rise in their corporate bond yields. In the third quarter of 2007, the US cut its rate for the first time in response to the incipient global financial crisis. Emerging market policymakers did not react to the global turmoil until end-2008 when the crisis started to spill over to the real economy and the Fed started its first asset purchase program. During this time, corporate bond yields also climbed higher. Once domestic policymakers started cutting rates, corporate bond yields also started to decline. When the crisis started to recede, some emerging market economies started hiking its rates as early as 2010. This hiking cycle, however, did not last long. In 2011, they revised their decision and cut rates again.

The figure indicates that the corporate bond yield is driven by the policy rate more than by the federal funds rate. However, perhaps the domestic central bank has followed the Fed's lead in order to prevent sudden exchange rate movements. If this is the case, the federal funds rate has indirectly affected the corporate bond yield through the dependency of monetary policy in emerging markets. Usually a larger policy rate spread between the domestic economy and the US leads to an appreciation of the domestic currency, as the demand for foreign currency increases because of the higher expected return (Gabaix and Maggiori, 2015). Therefore if the Fed hikes its policy rate and policymakers in emerging market economies do not want their exchange rate to depreciate they may have to follow suit and hike their rate as well. This further increases the corporate bond yield.

This argumentation raises the question as to whether corporate bond yields in emerging market economies would also rise if the emerging market economies do not follow the Fed in its interest rate policy. However, even if this is not the case, the policy differential may lead to a depreciation of the domestic currency.

4. Methodology

In this section, we aim to shed more light on the question of whether the local-currency corporate bond yields of emerging markets are affected by monetary policy in the US even if the domestic policy rate stays unchanged. I run the following regressions
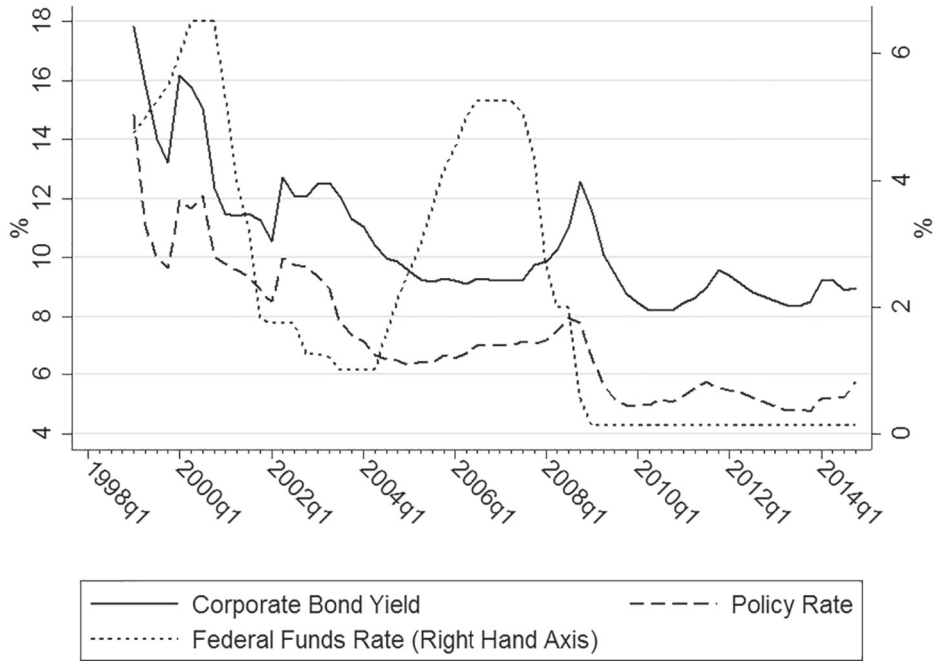
Fig. 1. Emerging market interest rates and the federal funds rate.
Source: Author's calculations; data: International Monetary Fund, Datastream.[2]

with quarterly data from 1999 until 2014:

$$CorpBondYield_{i,t} = \alpha + \beta FederalFundsRate_{t-1} + \epsilon_{i,t} \qquad (1)$$

$$CorpBondYield_{i,t} = \alpha + \gamma PolicyRate_{i,t-1} + \epsilon_{i,t} \qquad (2)$$

$$CorpBondYield_{i,t} = \alpha + \beta FederalFundsRate_{t-1} + \gamma PolicyRate_{i,t-1} + \epsilon_{i,t} \qquad (3)$$

By leaving the domestic policy rate out of the regression, I allow the domestic policy rate to move independently, and I can observe the effect of the federal funds rate on domestic funding conditions unconditional on the domestic policy rate. A positive sign indicates that a hike in the federal funds rate is associated with tighter funding conditions in emerging market economies un-conditional on the domestic policy rate. However, excluding the domestic policy rate in the equation, a positive association between the federal funds rate and corporate bond yields can transmit through the domestic policy rate. If the federal funds rate is positively correlated with the domestic policy rate, it may be the domestic policy rate affecting bond yields. The correlation can have different reasons. For instance, a high correlation of the business cycles calls for similar policy rate movements. Alternatively, the domestic central bank may mimic the Fed in an attempt to maintain a specific policy rate differential to the Fed to prevent international investors rebalancing their portfolios away from emerging market bonds.

Specification (2) emphasizes the effect of the policy rate for domestic funding conditions, leaving the federal funds rate un-changed. It shows how closely the corporate bond yield follows the domestic policy rate. We expect a positive sign because the domestic policy rate is a benchmark for all domestic bonds. The closer the coefficient is to 1, the closer the two series move together. If the coefficient is smaller than 1, the corporate bond yield is less sensitive to changes in the domestic policy rate. If the coefficient is larger than 1, the corporate bond yield is highly sensitive to changes in the domestic policy rate and even small changes in the domestic policy rate can lead to large movements in the corporate bond yield.

Finally, specification (3) highlights the importance of the federal funds rate for domestic funding conditions when the domestic policy rate stays unchanged. A positive sign in front of the federal funds rate in specification (3) can be interpreted as a spill-over effect from monetary policy in the US to domestic financing conditions. Here, the effect of US monetary policy cannot be transmitted through the domestic policy rate. It indicates that the corporates in emerging markets are exposed to changes in the stance of US monetary policy if the domestic policy rate is tailored towards domestic conditions. For instance, if the Fed hikes the target federal funds rate because of favorable economic conditions in the US but emerging market economies are not ready for the hike, they will leave their rate constant. If the coefficient on the federal funds rate is positive and significant, this means that the funding conditions for corporates in emerging markets will tighten even if the domestic policy rate stays unchanged.

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[2] The corporate bond yield and the policy rate are simple averages of a set of emerging market countries.

Table 2
Baseline without controls.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.400[*, **, ***] (0.09)		−0.152[***] (0.06)	0.470[***] (0.05)		−0.042 (0.03)
Policy rate		0.938[***] (0.02)	0.952[***] (0.02)		0.810[***] (0.02)	0.818[***] (0.02)
R^2	0.018	0.632	0.635	0.074	0.725	0.725
N	1116	1116	1116	1116	1116	1116
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects.

  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

5. Results

5.1. Main results

Table 2 shows the regressions described above without and with country fixed effects. Corporate bond yields are highly associated with the federal funds rate. The 10 bp hike in the federal funds rate in the previous quarter is associated with a 4 bp increase in the corporate bond yield. This indicates that corporate funding conditions in emerging market economies are transmitted from US monetary policy.

Column (2) shows that the corporate bond yield and the domestic policy rate move closely together. This indicates that the domestic policy rate follows the federal funds rate. Column (3) shows that the effect of the policy rate is almost unchanged compared to Column (2) but the sign of the federal funds rate changes. Regardless of the federal funds rate, the transmission of the domestic policy rate on corporate funding conditions remains almost 1:1. A higher federal funds rate is associated with a lower corporate bond yield if the policy rate stays unchanged.

While this result should be interpreted with caution, this effect may come from the confidence channel (Fratzscher et al., 2013). For instance, a relatively higher federal funds rate is often associated with optimism on the global financial markets and may lead to lower yields for risky assets such as emerging market corporate bonds.

The result shows that the Fed can have an impact on the corporate bond yield indirectly, but it does not seem to affect the power of the domestic policy rate to determine domestic funding conditions for corporates. That is a reassuring result both for emerging market policymakers but also for corporates in emerging markets. While it confirms the results by Rey (2013) that the global financial cycle affects conditions globally, my results also indicate that emerging market policymakers can shield corporates from higher bond yields by not following a Fed hike. However, empirically the domestic policy rate in emerging markets tends to follow the federal funds rate (Han and Wei, 2014).

There are different reasons for emerging market policymakers to follow the Fed. Usually, if the Fed hikes and domestic policy rates stay unchanged, the policy rate differential closes. This policy rate differential is, however, important for emerging market borrowers to attract funds. If interest rates in the US rise, investors may rebalance their portfolios towards US assets unless they are sufficiently compensated for the additional risk of emerging market assets. This is true for emerging market assets that are denominated in domestic currency because US investors face a currency risk investing in emerging market bonds, but not in US assets. However, it is also true if the emerging market economies are issuing the bonds in US dollars. Although a US investor would not face any direct currency risk, an appreciating US dollar weakens the balance sheet of the issuer of US dollar debt if the assets are mainly denominated in domestic currency. This increases the likelihood of default on these bonds as the debt burden in US dollar rises once the US dollar appreciates. Hence, when interest rates in the US rise but emerging market interest rates do not, this may lead to a depreciation of emerging market currencies.

The pooled regressions in Table 2 explain not only the time series variation of the corporate bond yield but also the cross-sectional variation. The results can also indicate that countries with higher domestic policy rates have higher corporate bond yields. I want to find out more about how corporate bond yields change over time when monetary policy changes. In order to exploit the time series variation of the corporate bond yield, I include country fixed effects in my regressions.

The results are qualitatively similar. Both the federal funds rate and the domestic policy rate are positively associated with corporate bond yields in separate regressions. In a joint regression that includes both the domestic policy rate and the federal funds rate, only the policy rate has a positive effect on corporate bond yields. The effect of the federal funds rate is still negative, but not significant anymore.

The results suggest that monetary dependence can be the reason why the federal funds rate is positively associated with corporate bond yields in emerging markets. While this greater monetary dependence can lead to less control over corporate bond yields, it is also associated with higher output volatility (Aizenman et al., 2010). However, a positive correlation between the domestic policy

Table 3
Baseline.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield
Fed funds rate	0.075[*], [**]		−0.020
	(0.03)		(0.03)
Policy rate		0.560[***]	0.565[***]
		(0.03)	(0.03)
Peg	−0.243	0.122	0.128
	(0.35)	(0.30)	(0.30)
Kaopen	−0.336[***]	0.083	0.084
	(0.11)	(0.10)	(0.10)
ΔGDP	−0.128	−0.648	0.188
	(6.06)	(5.04)	(5.16)
π	0.264[***]	0.136[***]	0.133[***]
	(0.06)	(0.05)	(0.05)
VIX	0.028[***]	0.024[***]	0.023[***]
	(0.01)	(0.01)	(0.01)
Gov bond yield	0.725[***]	0.196[***]	0.196[***]
	(0.03)	(0.04)	(0.04)
R^2	0.601	0.711	0.711
N	854	854	854
Country FE	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Peg is a dummy that equals 1 if the country is pegged and zero otherwise (Shambaugh, 2004). Kaopen is a measure of capital openness (Chinn and Ito, 2006). ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Gov bond yield is the 10- year generic government bond yield. Standard errors are in parentheses.

  [*] $p < 0.1$.
  [**] $p < 0.05$.
  [***] $p < 0.01$.

rate and the federal funds rate may be misleadingly interpreted as monetary dependence as it could be explained by a co-movement of the business cycles of the US economy and the emerging market economy. It is therefore important to obtain the orthogonal component of the interest rate that is not associated with economic conditions of the emerging market economy by including several control variables in the regression

$$CorpBondYield_{i,t} = \alpha + X + \phi' Z_{i,t-1} + \epsilon_{i,t} \qquad (4)$$

$$X = \begin{cases} \beta FedFundsRate_{t-1} \\ \gamma PolicyRate_{i,t-1} \\ \beta FedFundsRate_{t-1} + \gamma PolicyRate_{i,t-1} \end{cases}$$

The vector Z includes the variables Peg, Kaopen, ΔGDP, π, VIX, *GovBondYield*. Peg is a dummy that equals 1 if the country has an exchange rate peg, Kaopen is the capital account openness index of Chinn and Ito; ΔGDP is the GDP growth rate; π is the inflation rate; VIX is the option implied volatility of the S&P 500; and *GovBondYield* is the generic 10- year country-specific government bond yield.

Table 3 shows the results of Eq. (4). I can confirm the results of Table 2, namely that a higher federal funds rate and policy rate are both separately associated with a higher corporate bond yield. If they are nested into one regression, the federal funds rate becomes negative and insignificant. In terms of the other explanatory variables, a higher inflation rate is associated with a higher corporate bond yield. This is consistent with the logic that inflation distorts the real return of a bond, and investors target a real and not a nominal interest rate.

The VIX is another variable that captures the global financial cycle well and has received much attention recently in terms of how it determines the effects of global conditions (Bruno and Shin, 2015a; Forbes and Warnock, 2012; Rey, 2013). Option traders require a higher premium for holding put and call options on the S&P 500, when they expect the volatility of the S&P 500 to rise, as the probability of the option exceeding the strike price rises. These situations often occur during times of high uncertainty and in times of illiquid markets. Under these circumstances, investors require a premium on risky bonds such as those of emerging market corporates, and this may trigger a flight to safety. Hence, the positive and significant effect of the VIX is expected.

The 10- year generic government bond yield is also positively associated with the corporate bond yield. Corporate bonds and government bonds can be partly seen as substitutes. Although corporate bond yields are usually higher than government bond yields, investors will to shift to corporate bonds if their risk-adjusted return exceeds the return of government bonds. Government bond yields also proxy a country risk factor. If the default probability of a government is high, the government bond yield is high. Since a government default may spill over to the corporate sector, corporate bond yields are expected to rise as well.

The capital openness measure of Chinn and Ito (2006) measures how open the country is to cross-border capital transactions with respect to the presence of multiple exchange rate, current account, and capital account transactions as well as requirements in terms of surrendering export proceeds.

The peg dummy is taken from an updated version of Shambaugh (2004) and equals 1 if a country's exchange rate stays either within 2% bands against the base currency or there is zero volatility against the base currency in all months of a given year except for the month when the reference value changes.

I expect both measures to be negative. Greater capital openness allows foreigners to invest in corporate bonds of emerging market pushing their prices up and yields down. A credible peg reduces the exchange rate risk of investors both if the bond is denominated in US dollar and if it is denominated in domestic currency. When the bond is denominated in US dollar, the borrower might suffer if the US dollar appreciates, and the return on the domestic currency denominated bond varies 1:1 with the exchange rate. While this can be confirmed in a (not reported) pooled regression, both the capital openness measure and the peg dummy are not significant in the regression with country fixed effects. This may be explained by their relatively high persistence which means that a lot of the variation is already included in the country fixed effect.

To shed more light on heterogeneity between more and less capital open countries, I split the sample by the average emerging market capital openness. Table 4 delivers evidence that countries that are more open are unconditionally more exposed to the Fed than pegged countries. The intuition is simple. In countries where the capital account is open, foreign capital flows are not restricted, and a lower federal funds rate makes corporate bonds in emerging markets more attractive, capital will flow into these countries, driving prices up and yields down. Once the Fed starts to hike, more open countries are exposed to investors who withdraw their money and rebalance towards advanced economies and safer assets in general. Corporate bond yields are also more sensitive to the domestic policy rate in countries with greater capital openness than in countries that are less capital open. After controlling for the domestic policy rate, corporate bond yields are also more negatively affected by the federal funds rate. This is consistent with my confidence channel explanation. When the Fed hikes, this indicates that the global economy is doing well and more capital open countries are benefitting more from this confidence boost than corporates in less open countries.

Table 5 shows that non-pegged countries are more exposed to the federal funds rate than pegged countries. The latter may defend their fixed exchange rate with currency reserve when the Fed hikes the federal funds rate. Emerging market countries that are not officially pegged to the US dollar but would like to prevent a depreciation when the Fed hikes its policy rate so that they may follow suit and increase the domestic policy rate as well. That raises the domestic corporate bond yield but prevents the country from a depreciation of its currency and protects the corporates with non-hedged net liabilities in US dollar. In addition, pegged countries are more sensitive to the domestic policy rate than non-pegged countries.

In addition to the corporate bond yield per se, I am also interested in the premium corporates have to pay compared to the government. I construct the corporate bond yield spread by subtracting the 10- year government bond yield from the corporate bond yield. The yield spread is an indicator of the risk premium and reflects the risk of corporates as compared to governments. Theoretically, a lower policy rate should boost the earnings of corporates at longer horizons meaning that the yield spread is an increasing function of the domestic policy rate if corporate bond yields react to policy rate changes more strongly than government bond yields. The spillover of the interest rate policy in the US on the yield spread does seem to have a significant impact even if I

Table 4
Breakdown by capital openness.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. Yield
Fed funds rate	0.131***	0.001			−0.109***	−0.032
	(0.04)	(0.04)			(0.03)	(0.04)
Policy rate			0.742***	0.446***	0.791***	0.452***
			(0.03)	(0.05)	(0.03)	(0.05)
ΔGDP	−23.780***	16.333*,***	−21.835***	13.033	−16.603***	13.588*
	(7.43)	(8.88)	(4.73)	(8.05)	(4.84)	(8.13)
π	0.417***	0.131	0.197***	0.053	0.181***	0.044
	(0.07)	(0.09)	(0.05)	(0.08)	(0.05)	(0.08)
VIX	0.025***	0.033***	0.027***	0.028***	0.024***	0.026***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gov bond yield	0.661***	0.783***	0.035	0.310***	0.019	0.309***
	(0.05)	(0.03)	(0.04)	(0.05)	(0.04)	(0.06)
R^2	0.487	0.6421	0.776	0.7035	0.784	0.704
N	408	491	408	491	408	491
Sample	High Kaopen	Low Kaopen	High Kaopen	Low Kaopen	High Kaopen	Low Kaopen
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Gov bond yield is the 10- year generic government bond yield. Standard errors are in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 5
Breakdown by peg.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.051	0.090[*, **, ***]			−0.004	−0.012
	(0.03)	(0.03)			(0.02)	(0.03)
Policy rate			0.750[***]	0.558[***]	0.755[***]	0.560[***]
			(0.08)	(0.03)	(0.08)	(0.03)
ΔGDP	−20.076[***]	0.532	−1.803	−0.362	−1.181	0.159
	(7.07)	(6.19)	(3.46)	(5.09)	(4.72)	(5.24)
π	−0.036	0.287[***]	0	0.143[***]	−0.002	0.141[***]
	(0.05)	(0.06)	(0.03)	(0.05)	(0.03)	(0.05)
VIX	−0.024[***]	0.033[***]	−0.007	0.027[***]	−0.007	0.027[***]
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Gov bond yield	−0.060	0.740[***]	−0.135[***]	0.194[***]	−0.135[***]	0.195[***]
	(0.06)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)
R^2	0.363	0.605	0.775	0.717	0.775	0.717
N	58	841	58	841	58	841
Sample	Peg	Non-peg	Peg	Non-peg	Peg	Non-peg
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Peg is a dummy that equals 1 if the country is pegged and zero otherwise (Shambaugh, 2004). ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Gov bond yield is the 10- year generic government bond yield. Standard errors are in parentheses.

  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

allow the policy rate to adjust (Table 6). Perhaps both government bond yields and corporate bond yields in emerging market economies react insignificantly differently to monetary policy changes in the US. my hypothesis that a lower policy rate should depress the spread between the corporate bond yield and the government bond yield is confirmed in column (2). If the domestic policy rate stays unchanged, the federal funds rate has a negative impact on the corporate bond yield. This can again be explained by the confidence channel. A cut in the federal funds rate indicates that economic conditions are worse than expected, so that investors shift disproportionately away from corporates, which results in their yields rising. This confidence channel does not seem to be at work for the domestic policy rate. If the domestic policy rate is cut this lowers the corporate bond yield spread. This indicates that confidence in the global economy is highly dependent on the US monetary policy stance.

Unconventional monetary policy has become more important in recent years. The Fed's large-scale asset purchase program and its spillover to emerging market economies has received much attention recently (Burger et al., 2015). To corroborate whether my findings also hold for unconventional monetary policy, I proxy unconventional monetary policy in the US with the Fed's balance sheet size.

The Fed's large-scale asset purchase program led to a ballooning balance sheet and an increase in the monetary base (Fawley and Neely, 2013; Krishnamurthy and Vissing-Jorgensen, 2013). I expect the size of the Fed's balance sheet to have a negative impact on corporate bond yields in emerging market economies. The asset purchase program pushes down the yields of treasury securities because of their imperfect substitutability (Bernanke, 2012). When the prices of treasury securities fall, yield-hungry investors shift to other bonds that yield higher returns, e.g. emerging market corporate bonds. The increased demand may push up prices and lower yields.

Table 7 confirms my hypothesis that a larger Fed's balance sheet is associated with a lower corporate bond yield in emerging market economies unconditional on the domestic policy rate. Once the Fed starts buying assets, emerging markets may cut their rates as the purchase program puts downward pressure on the US dollar. This can be seen in Fig. 1, when emerging markets started cutting rates when the Fed announced its first large-scale asset purchase program in the last quarter of 2008.

However, if the domestic central bank leaves the policy rate unchanged and does not follow the Fed in the monetary policy stance, the larger balance sheet of the Fed even raises corporate bond yields in emerging market economies.

5.2. Robustness tests

The results are also very robust to the inclusion of other factors such as the percentage change in the domestic stock market index or the inclusion of the yield of the German 10- year government bond, the Bund. The results also hold when I drop variables from my specification successively (Table A1).

Tables A2–A5 split the regressions into various sub-regions. Table A2 shows that the results hold for Asian emerging market economies. This is also true for Africa (Table A4). In South American emerging market economies the Fed funds rate does not even unconditionally have a statistical significant impact on corporate bond yields (Table A3). Table A5 shows the results for Emerging Europe. While the regressions without country fixed effect deliver similar results to the baseline specification, the regression with

Table 6
Corporate bond yield spread.

	(1) Corp. yield spread	(2) Corp. yield spread	(3) Corp. yield spread
Fed funds rate	−0.014		−0.099***
	(0.03)		(0.03)
Policy rate		0.141***	0.166***
		(0.02)	(0.02)
Peg	−0.184	−0.166	−0.133
	(0.39)	(0.38)	(0.38)
Kaopen	−0.233*,**	0.035	0.039
	(0.12)	(0.12)	(0.12)
ΔGDP	−0.547	−7.050	−2.927
	(6.69)	(6.40)	(6.51)
π	0.116*	0.045	0.033
	(0.06)	(0.06)	(0.06)
VIX	0.014*	0.008	0.003
	(0.01)	(0.01)	(0.01)
R^2	0.015	0.061	0.071
N	858	858	858
Country FE	Yes	Yes	Yes

The dependent variable is the spread between the corporate bond yield and the 10- year generic government bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Standard errors are in parentheses.

   * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

Table 7
The Fed's unconventional monetary policy.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield
Fed balance sheet	−0.178***		0.059
	(0.05)		(0.04)
Policy rate		0.679***	0.695***
		(0.03)	(0.03)
Peg	−0.062	0.378	0.417
	(0.38)	(0.30)	(0.30)
Kaopen	−0.837***	−0.268**	−0.231**
	(0.15)	(0.11)	(0.12)
ΔGDP	−13.202**	−3.122	0.207
	(6.64)	(4.78)	(5.23)
π	0.252***	0.145***	0.140***
	(0.06)	(0.05)	(0.05)
VIX	0.026***	0.027***	0.026***
	(0.01)	(0.01)	(0.01)
Gov bond yield	0.758***	0.079**	0.075*
	(0.03)	(0.04)	(0.04)
R^2	0.600	0.755	0.756
N	719	719	719
Country FE	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed balance sheet is the size of the Fed's balance sheet divided by GDP. Policy rate is the domestic policy rate. Peg is a dummy that equals 1 if the country is pegged and zero otherwise (Shambaugh, 2004). Kaopen is a measure of capital openness (Chinn and Ito, 2006). ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Gov bond yield is the 10- year generic government bond yield. Standard errors are in parentheses.

   * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

fixed effects indicate that in emerging Europe a tightening of the Fed is associated with higher corporate bond yields.

Tables A6 and A7 show the results only for the pre-crisis period and post-crisis period, separately. The results are qualitatively the same before and after the financial crisis.

6. Conclusion

In this paper I have examined the determinants of corporate bond yields with a focus on the spillover effects of US monetary policy. My results can be summarized as follows: the domestic policy rate is the main determinant of corporate bond yields in emerging market economies. In addition, the corporate bond yield can be determined indirectly by US monetary policy. When the Fed hikes its policy target rate and the domestic policy rate follows suit, the corporate bond yields of emerging market economies increase. If the domestic policy rate is held constant, however, the effect of the federal funds rate diminishes. The results are qualitatively the same for unconventional monetary policy. An increase in the Fed's balance sheet does not lower corporate bond yields if the domestic policy rate stays constant and may even lead to a higher corporate bond yield through a confidence channel. If the Fed expands its balance sheet, this indicates worse conditions than expected, leading investors to move into safe assets with a negative impact on the risky assets such as emerging market corporate bonds.

My results suggest a tradeoff for policymakers in emerging market economies. If the Fed raises rates and policymakers in emerging markets leave their policy rate unchanged, the decreasing policy rate gap between emerging markets and the US may lead to a depreciation pressure of the emerging market currencies against the US dollar. If policymakers allow emerging market currencies to depreciate, US dollar debtors in emerging markets suffer severely from an appreciating US dollar if their US dollar debt is not sufficiently hedged. Alternatively, the domestic central bank can follow the Fed in its hiking decision and may prevent a depreciation of the exchange rate. This, however, tightens funding conditions for corporates and can induce rollover risk that can spill over to both the domestic economy and the global financial system.

Defending the exchange rate with accumulated exchange rate reserve when the Fed starts to hike rates seems to be an alternative that protects emerging markets corporates. However, if emerging market's are pegged to the US dollar and the US dollar appreciates against a basket of currencies, emerging market currencies will also appreciate in effective terms. The effective appreciation results in a less competitive environment for their products with negative consequences for exporters.

Appendix A

Table A1
Robustness.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.017	−0.004	−0.005	−0.010	−0.010	−0.015
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Policy rate	0.678[*,***]	0.699[***]	0.699[***]	0.702[***]	0.725[***]	0.725[***]
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
π	0.053	0.035	0.045	0.042	−0.029	−0.037
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
ΔGDP	0.049	−7.155	−8.623	−7.693	−3.664	
	(5.53)	(5.29)	(5.29)	(5.25)	(5.23)	
Kaopen	−0.219[**]	−0.253[***]	−0.242[**]	−0.251[***]		
	(0.09)	(0.09)	(0.09)	(0.09)		
Peg	−0.282	−0.369	−0.392			
	(0.26)	(0.26)	(0.26)			
Δ Stock market	−0.532	−1.122[***]				
	(0.42)	(0.40)				
VIX	0.029[***]					
	(0.01)					
R^2	0.652	0.646	0.643	0.642	0.638	0.637
N	1056	1056	1056	1056	1109	1109
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Peg is a dummy that equals 1 if the country is pegged and zero otherwise (Shambaugh, 2004). Kaopen is a measure of capital openness (Chinn and Ito, 2006). ΔGDP is the quarterly GDP growth. π is the quarterly inflation rate. VIX is the implied volatility for S&P 500 stock options. Gov bond yield is the 10- year generic government bond yield. Standard errors are in parentheses.

  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

Table A2
Sample: emerging Asia.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.450*,**,***		−0.073	0.546***		−0.006
	(0.13)		(0.06)	(0.09)		(0.04)
Corporate bond yield		0.952***	0.956***		0.858***	0.859***
		(0.02)	(0.02)		(0.02)	(0.02)
R^2	0.022	0.822	0.823	0.074	0.821	0.821
N	524	524	524	524	524	524
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans the subsample of Asian emerging market economies..

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A3
Sample: emerging South America.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.277		−0.189	0.154		−0.191*,**
	(0.19)		(0.11)	(0.13)		(0.10)
Corporate bond yield		0.847***	0.861***		0.737***	0.767***
		(0.04)	(0.04)		(0.06)	(0.06)
R^2	0.010	0.669	0.673	0.007	0.466	0.476
N	203	203	203	203	203	203
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans the subsample of South American emerging market economies..

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A4
Sample: emerging Africa.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.995*, ***		−0.111**	0.995***		−0.111**
	(0.20)		(0.05)	(0.20)		(0.05)
Corporate bond yield		1.357***	1.405***		1.357***	1.405***
		(0.03)	(0.04)		(0.03)	(0.04)
R^2	0.281	0.965	0.968	0.281	0.965	0.968
N	63	63	63	63	63	63
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans the subsample of African emerging market economies.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A5
Sample: emerging Europe.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.294*, ***		−0.085	0.435***		0.069**
	(0.08)		(0.07)	(0.04)		(0.03)
Corporate bond yield		0.568***	0.587***		0.568***	0.543***
		(0.04)	(0.04)		(0.02)	(0.02)
R^2	0.040	0.429	0.432	0.228	0.704	0.708
N	326	326	326	326	326	326
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans the subsample of European emerging market economies.
  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

Table A6
Pre-crisis.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	0.138		−0.001	0.201		0.019
	(0.18)		(0.10)	(0.12)		(0.10)
Corporate bond yield		0.918*, **, ***	0.918***		0.811***	0.810***
		(0.04)	(0.04)		(0.11)	(0.11)
R^2	0.001	0.685	0.685	0.011	0.693	0.693
N	585	585	585	585	585	585
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans from 1999Q1 until 2007Q4.
  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

Table A7
Post-crisis.

	(1) Corp. yield	(2) Corp. yield	(3) Corp. yield	(4) Corp. yield	(5) Corp. yield	(6) Corp. yield
Fed funds rate	1.098*, **, ***		−0.203	1.208***		0.268
	(0.38)		(0.24)	(0.27)		(0.22)
Corporate bond yield		1.173***	1.184***		0.853***	0.800***
		(0.05)	(0.05)		(0.12)	(0.13)
R^2	0.023	0.516	0.517	0.152	0.454	0.460
N	511	511	511	511	511	511
Country FE	No	No	No	Yes	Yes	Yes

The dependent variable is the corporate bond yield. All independent variables are lagged by one quarter. Fed funds rate is the federal funds rate. Policy rate is the domestic policy rate. Standard errors are in parentheses. Specifications (4)–(6) are estimated with country fixed effects. The sample spans from 2008Q1 until 2014Q3.
  * $p < 0.1$.
  ** $p < 0.05$.
  *** $p < 0.01$.

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