

Did it work?

The IMF and emerging markets sovereign spreads

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Abstract

This paper aims at empirically testing the Fund's claim according to which the decisions of tripling IMF resources and reforming its lending toolkit that took place in 2009 had a beneficial moderating effect on the emerging markets sovereign spreads that hiked during the financial crisis. Following the empirical literature on the determinants of spreads, a panel model is estimated taking into account the role of the Fund in 2009. The results of the empirical analysis point at confirming the effectiveness of the Fund's action in facilitating a decrease in emerging markets sovereign spreads in 2009.

1 Introduction

At the end of March 2009, the IMF approved a major overhaul of its lending framework, including the creation of a new precautionary instrument (the Flexible Credit Line), the doubling of normal access limits for non-concessional resources and the modernization of conditionality for all borrowers.

Later on that year, on April 2, G20 leaders met in London and pledged \$1.1 trillion to fight the crisis, with \$750 billion in additional funding for the International Monetary

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Fund, \$250 billion for world trade financing, and \$100 billion for multilateral development banks.

Lastly, at the end of August the IMF approved a general allocation of Special Drawing Rights (SDRs)¹ for an amount equivalent to \$250 billion in order to "achieve a significant boost in the reserves of countries with the greatest needs" (International Monetary Fund, 2009). According to the IMF, such announces and decisions have contributed to the decrease in the sovereign spreads of emerging market countries, as shown by the following graph (prepared by the IMF Strategy, Policy and Review Department and showed in multiple occasions by the Fund's officers in the last couple of years).

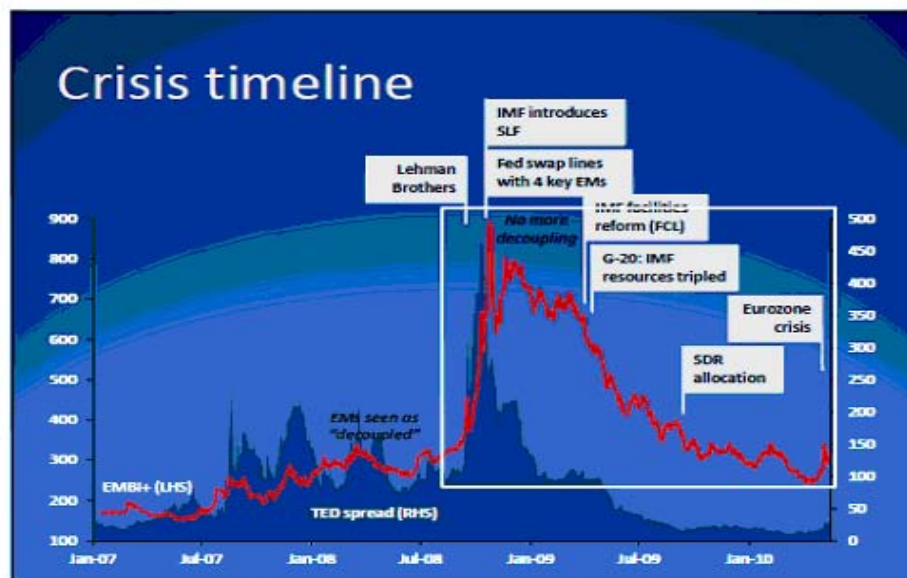


Figure 1: IMF Strategy, Policy and Review Department

¹The SDR is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves. Its value is based on a basket of four key international currencies, and SDRs can be exchanged for freely usable currencies. For more details see <http://www.imf.org/external/np/exr/facts/sdr.htm>

The same claim is made by the Fund in a 2010 paper, according to which "the combination of larger resources and more flexible lending instruments helped mitigate the risk of tail events, thus contributing to a generalized and sustained reduction in emerging market spreads, which had previously remained stubbornly high despite a rapid decline in measures of credit risk in advanced economies" (International Monetary Fund, 2010).

On the other hand, Fernandez-Arias and Levy-Yeyati (2010) challenge this view by showing qualitative evidence according to which "the widespread improvement of risk spreads after the London summit cannot be attributed to the availability of new liquidity facilities". In particular, they plot the spreads of emerging markets with potential access to the FCL² against the ones of the other countries and points to the indistinguishable performances of the two samples. The aim of this work is to empirically test such claim, by performing a panel regression on a sample of emerging market countries sovereign spreads. In particular, EMBI spread will be explained by the traditional determinants identified by the previous literature and the role of the Fund will be explored by means of adding a dummy variables to take into account the tripling and FCL announcements and by looking at the explicative power of a variable representing the Fund's resources endowment.

The question addressed in the paper is a relevant one, since the alleged success of the aforementioned Fund's actions represents the underpinning for a further expansion of the power (and consequently the resources) of the IMF in crisis prevention and resolution. In 2010, following up on the call by G20 leaders in Seoul to further explore the feasibility of a structured approach to coping with liquidity shocks of a systemic nature, the IMF proposed the creation of a so-called "Global Stabilisation Mechanism" (GSM) which would enable it to gather a huge amount of resources from member and make them available to countries in risk of distress or contagion. The debate in the

²The list of countries which have access to FCL is not disclosed by the Fund, therefore the authors define access as having prior spreads lower than the higher spread among explicitly approved countries (Colombia) and identify a subsample of 13 countries.

international fora is still at a preliminary phase on this issue, therefore to empirically test its theoretical underpinning is a relevant task at this juncture, even though I am aware that a longer sample (the last observation is 2010Q4) would provide more reliable estimates of the effects of the decisions taken in 2009.

2 Literature review

Literature on emerging markets sovereign spread determinants developed in the 1990s following the surge in bond issues by those countries and the subsequent debt crises; yet the most part of the empiric research on this issue was done in the 2000s, given the short time series available in the preceding decade.

In his seminal contribution, Edwards (1984) analyzes the determinants of the spread between the interest rate charged to a particular country and the London Interbank Borrowing Rate (LIBOR), using data on 727 public and publicly guaranteed loans granted to 19 Least Developed Countries during the years 1976-1980. He estimates a random-effect error components equation using a large set of economic and fiscal variables as explicatives. It results that both debt-output ratio and the ratio of debt service to exports have a positive effect on spreads, while the reserves to GNP ratio a negative one.

Min (1998) analyzes the economic determinants of the yield spread on fixed-income securities of the emerging economies during the 1990s, identifying several groups of important explanatory variables for the cross-country differences in bond spreads. First of all, liquidity and solvency variables are found to be significant for the yield spread determination. Specifically, these are debt-to-GDP ratio, the international reserves-to-GDP ratio, the debt service ratio and export and import growth rates. Second, some macroeconomic fundamentals are found to be significant for the bond spread determination. These include the domestic inflation rate, net foreign assets as measured by the cumulative current account, the terms of trade and real exchange rate.

Kamin and von Kleist (1999) try to explain the spread dynamics in the 1990s taking

into account the credit ratings, the features of the bond (such as liquidity, currency denomination and maturity) and external factors (such as industrial countries' interest rates); they identify different trends in spreads for emerging market debt instruments with different levels of creditworthiness and find that in the years preceding the Asian financial crisis the spreads declined more than what can be explained by improvements in risk factors alone. At the same time, they cannot find any robust positive linkage between emerging market spreads and industrial countries' interest rates, suggesting that the main cause for the decline in emerging market spreads was a mix of globalization and the dissipation of Mexican financial crisis in late 1990s.

On the same line, other studies attempt to explain the decline in spreads that took place between late 1990s and late 2000s. For example, Hartelius and Kodres (2008) study the relative role of global liquidity and improved economic fundamentals in explain such decline, using the FED Funds future rate, their volatility and the Volatility Index (VIX) to account for the former and some creditworthiness indexes to account for the latter. They find that both factors have a role in explained spread dynamics. Gonzales-Rosada and Levy-Yeyati (2006) show that a large fraction of the time variability of emerging market bond spreads is explained by the evolution of global factors such as risk appetite, global liquidity and contagion from systemic events such as the Russian default, while Ciarlone *et al.* (2009), using factor analysis, find that a single common factor (identified in the financial market volatility) is able to explain a large part of the co-variation in emerging market economies between 2002 and 2007.

Other - more recent - works focus on the possible explicative power of a particular set of variables such as those related to fiscal adjustment (Akitoby and Stratmann, 2008), financial volatility (Bellas *et al.*, 2010), political risk (Baldacci *et al.*, 2008) and investment grade status (Jaramillo and Tejada, 2011).

Akitoby and Stratmann (2008), using panel data from emerging market countries, find that revenue-based adjustment lowers spreads more than spending-based adjustment does; they also show that debt-financed current spending increases sovereign risk, while tax-financed current spending lowers spreads, suggesting that international investors

prefer the latter. In addition, they find strong evidence that fiscal variables interact with political institutions to affect financial markets. Bellas *et al.* (2010) use a fixed-effects model and the pooled mean group (PMG) estimation technique to distinguish short- from long-term effects, allowing the short-run parameters to vary across countries. Their regressions suggest that in the short run, financial fragility is a more important determinant of spreads than fundamental indicators, while fundamentals and political risk are significant long-run determinants. Baldacci *et al.* (2008) estimate a basic spread model on a 30 emerging market countries spreads data, using fixed and random effects estimators. The potential endogeneity and omitted variable bias of the explanatory variables is dealt with by using an instrumental variable estimator (both 2-stage least squares and Generalized Method of Moments). Their results show that political risk factors, including expropriation risk, play a significant role in raising sovereign spreads as financial markets require an extra premium for political instability, even though fiscal variables are more important and have a larger impact on spreads. The paper finds that investment grade status reduces financing costs significantly. Jaramillo and Tejada (2011) use a panel dataset for 35 emerging market economies for the period 1997-2010, and base the analysis for sovereign spreads on a fixed effects model with robust standard errors. The econometric results indicate that sovereign spreads for investment grade countries are 36 percent lower than for speculative grade countries, above and beyond what is implied by macroeconomic fundamentals. While global financial conditions play a central role in determining the variability of spreads, lower external public debt to GDP levels improve market sentiment, even more so for lower rated sovereigns. Stronger real GDP growth helps reduce borrowing costs, while higher international reserves lead to lower spreads only in the case of speculative grade countries.

This paper fits into this literature of sovereign spreads determinants and exploits the standard framework to add some consideration about the role of the IMF by including variables related to its reform announcement after the 2008-2009 crisis and to its resources endowment.

3 What did it happen in 2009?

There are three different arms in the IMF action in 2009 that must be taken into account and whose effects on the emerging market sovereign spreads I want to test: first, on March 24, the IMF announced a major lending policy reform to help countries dealing with the effect of the global economic downturn; second, on April 2, at the Group of Twenty meeting in London, the Leaders decided to triple IMF resources from \$250 to \$750 billion; third, at the end of August IMF approved a general allocation of SDRs for an amount equivalent to \$250 billion. In what follows, each one of these measures is described in more detail.

The reform of the lending framework The overhaul of the lending framework comprised the following measures, the most important of which is the creation of the Flexible Credit Line (FCL):

- Flexible Credit Line (FCL). It is a precautionary credit line which allows countries with very strong fundamentals, policies, and track records of policy implementation to draw on it at any time. Countries meeting pre-set qualification criteria³ (the so-called *ex ante* conditionality) are entitled to uncapped and upfront access to Fund resources with no (*ex post* conditions. Access under the FCL is determined on a case-by-case basis. Disbursements under the FCL are not phased or conditioned to policy understandings as is the case under a traditional Fund-supported program. This flexible access is justified by the very strong track records of countries that qualify for the FCL, which give confidence that their

³The relevant criteria for assessing qualification to an FCL arrangement include: (i) a sustainable external position; (ii) a capital account position dominated by private flows; (iii) a track record of steady sovereign access to international capital markets at favorable terms; (iv) a reserve position that is relatively comfortable when the FCL is requested on a precautionary basis; (v) sound public finances, including a sustainable public debt position; (vi) low and stable inflation, in the context of a sound monetary and exchange rate policy framework; (vii) the absence of bank solvency problems that pose an immediate threat of a systemic banking crisis; (viii) effective financial sector supervision; and (ix) data transparency and integrity. Strong performance against all these criteria would not be necessary to secure qualification under the FCL, as compensating factors, including corrective policy measures under way, would be taken into account in the qualification process.

economic policies will remain strong.

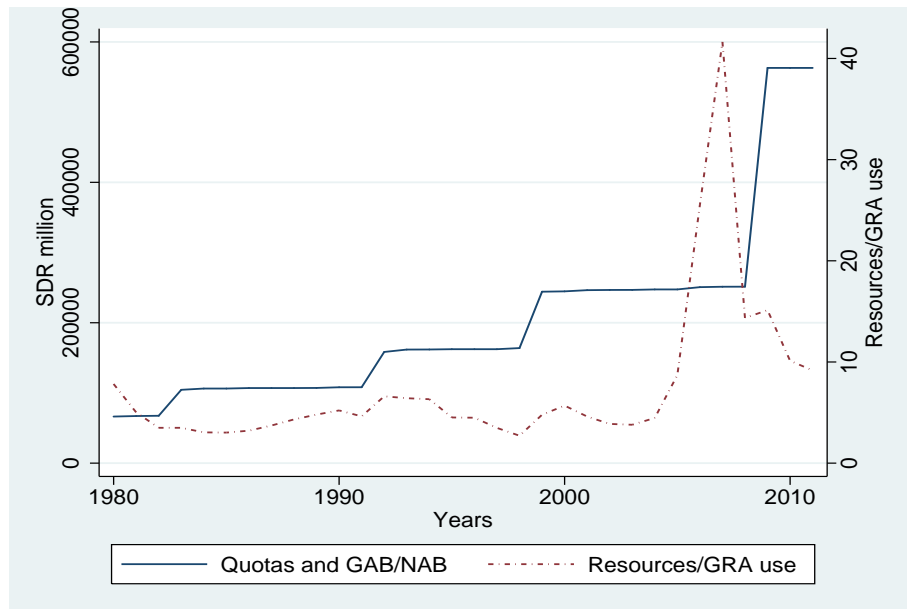
So far three countries have requested the FCL: Mexico (April 2009), Poland (May 2009) and Colombia (November 2009); all of them have renewed the credit line for another year at its expiration and none has yet withdrawn the resources made available by the Fund.

- Modernizing conditionality. First, the IMF will rely more on *ex ante* conditionality where appropriate rather than on *ex post* conditionality as the basis for providing countries access to Fund resources. Second, implementation of structural policies in IMF-supported programs will be monitored in the context of program reviews, rather than through the use of structural performance criteria, which will be discontinued in all Fund arrangements, including those with low-income countries.
- Enhancing Stand-by Arrangements (SBA). Reforms to the SBA (the Fund's most important lending instrument for crisis resolution) aim to increase its flexibility and ensure its availability as a crisis prevention instrument for members that may not qualify for the FCL. The new SBA framework will enable high-access on a precautionary basis and provide increased flexibility by allowing frontloading of access and reducing the frequency of reviews and purchases.
- Doubling access limits. Non-concessional loan access limits for countries have been doubled, with the new annual and cumulative access limits for Fund resources being 200 and 600 percent of quota, respectively. These higher limits aim to give confidence to countries that adequate resources would be accessible to them to meet their financing needs. Access above these limits will continue to be provided on a case-by-case basis under Exceptional Access procedures, which have also been clarified and streamlined.
- Other reforms. They include the simplification of cost and maturity structures, the elimination of some facilities that have not been recently used (the Supplemental Reserve Facility and the Compensatory Financing Facility) and the reform

of concessional lending toolkit for Low Income Countries (LICs).

The tripling of the resources As a key part of efforts to overcome the global financial crisis, on April 2 2009, the G20 agreed to increase the resources available to the IMF by up to \$500 billion (which triples the total pre-crisis lending resources of about \$250 billion) to support growth in emerging market and developing countries. This broad goal was endorsed by the International Monetary and Financial Committee in its April 25 2009 communiqué and the resource increase was made in two steps: first, through bilateral financing from IMF member countries; second, by incorporating this financing into an expanded and more flexible New Arrangement to Borrow (NAB)⁴. On September 25 2009 the G20 announced it had delivered on its promise to contribute over \$500 billion to a renewed and expanded NAB. The following graph shows the historic pattern of IMF resources (given by the sum of quotas subscribed by members and arrangements to borrow) in absolute value and scaled on the outstanding credit in the General Resources Account (GRA), which is the account through which the IMF finances all its non-concessional lending. Data shows that the resources increase that took place in 2009 was indeed relevant with respect to the historical trend. Incidentally, it is interesting to note that after an initial spike of the ratio of resource to outstanding lending, such figure falls sharply, reflecting a major revamp of IMF lending during and after the global financial crisis.

⁴The NAB is a credit arrangement between the IMF and a group of member countries and institutions through which the IMF borrows additional resources and increases its lending capacity to forestall or cope with an impairment of the international monetary system.



The SDR allocation Against the backdrop of the global financial crisis, on August 28 2009, the IMF implemented a \$250 billion general allocation of SDRs, which summed up to an existing stock of about \$50 billion. Nearly \$115 billion of this allocation went to emerging market and developing countries, including about \$20 billion to low-income countries (LICs). The SDRs are a potential claim on the freely usable currencies of Fund’s members, hence they represent a form of unconditional liquidity, which can be used to acquire ”strong“ currencies from other members in case of balance of payments need or to settle transactions and operations between Fund members and the General Resources Account.

4 The empirical analysis

4.1 The data

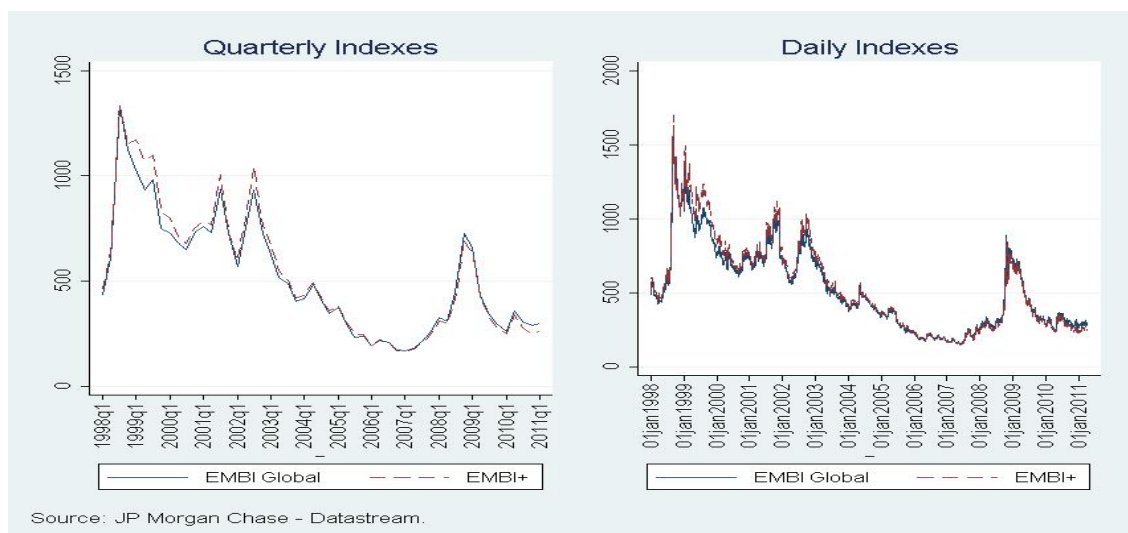
The dependent variable The dependent variable is the emerging market bond spread (EMBI). The most used series are EMBI+ and EMBI Global, both provided by

JP Morgan Chase. Both series track total returns for traded external debt instruments (external meaning foreign currency denominated fixed income) in the emerging markets, but they differ for the criteria used for inclusion⁵, hence they cover different time periods and countries, as reported in Table 1. Here I consider stripped spreads which show the yield difference in basis points over US Treasuries of a JPMorgan emerging market bond index (EMBI), stripping out any credit enhancements such as principal and/or interest collateral.

Despite the differences in country inclusion, the two series feature a very similar pattern, as showed in the graph below, where the composite EMBI Global and EMBI+ indexes are confronted both on a daily and on a quarterly base. In this empirical analysis I choose to use EMBI Global as dependent variable for its wider inclusion of countries. The dataset covers 44 emerging market countries with quarterly data from 1994 to 2010 (66 periods), comprising a total of 2992 observations⁶.

⁵Instruments in the EMBI+ must have a minimum face value outstanding of \$500 million and must meet strict criteria for secondary market trading liquidity, while countries are selected according to a sovereign credit-rating level . EMBI Global instead defines emerging markets countries with a combination of World Bank-defined per capita income brackets and each country's debt-restructuring history. These two criteria allow the EMBI Global to include a number of higher-rated countries. Also, EMBI Global's secondary market liquidity constraints are much more relaxed than EMBI+, and results in the inclusion of nearly twice as many instruments than the EMBI+.

⁶Not every variable is available for all countries or for the full time period.



The explicative variables I take from the existing literature the variables for explaining the emerging markets sovereign spreads and group them in four sets depending on the main economic features they are meant to capture⁷:

- Solvency: Debt on GDP, Current account balance on GDP, overall fiscal balance on GDP;
- Liquidity: Reserves on GDP, Current account balance on reserves;
- Macroeconomic conditions: GDP growth, Consumer price inflation, Openness;
- Political environment: State fragility index, Political stability index
- Global factors: VIX volatility index, US Treasury bill rate

The role of the Fund is captured by the announcements dummy taking value starting from 2009Q2, by the total Fund resource variable (which includes quota plus borrowing arrangements such as General and New Arrangements to borrow). If the measures

⁷The inclusion of a variable of in one group or another is not always straightforward (Debt on GDP, for example, could affect both solvency and liquidity), but this taxonomy only helps exposition, without having any impacts on the underlying empirical model

adopted in 2009 really played a role in the decrease of emerging markets spreads, I expect the coefficient of the dummy variable to be negative and significant; if the size of the Fund is relevant for the spreads, I also expect a negative and significant coefficient for the resources variable, meaning that an enlargement of the Fund's endowment counts in decreasing sovereign risk. In addition, a dummy variables is included to take into account the three countries that requested the FCL in 2009 (Mexico, Poland and Colombia) to check if the actual subscription of the facility has influenced in any way the spreads. The variables used for this analysis are summarized in Table 2, and the other variables used for computation in Table 3.

All variables in national currency or SDRs are converted into US dollar using IFS quarterly exchange rates. Annual variables have been interpolated. For countries whose GDP quartely data are not available, annual data have been interpolated; those countries are: Belize, Cote d'Ivoire, Dominican Republic, Gabon, Ghana, Iraq, Lebanon, Nigeria, Serbia, Sri Lanka, Uruguay, Venezuela, Vietnam.

4.2 The theoretical background

The theoretical background of this analysis exploits a simplified version of the empirical model developed by Edwards (1984) and reprised by the following literature (i.e. Akitoby and Stratmann (2008) and Bellas *et al.* (2010)). I assume that a risk-neutral investor lends to a given country which is price-taker in the capital market. The rule for an optimal portfolio allocation for the investor is

$$(1 + r^*) = \pi d + (1 - \pi)(1 + r^L) \quad (1)$$

where r^* is the international risk-free interest rate, π is the probability of default of the borrowing country, d is the payment the investor receives in case of default and r^L is the lending rate which comprises the risk-free interest plus a spread s . Solving the above equation for s yields

$$s = \frac{\pi}{1 - \pi}(1 + r^* - d) \quad (2)$$

The 2009 announcements on a larger resources endowment for the Fund and the creation of the FCL are thought to help countries dealing with financial and economic distress hence the intervention of the Fund should have the twofold effect of decreasing the probability of default π and increase the payment d that the country is able to make in case of default.

4.3 Results and robustness checks

The empirical model entails estimating the following equation:

$$s_{it} = \alpha_i + \sum_k \beta_k x_{it} + \gamma_1 IMF_t + \gamma_2 FundRes_t + e_{it} \quad (3)$$

where the explicatives x_{it} include (depending on the specification) the above described variables, IMF_t is the the dummy variables accounting for the 2009 IMF/G20 announcements (i.e. the FCL creation and the tripling decision). To further characterize the role of the Fund in determining emerging markets sovereign spreads, the variable $FundRes_t$ of Fund's total resources and a dummy variable FCL to identify the three countries that actually requested a FCL are included.

I estimate with OLS a country fixed effects panel model (hence the term α_i), consistently with the result of the Hausman test performed on the most general specification of the model, which rejects the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. This choice is also backed up by Baltagi (1995) who comments that the fixed effects model is an appropriate specification if the model is taking a specific set of individuals, for example emerging markets. To check if time fixed effects are needed I run a model with dummies for each quarter and test their overall significance; since the F-test failed to reject the null hypothesis that the dummies' coefficients are jointly equal to zero, I ruled out the need for time fixed effects. The presence of a unit root in the dependent variable is ruled out by both Dickey-Fuller and Philips-Perron tests, so no lag tranformation is deemed necessary on the quarterly spread variable. To

decide on the proper specification of the model, I performed a modified Wald test for groupwise heteroskedasticity in fixed effect regression model and the null hypothesis of homoskedasticity was rejected; also the Wooldridge test for autocorrelation in panel data rejects the null of no first-order autocorrelation. Therefore the standard errors estimates are robust to disturbance being heteroskedastic and autocorrelated.⁸

In the first set of regression (Table 4) the dummy variable *IMF* is the one accounting for the Fund's role, in the second (Table 5) it is the resource variable *FundRes*⁹. The signs of the significant variables are as expected; in particular, the IMF dummy variables results to be negative and significant across all specifications, indicating that the measures take by the Fund in the second quarter of 2009 contributed to give confidence to the markets and influenced negatively the EMBI Global spreads for the countries in the sample. The estimates displayed in Table 5 show that the increase of Fund resources contributed too to this dynamic, although the result appears to be less robust across different model specifications. The relevance of the *FCL* is very weak and, according to this analysis, the effect of the request of an FCL, if any, has been positive on the spreads, pointing to the well-known stigma problem linked to the IMF precautionary facilities.

As robustness checks, I tried many more specifications of the model, including all the variables in the dataset, and the two main results continue to hold. In addition, a model using the log of the spreads as dependent variable was estimated and confirmed the main findings.

5 Conclusions

The aim of this paper was to empirically test the Fund's claim according to which the decisions of tripling IMF resources and reforming its lending toolkit that took place

⁸The same fixed effect panel model with robust standard errors is estimated by Jaramillo and Tejada (2011), who have a similar dataset to the one used in this paper, both in terms of countries and years inclusion. The main difference is that they use annual variables, while here quarterly data are considered.

⁹The two variables are not used in the same regression to avoid collinearity issues.

in 2009 had a beneficial moderating effect on the emerging markets sovereign spreads that hiked during the financial crisis. I applied a country fixed effect panel model with robust standard errors on a sample of emerging countries sovereign spreads, using as explicatives the most relevant economic variables identified by the previous literature on this issue. According to this empirical analysis the intervention of the Fund through the reform of its lending toolkit and the decision of augmenting its resource endowment has indeed had the claimed diminishing effect on emerging market countries' spreads. The main limit of this study rests in the short time period taken into account after the realization of the event whose significance I wanted to test (from 2009Q2 to 2010Q4, 7 periods). Nonetheless, the timing for such analysis - even if preliminary - is right at the current juncture, in which countries are debating within international fora on the opportunity of further increasing the role and the resource endowment of the IMF. This analysis suggests that the point of a Fund's "empowerment" can be backed by some preliminary empirical evidence on the effectiveness of its action in times of crisis but still more work is needed to reach a solid conclusion on this issue.

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Table 1: Availability of EMBI+ and EMBI Global

<i>Country</i>	<i>EMBI+</i>	<i>EMBI Global</i>
Composite Index	1997Q4	1997Q4
Argentina	1993Q4	1993Q4
Belarus	n.a.	2010Q3
Belize	n.a.	2007Q1
Brazil	1994Q2	1994Q2
Bulgaria	1994Q3	1994Q3
Chile	n.a.	1999Q2
China	n.a.	1994Q1
Colombia	199Q2	1997Q1
Cote d'Ivoire	n.a.	1998Q2
Croatia	n.a.	1996Q3
Dominican Republic	n.a.	2001Q4
Ecuador	1995Q1	1993Q3
Egypt	n.a.	2000Q2
El Salvador	n.a.	2001Q1
Gabon	n.a.	2006Q4
Georgia	n.a.	2007Q2
Ghana	n.a.	2006Q3
Hungary	n.a.	1997Q4
Indonesia	2006Q4	2003Q1
Iraq	n.a.	2005Q1
Jordan	n.a.	2009Q4
Kazakhstan	n.a.	2006Q2
Lebanon	n.a.	1998Q2
Lithuania	n.a.	2009Q4
Malaysia	n.a.	1996Q4
Mexico	1994Q4	1993Q4
Nigeria	n.a.	1993Q4
Pakistan	n.a.	2001Q2
Panama	1996Q3	1996Q3
Peru	1997Q1	1997Q1
Philippines	1999Q2	1997Q4
Poland	n.a.	1994Q4
Russia	1997Q3	1997Q4
Serbia	n.a.	2005Q4
South Africa	2002Q2	1994Q4
Sri Lanka	n.a.	2007Q4
Trinidad Tobago	n.a.	2007Q2
Tunisia	n.a.	2002Q2
Turkey	1999Q3	1996Q2
Ukraine	1999Q3	2000Q2
Uruguay	n.a.	2001Q2
Venezuela	1993Q4	1993Q4
Vietnam	n.a.	2005Q4
Jamaica	n.a.	2002Q4

Table 2: Explicative variables

Variable	Description	Frequency	Source
DEBTonGDP	General government gross debt as percent of GDP	Annual	WEO
ov_fisc_bal	General government net lending/borrowing as percent of GDP	Annual	WEO
CABonGDP	Current account balance as % of GDP	Calculated	WDI/IFS
RESonGDP	International Reserves as % of GDP	Calculated	WEO
CABonRES	Current account balance as % of international reserves	Calculated	WDI/IFS
GDPgrowth	% growth rate of GDP at market prices	Annual	WDI
CPIinf	Consumer Price Index annual % change	Quarterly	IFS
Openness	Export+Import as percent of GDP	Calculated	IFS
SFI	State Fragility Index (ranging from 1 to 25)	Annual	Polity IV
PolStab	Political stability and absence of Violence	Annual	WBG
UStre	US Treasury bill rate	Quarterly	IFS
VIX	Quarterly average of close daily S&P 100 volatility index	Daily	CBOE
USEofGRA	Use of Fund credit: General Resources Account	Quarterly	IFS
IMF	Dummy variable taking value from 2009q2	Calculated	
FundRes	Fund resources: quotas + borrowing arrangements in	Quarterly	IFS

Table 3: Variables used for calculations

Variable	Description	Frequency	Source
GDP	Gross domestic product in millions of national currency	Quarterly	IFS
EXP	Exports of goods and services in million of national currency	Quarterly	IFS
IMP	Imports of goods and services in million of US\$	Quarterly	IFS
RES	International Reserves in millions of SDRs	Quarterly	IFS
XR.SDR	National currency for SDR	Quarterly	IFS
XR.USD	National currency for USD	Quarterly	IFS
cur_acc_bal	Sum of net exports in current US\$	Annual	WDI

Table 4: Regression table

	(1)	(2)	(3)	(4)	(5)
	SPR	SPR	SPR	SPR	SPR
RESonGDP	-12.15*** (3.157)	-12.08*** (3.098)	-11.30*** (3.121)	-1.475 (3.353)	-1.313 (3.397)
GDPgrowth	-39.05*** (5.779)	-40.02*** (5.761)	-31.14*** (6.787)	-27.71*** (6.608)	-27.77*** (6.630)
CABonGDP	636.0** (306.3)	635.2** (307.1)	644.1** (303.9)	525.9* (259.5)	528.4* (259.6)
IMF	-299.0*** (63.91)	-297.6*** (63.43)	-313.1*** (67.41)	-212.1*** (60.91)	-232.7*** (66.89)
CPIinf		0.159** (0.0679)	0.176** (0.0713)	0.168 (0.397)	0.165 (0.397)
VIX			8.072** (3.512)	9.122*** (3.317)	9.137*** (3.320)
SFI				69.78*** (22.53)	69.97*** (22.65)
FCL					160.3* (82.27)
_cons	786.0*** (25.78)	786.5*** (25.48)	574.5*** (88.04)	-90.37 (225.9)	-92.38 (227.1)
adj. R^2	0.067	0.071	0.080	0.100	0.099
AIC	20488.0	19983.1	19971.2	19359.8	19361.3
BIC	20508.7	20008.9	20002.1	19395.7	19402.2
N	1311	1277	1277	1241	1241

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Regression table

	(1)	(2)	(3)	(4)	(5)
	SPR	SPR	SPR	SPR	SPR
RESonGDP	-10.70*** (2.903)	-10.72*** (2.865)	-9.587*** (2.776)	-1.134 (3.117)	7.505 (5.720)
GDPgrowth	-37.64*** (5.841)	-38.59*** (5.845)	-29.02*** (6.755)	-26.48*** (6.597)	-22.99 (14.24)
CABonGDP	643.4** (302.1)	645.3** (304.0)	657.8** (300.3)	530.4** (257.7)	-290.0 (238.9)
FundRes	-0.793*** (0.248)	-0.772*** (0.248)	-0.863*** (0.249)	-0.429 (0.262)	0.0542 (0.249)
CPInf		0.132* (0.0702)	0.145* (0.0726)	0.138 (0.383)	8.280 (5.645)
VIX			8.670** (3.498)	9.254*** (3.333)	5.452 (3.442)
SFI				69.17*** (24.88)	67.86 (42.27)
DEBTonGDP					26.32*** (9.513)
FCL					-128.8 (88.40)
_cons	971.6*** (76.95)	966.8*** (77.02)	761.5*** (105.9)	9.506 (281.1)	-1340.7** (528.5)
adj. R^2	0.067	0.070	0.081	0.097	0.456
AIC	20487.3	19983.3	19969.4	19363.3	16018.2
BIC	20508.0	20009.1	20000.3	19399.2	16062.9
N	1311	1277	1277	1241	1063

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$