U.S. Monetary Policy Surprises and Emerging Markets Sovereign Spreads

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Abstract

The importance of U.S. monetary policy surprises in explaining movements in emerging markets' sovereign spreads is explored using a monthly unbalanced panel data for 17 countries for 1998-2006. The unanticipated component of the U.S. monetary policy is extracted by using changes in the Federal funds futures rates for various maturities immediately before and after the FOMC meetings. Credit ratings data of each of the 17 countries are used to control for country specific fundamentals in estimations. The time series properties of the data receive special emphasis and panel unit root tests are used for checking order of integration of variables. Since the unanticipated component of the U.S. monetary policy is stationary by construction, the nonstationary series are differenced and rendered stationary prior to fixed effects panel estimations. The findings indicate that it is the *unanticipated* component and not the *anticipated* component of the U.S. monetary policy that is significant in explaining the movements in the emerging markets' sovereign bond spreads.

JEL classification: E43, F36, G15.
Keywords: Eurobonds; Federal Funds Futures contracts; News Effects; Sovereign Credit ratings; panel unit root tests.

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1 Introduction

Following the financial account liberalizations at the end of the 1980s, the quantity and value of external debt raised by emerging market economies in the form of Eurobond issues increased significantly, albeit non-monotonically. The cost of raising capital by issuing Eurobonds depends on country risk and varies among countries since other than global liquidity, idiosyncratic factors referred to as "country-specific fundamentals"also matter. The spread on each emerging market country's sovereign bond -the premium that is offered to investors above the yield paid on the U.S. government bonds with the same maturity- is a proxy for that country's sovereign risk.

During the 1998-2006 period, the annual average spreads on emerging market bonds tightened, again non-monotonically, approximately by 610 basis points, from 810 basis points to close to 200 basis points. The improving country-specific fundamentals clearly played an important role in reducing the spreads. However, the abundance of global liquidity and increased risk appetite of investors stemming from the looseness of monetary policy in the financial centers and the recent inflow of institutional investors such as the pension funds were also influential. Whether the significant decline in interest rate spreads since the beginning of 2001 is sustainable or not is a nontrivial issue. To put it differently, whether worsening fundamentals and/or worsening market sentiment would trigger a sudden reversal in capital flows from emerging market economies and the timing of such a reversal is very critical both to lenders and the policymakers of the borrowers.

Previous empirical literature used various proxies for global liquidity conditions and the risk appetite of the investors, also referred to as the "push"factors. Eichengreen and Mody (1998) used 10-year U.S. Treasury bond yield as a proxy for global liquidity conditions. However since the U.S. Treasury bonds are taken

as the risk-free assets in calculating the sovereign spreads, using 10-year U.S. treasury bond as a proxy may be subject to endogeneity criticism. Arora and Cerisola (2001) use the target Federal funds rate to control for the global liquidity conditions and the ARCH based volatility of the difference between the yield on three-month U.S. treasury bills and the U.S. Federal funds target rate to control for market turbulence. Alternatively, the three-month dollar LIBOR rate and and the VIX, which is an index that measures the volatility implied by options contracts on the S&P 500 index, was used in the *2004 Global Financial Stability Report* of the IMF as a proxy. However, it may be argued that the current Federal funds target rate or the current dollar LIBOR rate may be regarded as poor proxies for global liquidity conditions since expectations of future Federal funds rate changes are not taken into account and hence they are not inherently forward looking. This possible criticism is remedied in *2006 Global Financial Stability Report* and the three-month ahead Federal funds futures rates is used as a proxy.

As proxies for country specific fundamentals, so called the "pull" factors, Arora and Cerisola (2001) choose a set of macroeconomic variables that proxy the fiscal position, monetary position, foreign exchange reserves of the central bank and the balance of payments dynamics. To proxy country specific fundamentals, *2004 Global Financial Stability Report* of the IMF used an average of credit ratings assigned by S&P, Moody's, and Fitch. Finally *2006 Global Financial Stability Report* used the economic, financial and political risk indices of the *International Country Risk Guide* published by the PRS group.

This paper adds to the existing empirical literature on main drivers of emerging market bond spreads in two dimensions. First, instead using the level of the U.S. Federal funds target rate or the Federal funds futures rate, we decom-

pose U.S. monetary policy changes into anticipated and unanticipated components and then analyze the impact of the U.S. monetary policy on sovereign spreads through its effect on global liquidity conditions. Note that this approach is consistent with efficient markets hypothesis which implies that asset prices are expected to respond to unanticipated instead components of monetary policy actions.[1] Specifically, we follow the methodology of Kuttner (2001) and utilize the change in the Federal funds futures rates of different horizons within the neighborhood of FOMC meetings. Second, we pay special attention to the time series properties of sovereign spreads, the Federal funds futures rates at different maturities and the credit ratings variables. Specifically using panel unit root tests, we uncover that the emerging market sovereign spreads, the Federal funds futures rates and the sovereign credit rating series are all integrated of order one and by construction the unanticipated surprise component of the U.S. monetary policy is stationary. We first difference the series that are integrated of order one, rendering them stationary and then analyze the determinants of sovereign spreads so that the estimation results are not adversely effected by spurious regression and inconsistent regression problems.

Based on unbalanced panel feasible GLS estimation results for 17 emerging market economies, the findings indicate that other than country specific fundamentals and the implied volatility measure, the *unanticipated* component and not the *anticipated* component of the U.S. monetary policy is significant in explaining the spread movements. This result is robust to the choice of Federal funds futures contract maturity.

[1]Within the last decade, a burgeoning empirical literature has studied the impact of monetary policy surprises on the U.S. yield curve. Rudebusch (1998) used VAR-based measures of monetary policy shocks, Kuttner (2001) was the first to employ Federal funds futures rates to isolate policy surprises and showed the relative importance of unanticipated policy surprises for daily and monthly frequencies and Gurkaynak et al. (2005) construct an intraday data set and verify the findings of Kuttner.

The paper is organized as follows. Section 2 describes the data and methodology used in estimations. Section 3 presents estimation results. Section 4 concludes.

2 Methodology and Data

This paper analyzes the determinants of emerging market sovereign spreads which is proxied by the natural logarithm of the monthly avrages of the daily J.P. Morgan Chase EMBI+ data.[2]

A number of relatively recent papers have addressed the issue of how movements in emerging market sovereign bond spreads can be accounted for.[3]These studies broadly categorize the factors that effect movements in spreads into two. The first category includes country specific fundamentals labeled as the "pull"factors. The pull factors include indicator variables for denoting the stance of fiscal, monetary, and external balance of a country. These country-specific fundamentals are referred to as the pull factors since borrowers compete and attract financial flows based on the soundness of these variables. Alternatively sovereign credit ratings announced by the rating agencies have been used as a proxy for these pull factors. The second category of factors that effect move-

[2]J.P. Morgan EMBI+ covers Brady and other restructured sovereign bonds and takes U.S. treasuries as the risk-free assets. Specifically, the EMBI+ Composite Index compromises mainly Eurobonds and Brady bonds with a minimum face value of U.S.$ 500 million and a maturity of at least 2.5 years and covers a cross-section of 18 countries. (their ratings must be lower than BBB+ according to S&P's), and 68 instruments, from 1998 onwards.

[3]Among others see Arora and Cerisola (2001), Eichengreen and Mody (1998), IMF Global Financial Stability Report (2004) and (2006), Sy (2001) and Uribe and Yue (2006).

ments in spreads includes international investor sentiment and global liquidity conditions labeled the "push"factors. Global liquidity conditions are referred to as the push factors since lower returns in financially mature countries push excess liquidity to emerging market economies. Push factors may be proxied by indicator variables for global liquidity availability such as the U.S. Federal funds target rate or the volatility of the difference between the U.S. Federal funds rate and U.S. treasury bill yields. We next examine the determinants of emerging market sovereign spreads according to the two criteria: pull factors and push factors.

2.1 Pull Factors

As proxies for country specific fundamentals, so called the pull factors, Arora and Cerisola (2001) choose a set of macroeconomic variables including the fiscal balance, the net foreign asset position of the banking system, central government debt and total external debt (all as a percentage of the GDP ratio), the debt-service ratio as well as the ratio of gross international reserves to imports. Cantor and Packer (1996) report that per capita income, GDP growth, inflation, fiscal balance, external debt, an indicator for economic development and an indicator for default history can explain the 90 % variability in sovereign credit ratings. Besides these, there is also evidence that the sovereign ratings are the key determinants of the pricing of sovereign bonds and that sovereign spreads incorporate market participants' views of expected rating agencies. (Sy, 2001) Accordingly,

in order to proxy country specific fundamentals, *2004 Global Financial Stability Report* of the IMF used an average of credit ratings assigned by Standard and Poor's, Moody's, and Fitch. Finally *2006 Global Financial Stability Report* used the economic, financial and political risk indices of the *International Country Risk Guide* published by the PRS group.

We use credit ratings of Standard and Poor's to capture to control for the country specific fundamentals in our estimations. Following Sy(2003), the rating scale is first translated into an index spanning from 1 to 58 by treating changes in outlook as intermediate steps between each rating. Next, this index is subjected to a logit-type transformation to account for possible nonlinearities in the rating scale as follows:

$$L_t = ln(\frac{I_t}{59 - I_t})$$

where I_t denotes the assigned index value of the rating scale by Standard and Poor's. Table 1 presents the Standard and Poor's ratings, associated assigned scores and the logit transformed index values.

Insert Table 1 here

2.2 Push Factors

Global liquidity conditions influence the sovereign spreads in an environment of increased globalization. From the beginning of the 1990s emerging markets

became more dependent to changes in the U.S. monetary policy, because of its weight in the mature financial markets, political and economic power in the world. In the previous empirical literature two factors have been found to be determining the push factors, namely the short-term interest rates and the observed volatility in the mature financial markets.

From a theoretical perspective, the yield on the interest rate spread can be defined as the return on risky asset minus the return on risk-free asset. Emerging market bonds can be thought as the risky asset since they have a higher probability of default than the yield on government bonds of countries with mature financial markets such as the U.S. One can easily demonstrate that the rate on risky asset has to rise more than any rise on risk-free asset in order to compensate investors for risk.[4]

Suppose that r and i denote interest rates on a risk-free asset and a risky asset, respectively, for some pre-specified time horizon. Let p denote the probability of repayment of the risky asset and $S = i$ - r, denote the interest rate spread.

Under the assumptions of perfect capital mobility with no transaction costs and risk-neutral investors, in equilibrium, return on the risk-free asset is equal to the expected return on risky asset: $(1+r)$=$p\times(1+i)+(1-p)\times 0$. The partial derivative of S, with respect to r is $(1-p)/p$, which is positive since $p < 1$. One may also consider a situation in which the probability of repayment of the

[4]The ensuing discussion borrows heavily from Arora and Cerisola (2001).

risky asset depends negatively on the risk-free rate, r. An increase in return on risk-free asset may cause investors to invest more on the risk-free asset, which in turn reduces the probability of repayment on the risky asset since emerging market countries cannot roll over their existing debts in the scarcity of foreign capital. In such a situation the derivative of S with respect to r is greater than $(1-p)/p$ and is equal to $\{(1-p)/p\} - \{(1+r) \times p'/p^2\}$. In sum, it can be shown that emerging markets' Eurobond prices fall faster as a result of a fall in the price of a U.S. treasury bond of comparable maturity leading to a rise in the interest rates.

Due to the endogeneity issue, emerging market sovereign spreads are generally modeled as a function of a short-term interest rates in mature markets (usually controlled by the monetary authority) since if the expectations hypothesis holds, price movements of notes and bonds -in the longer-maturities of the yield curve- are associated with corresponding price movements in the short-end. Arora and Cerisola (2001) use effective Federal funds rate and the IMF's *Global Financial Stability Report* (2004) use three-month dollar LIBOR rate.

However, the use of a short-term interest rate controlled by the monetary authority such as the Federal funds rate as a proxy for global liquidity conditions may not be appropriate for cases when future rate-change announcements take place. Consider the emerging market sell-off episode in 2004. On 4 May 2004,

Federal Reserve Open Market Committee (FOMC) held a regular meeting.[5] The Committee decided to keep the Federal funds target rate at 1% while in the released minutes of the meeting, signalled a future increase in target Federal funds rate.

Insert Figure 1 here

As can be seen from Figure 1, immediately before and especially after the release of the minutes, EMBI+ Composite Index increased sharply. This rise in the spreads cannot be captured by current effective Federal funds rate. One possibility to address this problem is the use of Federal funds futures rate that captures the forward looking behavior of the investors and this has been taken up in the IMF's *Global Financial Stability Report* (2006). However, even though the use of Federal funds futures rate incorporates the forward looking expectations, it fails in terms of incorporating the news literature which suggests that it is the unanticipated changes that affect the long-term interest rates rather than the anticipated ones.

The relatively recent news literature, including Rudebusch (1998), Kuttner (2001), Gurkaynak et. al. (2005) 2005b) and Gurkaynak (2005), decomposes the changes in the target Federal funds rate into anticipated and unanticipated

[5]The FOMC holds eight regularly scheduled meetings per year. At these meetings, the Committee reviews economic and financial conditions, and determines the appropriate stance of monetary policy.

components by making use of the Federal funds futures rates.[6] Kuttner (2001) estimates the impact of monetary policy actions on bill, note and bond yields, using data from the futures market in the 1989-2000 period and reports that the U.S. yield curve's response to anticipated target rate change is small, while their response to unanticipated change is positive and highly significant. We next introduce the methodology in Kuttner for disentangling the changes in the Federal funds rates to anticipated and unanticipated components and then present the results by extending the estimation period to 1989-2006.

It is important to start by noting that the Federal funds futures contracts' settlement price is determined by the monthly average effective Federal funds rate, rather than the rate on a certain day. Hence, the difference between the average effective Federal funds rate, $\tilde{r}$, in month s and the one-month futures rate, f^1, on the last day of month *s-1* can be treated as the "surprise."The monthly unanticipated change in the effective Federal funds rate may be defined as the average effective Federal funds rate in month s, minus the 1-month futures rate on the last day of previous month:

$$\bar{\Delta}\tilde{r}_s^u \equiv \frac{1}{m}\sum_{i\in s}\tilde{r}_i - f_{s-1,m}^1 \tag{1}$$

where m denotes the number of business days in month s. Hence the monthly

[6]Federal funds futures contracts have been traded on the Chicago Board of Trade since October 1988 and settle based on the average effective Federal funds rate that is realized for the calendar month specified in the contract. Thus, daily changes in the current-month futures rate largely reflect the revisions to the market's expectations for the Federal funds rate over the remainder of the contract.

anticipated changes in the funds rate can be defined as:

$$\bar{\Delta}\tilde{r}_s^a \equiv f_{s-1,m}^1 - \tilde{r}_{s-1,m} \tag{2}$$

In these two equations $\bar{\Delta}$ is used to refer to the change from the last day of month s-1 to the average of month s.

The sum of these two anticipated and unanticipated components is the average Federal funds rate in month s minus the Federal funds rate on the last day of month *s-1*.

After calculating the anticipated and the unanticipated components, Kuttner regresses the change in interest rates of various maturities on the two components of the Federal funds effective Federal funds rate changes.

$$\bar{\Delta}R_s^i = \alpha_i + \beta_1^i \bar{\Delta}\tilde{r}_s^a + \beta_2^i \bar{\Delta}\tilde{r}_s^u + \varepsilon_1^i \tag{3}$$

Table 2 extends Kuttner's results to the 1989-2006 period and confirms the assertion that it is the unanticipated and not the anticipated component of Federal funds target rate changes that effects changes in the long-term rates.

Insert Table 2 here

The yield on three-month treasury bills rises by 81 basis points in response to an unanticipated one percent increase in the target. The estimated responses of notes and bonds in the longer-end of the yield curve are smaller, and display a

"hump shape." The 10-year and the 30-year bond yields rise by 42 and 34 basis points, respectively, after a one percentage point surprise tightening. The findings in Table 2 are comparable to those reported by Kuttner, although the estimated responses of note and bond rates are somewhat larger. We may conclude that if longer-term U.S. assets indeed respond only to the unanticipated component of Federal funds target rate changes and since U.S. bonds are considered as the risk free assets, modeling emerging market sovereign spreads as a function of anticipated and unanticipated components separately will be an improvement of the current literature.

The unanticipated component as defined in equation 3 is "in a way" backward-looking since it is simply the difference of the past month's expectations of the Federal funds futures rate from the average of the current month's actual effective Federal funds rate. In order to capture the impact of, say, the May 4, 2004 FOMC minute release, we need a more forward-looking definition for the unanticipated component to be used in the estimations of emerging market sovereign spreads. We define the "forward looking" unanticipated change in Federal funds rate in month s as the change in the forward expectations following an FOMC meeting on day j. Specifically, the unanticipated change variable takes on the value zero when there is no FOMC meeting in a month, and for all other months, equals the value of the difference between the maximum of the Federal funds futures rate in the five business days following the FOMC meeting on day j and the Federal

funds futures on day $j-1$ for each maturity i. Hence, the modified unanticipated can be calculated as

$$\Delta r^{u}_{s,i} \equiv max(f^{i}_{s,j}, f^{i}_{s,j+1}, ..., f^{i}_{s,j+5}) - f^{i}_{s,j-1}, \quad i = 1, ..., 5. \tag{4}$$

Note that the unanticipated component is calculated for each FOMC meeting day rather than for only those meetings with target Federal funds rate changes. The Federal funds futures rate is used to proxy the anticipated component of the U.S. monetary policy.

Financial market volatility is another measure for capturing the investor sentiment and hence the global liquidity conditions. There are different methods in modeling the volatility in mature financial markets. Arora and Cerisola (2001) use the fitted values for the conditional standard error from an ARCH model of the spread between the yield on the three-month U.S. treasury bill and the U.S. Federal funds rate. IMF's *2004 and 2006 Global Financial Stability Reports*, use VIX which is the volatility implied by the options contracts on the S&P's 500 index, obtained from the Chicago Board of Exchange. We use the VIX as a proxy for mature financial market volatility in our study.

Figure 2 plots the EMBI+ total and the VIX both of which are used in our estimations.

Insert Figure 2 here

3 Time Series Properties and Estimation Results

We use monthly averages of the J. P. Morgan Chase's EMBI+ index spread for 17 emerging market countries for the period September 1997 to December 2005 as the dependent variable.[7]

Monthly credit ratings of long-term foreign currency debt for each of the 17 emerging market countries are obtained from the web-site of Standard and Poor's. The U.S. interest rate data are the monthly averages of the daily rates obtained from the data base FRED available in the web site of the Federal Reserve Bank of St. Louis. The one through five months ahead Federal Funds futures rate are obtained from Bloomberg which uses data of the Chicago Board of Trade. The VIX are obtained from the web site of the Chicago Board of Trade Exchange. Except for the U.S. interest rates, all variables are expressed in natural logarithms.

The rating scale is first translated into an index spanning from 1 to 58 by treating changes in outlook as intermediate steps between each rating. Next, as described in the previous section, this index, I_t, is subjected to a logit-type transformation to account for possible nonlinearities in the rating as follows: $L_t = ln(I_t/59 - I_t)$

Following the discussion in the previous section, we next calculate the "forward looking" unanticipated change in Federal funds rate as the change in the forward expectations following an FOMC meeting on day j as follows: we create

[7]The 17 emerging market countries are: (in alphabetical order) Argentina, Brazil, Bulgaria, Columbia, Ecuador, Egypt, Mexico, Morocco, Panama, Peru, Philippines, Poland, Russia, South Africa, Turkey, Ukraine and Venezuela. Since credit rating data on Nigeria was unavailable, Nigeria is excluded from the analysis.The daily EMBI+ index data is obtained from http://cbonds.info

an indicator variable takes on the value zero when there is no FOMC meeting in a month, and for all other months, equals the value of the difference between the maximum of the Federal funds futures rate in the five business days following the FOMC meeting on day j and the Federal funds futures on day $j-1$ for each maturity i. We proxy the anticipated changes in the monetary policy as the level of the Federal funds futures rates for various maturities.

Before estimating the model that explores the determinants of emerging market sovereign debt spreads, we first explore the time series properties of the data. We conduct two classes of unit root tests to determine the order of integration of each variable. For variables that do not vary across cross-sections, such as the U.S. interest rates, the VIX as well as the anticipated and the unanticipated components, we conduct standard univariate unit root tests. For variables that vary cross-sectionally, such as the sovereign spreads and the credit rating index, we employ panel-based unit root tests that have higher power than unit root tests based on individual time series.

Consistent with previous empirical work, based on standard univariate unit root tests such as the Augmented Dickey Fuller, Phillips-Perron and Kwiatowski-Phillips-Schmidt-Shin tests, we find that the target and effective Federal Funds rates, the treasury bills, notes and bonds, the VIX and the Federal funds futures rates are all integrated of order one. Calculated for each futures contract maturity, the unanticipated component is found out to be stationary. Standard panel unit root tests including Im-Peseran-Shin, Fisher-ADF, Fisher-PP and Hadri reveal that EMBI+ spreads as well as the credit rating index variables are integrated of order one.[8]

We estimate the following linear model to explain changes in emerging market

[8]Individual time series-based as well as panel-based unit root test results are available from the author upon request.

sovereign spreads:

$$\Delta \ln spread_{it} = \alpha_i + \gamma_1 \Delta \ln f_t + \gamma_2 \Delta r_t^u + \gamma_3 \Delta \ln VIX_t + \beta_i \Delta cr_{it} + \varepsilon_{it} \qquad (5)$$

for $i = 1, 2, .., 17$ countries and t is from January 1998 to October 2006 giving a total unbalanced panel of 1579 observations. The first explanatory variable $\Delta \ln f_t$ is the change in the Federal funds futures rate representing the anticipated component. The second variable Δr_t^u is the unanticipated component derived from the changes in the Federal funds futures rate immediately following the FOMC meetings as described before, representing the unanticipated component. The third variable is the VIX. These three variables are used to proxy the global liquidity conditions as well as the investor sentiment. *cr* is the vector of credit ratings of emerging markets and proxies the fundamental factors for each countries.

Estimation results of the unbalanced panel regression using a feasible GLS specification assuming the presence of cross-section heteroskedasticity are given in Table 3. Since apart from the unanticipated terms, the estimation involves first differences of variables entering the estimation, country specific fixed effects are eliminated. Indeed tests of redundant fixed effects confirm this and the null of redundant fixed effects cannot be rejected for all the models. normalsize[9] The coefficient standard errors are calculated using the White period robust coefficient variance estimator which is robust to arbitrary serial correlation and time-varying variances in the disturbances.

Model 1 reports results from estimating the sovereign spreads as a function of the global liquidity condition proxies (Federal funds target rate, VIX) and country specific fundamentals as proxied by credit ratings. This estimation is similar in spirit to Arora and Cerisola (2001) as well as the *2004 Global Financial*

[9]The estimated coefficients reported in Table 3 are robust to using Fixed effects estimation.

Stability Report. A decrease in the U.S. equity market implied volatility and improved fundamentals are associated with lower emerging market bond spreads. However, the Federal funds target rate is insignificant and has the incorrect sign in explaining the movements in the spread.[10] *2004 Global Financial Stability Report* also reported significant coefficient estimates for three-month U.S. dollar rate only in the post-September 2001 period when the monetary easing cycle began. Hence, the Federal funds target rate or the three-month U.S. dollar rate may not be suitable proxies for global liquidity conditions. As discussed before, the use of current Federal funds target rate is not forward looking and this may be the reason for the insignificance.

Model 2 reports results improves upon Model 1 by incorporating anticipated future interest changes through including the 3-month ahead Federal funds futures rate variable instead of the Federal funds target rate. Even though the sign of the variable is correct, the variable is insignificant at 5% level. The signs and magnitudes of the other variables are robust to this change. This estimation is similar in spirit to the *2006 Global Financial Stability Report* which reports positive and significant coefficient for the 3-month ahead Federal funds future rate variable. This difference in results could be attributed to differences in the coverage of the emerging market countries EMBI+nonstationary nature of the variables which is not analyzed in the *Report*.[11]

Models 3, 4, and 5 report estimation results using the anticipated-unanticipated interest rate changes framework introduced in the methodology section. The results conform to those reported by Kuttner (2001) and Gurkaynak et al. (2005)

[10]Similar to the aforementioned studies' findings, the estimates are robust to using effective versus target Federal funds rate.

[11]Instead of the EMBI+, EMBIG index consisting of 32 countries is used in estimations in the *Report*. Argentina, Serbia and Montenegro, Indonesia, Vietnam, Greece and Qatar are excluded from theri estimations.

that only unanticipated changes effect long-term U.S. interest rates. Indeed, independent of the maturity of the Federal funds futures rate used, unanticipated increases announced in FOMC meetings are associated with higher emerging market sovereign spreads.

4 Conclusion

This paper explores empirically the main drivers of emerging market bond spreads and adds to the existing empirical literature in two dimensions. First, we follow the news literature which finds that longer-term U.S. yields respond to unanticipated components of monetary policy actions and decompose U.S. monetary policy actions into anticipated and unanticipated components. Second, we improve on the previous empirical literature that investigated the determinants of emerging market sovereign spreads by paying special attention to the time series properties of the variables to avoid possible spurious and inconsistent regression results. Specifically using panel unit root tests, we uncover that the emerging market sovereign spreads, the Federal funds futures rates and the sovereign credit rating series are all integrated of order one. We first difference these series, rendering them stationary and then analyze the determinants of sovereign spreads.

Based on unbalanced panel feasible GLS estimation results for 17 emerging market economies, we uncover that other than country specific fundamentals and the volatility measure, the *unanticipated* component and not the *anticipated* component of the U.S. monetary policy is significant in explaining the spread movements. In particular, unanticipated rate increase announcements in FOMC meetings, a higher implied volatility and lower credit ratings are associated with higher emerging market bond spreads. This result is robust to the choice of Federal funds futures contract maturity.

The analysis suggests that even though the decline in the emerging market bond spreads since 1998 can in part be attributed to improvements in county specific fundamentals, global liquidity conditions and investor sentiment also seem to matter.

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	S&P's Rating	Assigned Score	Logistic Transformation
Upper investment grade	AAA	58	4.060
	AA+	55	2.621
	AA	52	2.005
	AA-	49	1.589
	A+	46	1.264
	A	43	0.989
	A-	40	0.744
Lower investment grade	BBB+	37	0.520
	BBB	34	0.307
	BBB-	31	0.102
Upper non-investment grade	BB+	28	-0.102
	BB	25	-0.307
	BB-	22	-0.520
	B+	19	-0.744
	B	16	-0.989
	B-	13	-1.264
Lower non-investment grade	CCC+	10	-1.589
	CCC	7	-2.005
	CCC-	4	-2.621
	CC	1	-4.060
Selective default	SD	0.25	-5.460

Notes: There are three increments for each rating to account for positive, stable and negative outlooks.

Table 1: Credit Rating Index based on Standard and Poors' Ratings

Maturity	Intercept	Anticipated	Unanticipated	R^2	SE	DW
3 month	0.13	58.07	80.89	0.40	11.18	1.99
	(0.8715)	(0.0000)	(0.0000)			
6 month	1.11	49.89	86.92	0.39	11.57	1.91
	(0.1692)	(0.0000)	(0.0000)			
12 month	1.22	32.97	85.77	0.28	13.82	1.61
	(0.2593)	(0.0071)	(0.0000)			
3 year	1.70	11.86	72.22	0.14	18.00	1.68
	(0.2332)	(0.4007)	(0.0000)			
5 year	1.63	-0.64	58.03	0.10	17.96	1.69
	(0.2530)	(0.9588)	(0.0001)			
10 year	1.33	-8.37	41.73	0.07	16.28	1.80
	(0.3023)	(0.4362)	(0.0004)			
30 year	1.46	-7.75	34.10	0.08	13.45	1.73
	(0.2697)	(0.4365)	(0.0009)			

Notes: Interest rate changes are expressed in basis points. The sample period for Treasury bills/notes with maturities from 3-month to 10-year is June 1989-October 2006, and for 30-year Treasury bond, the sample period is June 1989-February 2002. Parentheses contain the p-values.

Table 2: One month response of interest rates to target Fed funds rate changes.

Dependent Variable: Δ ln Emerging Markets' EMBI+						
01/1998-10/2006		Model 1	Model 2	Model 3	Model 4	Model 5
Explanatory Variables						
	Δ ln(Fed funds Rate)	-0.034	...	...	...	...
		(0.023)				
	Anticipated Change					
	Δ ln(1-Month FFFR)	...	...	-0.01	...	...
Global				(0.012)		
	Δ ln(2-Month FFFR)	...	...	...	-0.02	...
					(0.021)	
	Δ ln(3-Month FFFR)	...	0.048	...	...	0.011
Liquidity			(0.026)			(0.026)
	Unanticipated Change					
	1 Month-Ahead FFFR	...	...	0.087^a	...	...
				(0.029)		
Conditions	2 Month-Ahead FFFR	...	...	...	0.097^a	...
					(0.025)	
	3 Month-Ahead FFFR	...	...	...	...	0.093^a
						(0.026)
	VIX	0.422^a	0.421^a	0.421^a	0.421^a	0.423^a
		(0.023)	(0.023)	(0.023)	(0.022)	(0.022)
Pull	Credit Ratings	-0.108^a	-0.109^a	-0.109^a	-0.11^a	-0.11^a
Factors		(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
	Constant	-0.008^a	-0.008^a	-0.008^a	-0.009^a	-0.009^a
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Total Unbalanced Obs.	1579	1579	1579	1579	1579
	Adjusted R^2	0.27	0.27	0.27	0.27	0.27
	F-Statistic	194.9	195.5	147.7	148	148.4

Notes: Estimations involve feasible GLS specification assuming the presence of cross-section heteroskedasticity. The coefficient standard errors given in parentheses below each coefficient are calculated using the White period robust coefficient variance estimator. Superscript a denotes coefficient is significant at 5%.

Table 3: Unbalanced Panel Feasible GLS Estimation Results

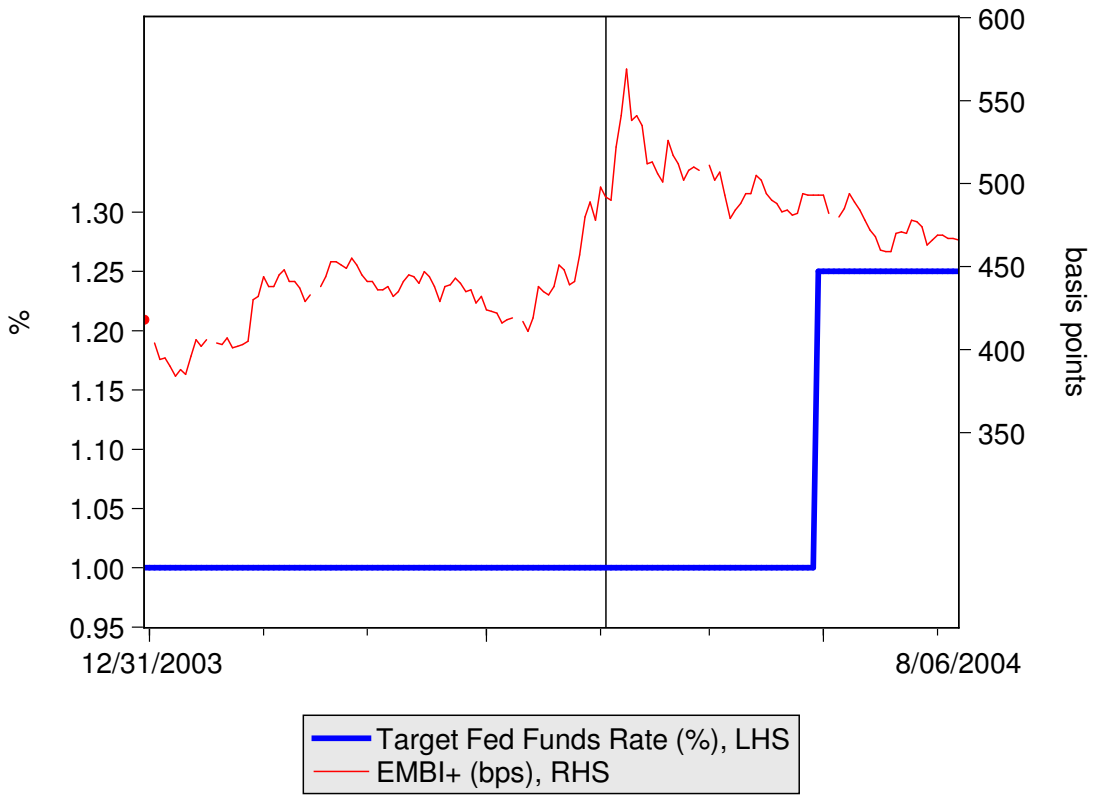

Figure 1: May 4, 2004 FOMC meeting and the EM Sell-off

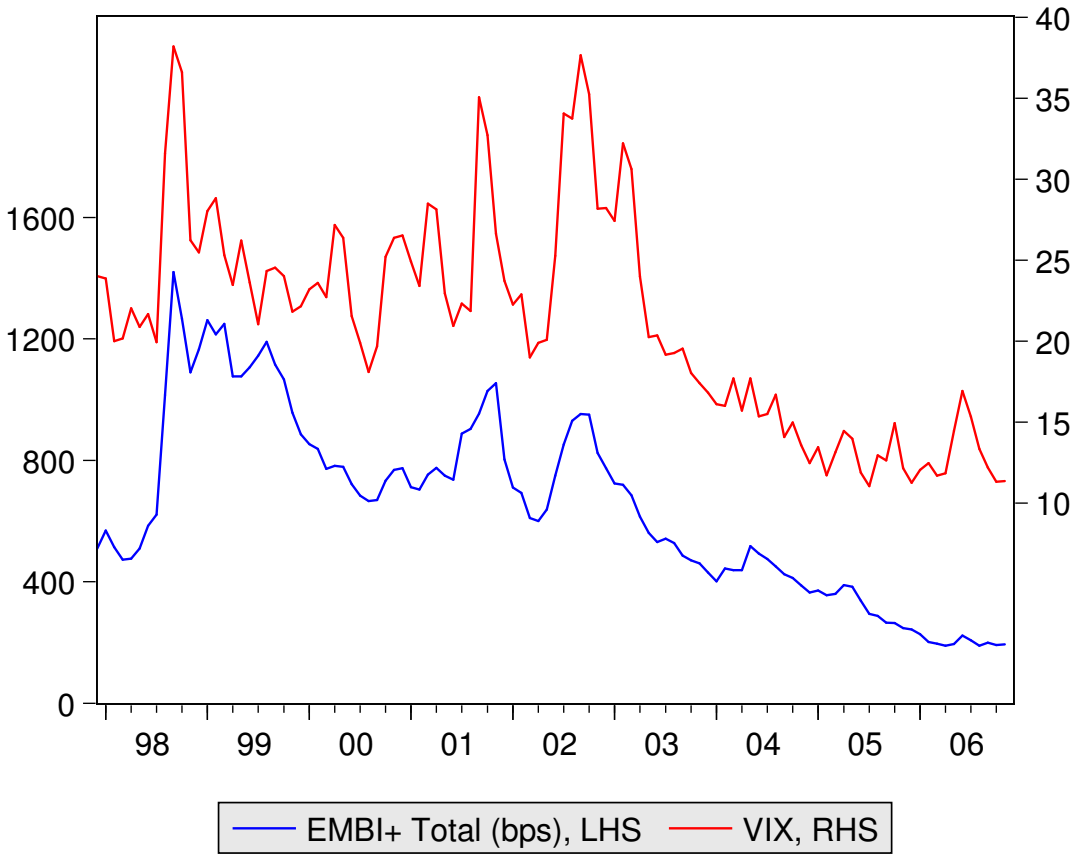

Figure 2: EMBI+ Total and the VIX