FUNDAMENTALS OR DISCRIMINATION: WHAT CAUSES COUNTRY RISK?

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Resumo – O risco país como medido pelo Embi+ do JP Morgan ou pelas notas das agências de *rating* nem sempre parecem refletir os fundamentos da economia. Freqüentemente países que seguem políticas econômicas sólidas são classificados no mesmo nível de países com orientações populistas ou com uma história recente de *default* ou de reestruturação de dívida, o que gera um sentimento desconfortável com respeito a estas avaliações. O objetivo deste trabalho é investigar se estes indicadores refletem os fundamentos de mercado ou se é possível identificar algum tipo de preconceito ou intolerância com relação a certos países. A decompsoição de Oaxaca-Blinder é utilizada para analisar as diferenças no risco país, como medida pelo Embi+ para um grupo de países emergentes. A decomposição permite separar diferenças "justificáveis" isto é, as que são baseadas em diferenças de fundamentos das "não justificáveis", que são as resultantes dos fundamentos serem avaliados de forma diferente. De 19 países na amostra, 9 exibiram risco mais altos do que os preditos por seus fundamentos: Argentina, Venezuela, Ucrânia, Peru, México, Coréia, Colômbia e Rússia.

Palavras chave: Risco País, Decomposição de Oaxaca-Blinder, Mercados Emergentes.

Abstract: Country risk as measured by JP Morgan's Embi or by the grades of rating agencies such as S&P's or Moody's does not always seem to reflect the fundamentals of the economy. Frequently countries that pursue sound economic policies are placed on the same level as countries with a populist orientation or with a recent history of default or debt restructuring, which generates a feeling of unease with regard to these evaluations. The objective of this paper is to investigate whether these indicators reflect market fundamentals or whether it is possible to identify some kind of prejudice or intolerance towards certain countries. We use the Oaxaca-Blinder decomposition to analyze the differences in country risk, as measured by the Embi+ for a group of emerging markets. This decomposition allows us to separate "justified" differences, due to differences in fundamentals, from "unjustified" ones, due to the same fundamental being evaluated differently. Out of the 19 countries in the sample, 9 exhibit higher spreads than are predicted by their fundamentals: Argentina, Venezuela, Ukraine, Peru, Mexico, Korea, Brazil, Colombia and Russia.

Key Words Country Risk, Oaxaca-Blinder Decomposition, Emerging Markets

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Fundamentals or Discrimination: What Causes Country Risk?

Abstract

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1. Introduction

Country risk has become an increasingly important factor in macroeconomics in recent years with the integration of international capital markets. In many aspects the degree of freedom of monetary and fiscal policy is constrained by country risk since the economy's external balance depends on this variable. From a theoretical point of view the determination of country risk is still in its early stages but there is some consensus that the economy's economic fundamentals determine its risk. Nevertheless, there have been too many cases where countries with fragile fundamentals or with a history of recent defaults have been evaluated as being less risky than countries that exhibit more solid conditions. The questions this paper aims to answer are as follows: Is country risk determined by fundamentals or by sentiment? Are the criteria used to determine country risk the same for all countries or are some countries treated with a certain kind of intolerance? Which countries are the most discriminated against in terms of the determination of their country risk?

The determinants of emerging markets bonds spreads have been analyzed by a number of authors over the course of the last twenty years. One of the first such works was by Edwards (1986) who analyzed the bond markets for 13 developing countries during 1976-1980, a period when most LDC debt consisted of bank loans. He found evidence that the debt to GDP ratio had a positive effect on bond spreads. More recent studies have the benefit of much larger bond markets for these countries.

Liquidity and solvency indicators play a role in bond spreads. For instance, Min (1999) found that the ratios of external debt, international reserves and debt service to GDP along with export and import growth rates were significant for a group of Latin America and Asia countries during the 1991-1995 period. Other macro variables such as the inflation rate, terms of trade, real exchange rate and net foreign asset accumulation also helped to explain these spreads in his sample. On much the same lines is the work produced by Fiess (2003) who separates contagion from country specific fundamentals for the joint determination of capital flows and country risk for four Latin American countries in the 1990s. He found that capital flows were driven by both country risk and global factors while country risk was solely determined by a number of fundamental variables: the ratio to GDP of primary balance and public debt. Back (2001) estimating a panel data found that during the period immediately following the Asian crises the spreads were "almost entirely explained by expectations of market fundamentals". In developed countries international interest rates also played a role but stock market volatility did not.

Eichengreen and Mody's (1998) analysis attempted to separate the impact of changes in fundamentals from that of changes in market sentiment regarding LDC' bond spreads. They controlled for the selective bias of new issuers and found that changes in fundamentals explained the change in spreads but that, the same explanatory variables

had a different impact in different periods: market sentiment played a stronger role during the Mexican crises (increasing spreads) and in the subsequent period (declining spreads) than during the previous period. Also, the responses of spread to fundamentals in Latin American countries were different from those observed in other countries that were included in the sample.

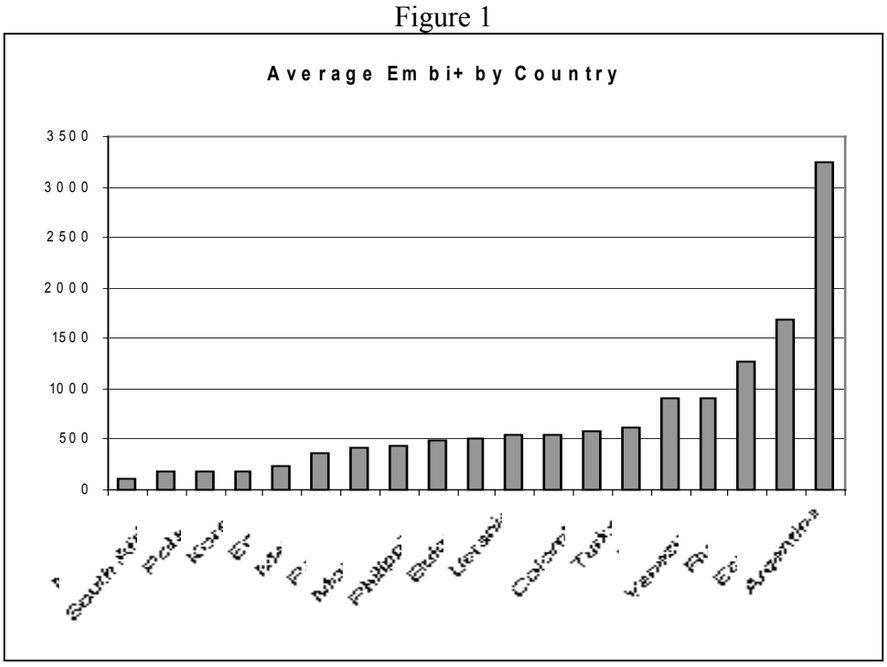
On the same lines, Reinhart, Rogoff and Savastano (2003) analyzed why it is more difficult for some countries to repay their debts at levels that would be considered moderate for other countries. They build a measure of debt intolerance based on an estimated risk regression, using the ratings of the Institutional Investor Ratings as a function of fundamentals and the default history of the countries.

The present paper is more in line with Eichengreen and Mody (1998), and Reinhart, Rogoff and Savastano (2003). We estimate a risk regression based on the fundamentals and default history of the countries and use the coefficient of this regression to compute how much of the difference in spreads can be attributed to the difference in country risk and how much to sentiment, intolerance or discrimination. In addition to this introduction, section 2 presents some stylized facts regarding the economies being analyzed, section 3 presents the estimates while the last section, presents the final considerations.

2. Stylized Facts

JP Morgan's Embi + measures the difference in bond spreads vis-à-vis US Treasury Bills of the same maturity, for countries that are ranked as Baa1/BBB+ or below by Moody's and S&P rating agencies and some liquidity ranking rules. As Figure 1 below shows, for the period from Dec 1998 to Dec 2004 there is a huge difference in the spreads exhibited by the countries in the sample[1]: ranging from 3241 base points for Argentina to 111 for Malaysia.

Figure 1



When we look at the relationship between the Embi+ indicator and a number of macro variables we observe that for the most part correlations are in the predicted directions. In order to measure the liquidity/solvency conditions of the countries we use the ratio between exports and public debt. As can be seen in Figure 2 both, the average embi together with its variance declines with this indicator.

[1] The Embi+ has been computed since 1993 and many countries have already been excluded from the sample for not meeting the standards. The above countries, plus Qatar and Nigeria, are the ones in the sample today.

Figure 2

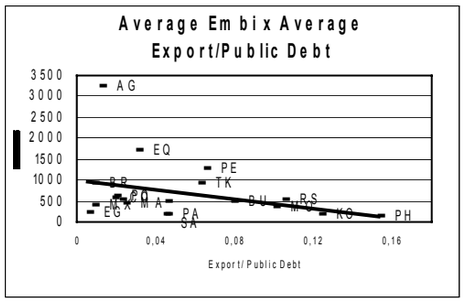
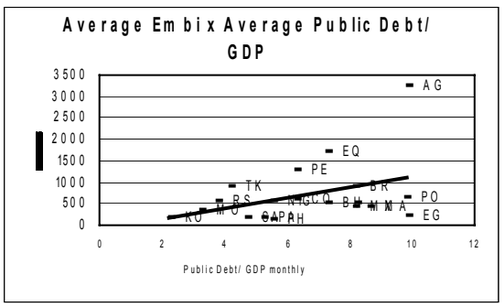


Figure 3



In order to capture the fiscal fundamentals we calculate the ratio of public debt to GDP. Figure 3 shows that the higher this ratio is the higher the Embi result. But, once again we observe that this variance also increases with the debt ratio.

For other variables that capture domestic fundamentals we see in Figure 4 that there is a slight positive correlation between interest rates and the country risk, with a declining variance and, in Figure 5, a negative correlation between this variable and the GDP growth rate.

Figure 4

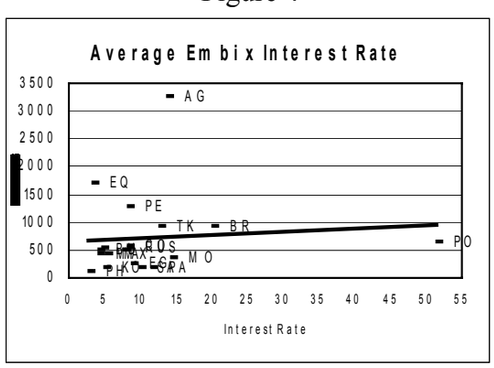
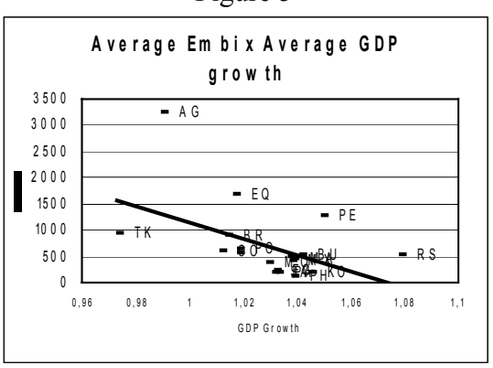


Figure 5



The default history can be measured by the number of times that each country has defaulted. In general in our sample, we find that those countries which have never defaulted, namely Korea and Malaysia, had an average embi 5 times lower than those countries which have already repudiated or restructured their debts. There is also, as we can see from Figure 6, a positive relationship between the number of defaults and the average Embi although in the extreme cases of Venezuela and Ecuador, which have each registered seven defaults, the average embi is lower than that exhibited by Argentina, which has registered six defaults. But, as is pointed out by Reinhart, Rogoff and Savastano (2003) a better measure for the correlation of country risk would be the length of time since the last default or restructuring. Figure 7 shows the Embi figures as in December 2004 and the number of months since the last default. Argentina, Ecuador, Russia and Ukraine are the most recent countries to have defaulted.

Figure 6

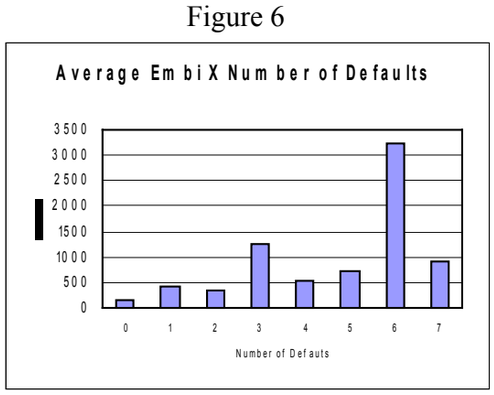
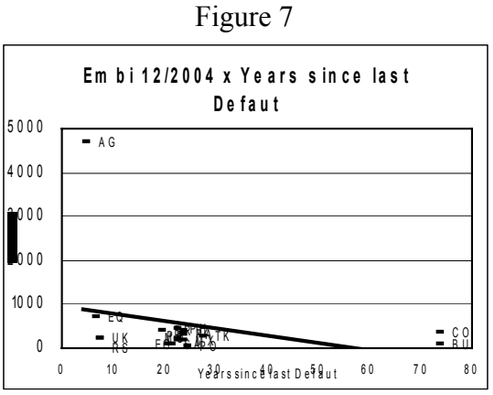


Figure 7



Following the same authors we also calculated debt intolerance as measured by the inverse of the lapse (length) of time since the last default[2] multiplied by the ratio of public debt to GDP. The correlation of this index with the embi is highly positive as can be seen in figure 8. With respect to the bond market we note in Figure 9 that there is a slight positive correlation between the average spreads and average duration for the countries in the sample and that the variance increases with duration.

Figure 8

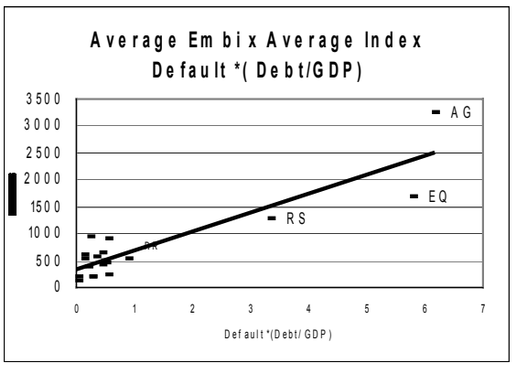
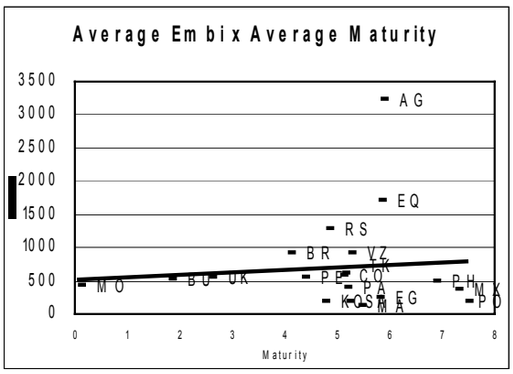


Figure 9



All these facts confirm the expectation that country risk is highly determined by fundamentals. Nevertheless some countries are systematically over the trend line, while others are frequently above it. Brazil's Embi, for instance, is frequently over it, indicating that its country risk is higher than that predicted by fundamentals. On the other hand, Egypt has a lower country risk than that predicted by its fundamentals since it is frequently below the trend lines.

3. Estimation and Results

With the aim of measure the impact of fundamentals on country risk we estimated a panel of 19 countries using monthly data for the period Dec 1998 to Dec 2004. As a second step we estimate the same model for each country and then, using an Oaxaca-Blinder methodology, we decompose the differences in country risk into two components: the part explained by fundamentals and the part explained by discrimination. This methodology was used to capture the effects of this kind of sentiment on different spreads over different periods in Eichengreen and Mody's study (1998). We adopt the same strategy, but use it specifically to compare country risks between economies. The decomposition is carried out via a comparison of each country with the pool of countries in the sample. This benchmark is specially opportune to our purpose, once we can capture the differences in criterion comparing similar economies in terms of fragility of their institutions and political regimes.

Country risk, as measured by the EMBI+ index, was estimated as a function of i) the fiscal fundamentals captured by the ratio of public debt to GDP (PD/GDP); ii) the general fundamentals of the economy: the GDP growth over the last 12 months (GROWTH), inflation in the last 12 months (INF) and the annual nominal interest rates (IR) as well as the ratio of international reserves to GDP (RES/GDP); iii) the liquidity and solvency conditions as captured by the ratio between exports and public debt (X/GDP); iv) the debt intolerance to defaulters which is obtained by multiplying public debt to GDP by the index of the inverse of time since the last default[3] (DI). We also controlled for the debt profile including the average duration of the bonds (MAT). The reference currency is the US dollar and inflation rates were represented by the consumer price index (CPI). All variables were obtained from the International Financial Statistics (IFS) and Government Financial Statistics (GFS) of the International Monetary Fund or from the Moody´s data base.[4]

[2] We use the inverse of time since the last default to not exclude from the analysis those countries that never defaulted.

[3]

[4] Some data were available only on annual basis. We used industrial production to transform GDP to monthly basis, and public accounts, obtained from IFS and GFS publications, to transform public debt to monthly basis.

It is our expectation that country risk should increase with the ratio of public debt to GDP; decrease with GDP growth and increase with interest rates since both variables indicate the long term path conditions of public debt; increase with inflation and decrease with the ratio of international reserves to GDP. We also expect spreads to increase with the ratio of exports to public debt and with the inverse of the amount of time since the last default by PD/GDP and decline with duration. This variable is in itself a measure of country risk: the riskier the country the shorter the duration of its bonds and, if a country wants to issue a bond with a longer duration it will probably have to pay a higher premium.

We estimated two alternative specifications. The first one

$$EMBI_i = \alpha_i + \beta_i PD_i / GDP_i + \delta_i MAT_i + \gamma_i (DI * PD_i / GDP_i) + \varphi_i X_i / PD_i \qquad (1)$$

The equations were estimated for the entire sample of countries as well as for each country separately, using GLS and IV methods (to control for the endogeneity of duration and interest rates). For the panel of countries we estimated a pooling effect model, along with fixed effect and random effect ones.

Table1
Effects of Debt Fundamentals on Country Risk

Variable	GLS			IV		
	Pooling	FE	RE	Pooling	FE	RE
C	376.13	-18.60	-1007.28	376.91	34.29	-973.36
	(38.73)	(71.37)	(236.67)	(39.47)	(77.49)	(236.38)
PD/GDP	30.20	119.93	265.40	30.42	116.76	267.05
	(2.85)	(8.20)	(18.81)	(2.91)	(8.45)	(18.90)
MAT	-25.37	-36.32	-71.16	-26.18	-43.21	-82.59
	(2.85)	(4.47)	(29.88)	(2.94)	(5.53)	(30.39)
(PD/GDP)*DI	240.60	157.61	127.89	240.39	157.68	126.41
	(14.63)	(13.13)	(16.57)	(14.60)	(13.26)	(16.71)
X/PD	-1154.46	-65.71	3811.93	-1157.41	-45.28	4045.45
	(117.16)	(358.94)	(538.06)	(116.97)	(361.09)	(550.63)
R^2	0.38	0.63	0.64	0.38	0.63	0.64
Adj. R^2	0.37	0.63	0.63	0.37	0.62	0.63

Note: Standard Deviations in parentheses

As we can see in all models the estimated coefficients exhibited the expected sign, except for the ratio of exports to public debt in the random effect model, but with low significance. The second specification estimated was as follows:

$$EMBI_i = \alpha_i + \beta_i PD_i / GDP_i + \delta_i MAT_i + \gamma_i (DI * PD_i / GDP_i) + \varphi_i X_i / PD_i + \theta Z \qquad (2)$$

where Z is a vector of variables that captures the economy's general fundamentals, as explained earlier on.

In order to produce the estimates for the second specification we used an IV method with fixed effects. The impact of the general fundamentals on country risk was investigated by introducing the variables one by one. The results for debt fundamentals are the same as in the first specification.At same time, while interest rate and economic growth have a significant effect on country risk, the reserves to GDP ratio presents a strong multicollinearity with the exports to GDP ratio causing an over-specification problem. Inflation is not significant. Therefore, we can assume that a model which incorporates interest rates and economic growth is the most parsimonious one, and this was the one elected to be used in the decomposition for the pool of countries that will be our bench mark.

Table 2
The Effects of General Fundamentals on Country Risk

Variable	Models					
	1	2	3	4	5	6
C	376.91	255.62	289.34	258.16	1457.80	1513.87
	(39.47)	(40.55)	(55.22)	(31.81)	(232.09)	(197.86)
PD/GDP	30.42	33.46	29.45	63.20	28.11	33.54
	(2.91)	(3.22)	(3.06)	(3.44)	(3.18)	(3.60)
MAT	-26.18	-32.73	-26.26	-17.90	-33.61	-40.72
	(2.94)	(4.33)	(2.95)	(2.57)	(2.87)	(4.11)
(PD/GDP)*DI	240.39	235.09	237.50	228.12	238.40	233.43
	(14.60)	(13.47)	(15.45)	(13.87)	(14.44)	(13.38)
X/PD	-1157.41	-507.22	-1117.88	-119.29	-1106.78	-316.66
	(116.97)	(124.19)	(118.85)	(116.65)	(152.14)	(145.46)
IR		11.84				12.43
		(1.20)				(1.23)
INF			86.02			
			(51.94)			
RES/GDP				-54.85		
				(2.34)		
GROWTH					-1006.75	-1202.80
					(244.59)	(213.03)
R^2	0.38	0.40	0.37	0.62	0.39	0.38
Adj. R^2	0.37	0.40	0.37	0.62	0.39	0.38

Note: Standard Deviations in parentheses

The first specification and the most parsimonious version of the second specification were estimated for each country separately. To verify the impact of the difference in coefficients (or discrimination, if you prefer) we used the Oaxaca-Blinder decomposition. The results can be seen in Table 3.

Table 3
Discrimination in Absolute Terms

	Actual EMBI (A)	Predicted EMBI 1 (B)	Predicted EMBI 2 (C)	(B - A)	(C - A)
Argentina	3241	2317	2342	-924	-899
Venezuela	915	251	377	-664	-538
Ukraine	540	378	330	-162	-210
Peru	541	386	372	-155	-169
Mexico	355	200	234	-155	-121
Korea	184	31	35	-153	-149
Brazil	907	764	808	-143	-99
Colombia	582	442	447	-140	-135
Russia	1264	1250	1199	-14	-65
Bulgaria	503	622	614	119	110
South Africa	175	310	301	135	126
Poland	182	403	379	221	197
Ecuador	1694	1917	1868	223	174
Panama	418	751	681	333	263
Philippines	493	830	778	337	284
Turkey	622	972	1130	349	508
Morocco	431	792	764	361	333
Malaysia	111	512	524	401	412
Egypt	233	999	943	767	710

The second column of Table 3 shows the average actual Embi for each county. The third and fourth columns are the predicted Embis using the coefficients from the panel data estimations in the two specifications with the variables of each country,

respectively; putting it another way, the Embi that would prevail if countries' fundamentals were evaluated by the market. using the same parameters The two specifications produce very similar results. The last two columns are the differences between the predicted Embi and the actual values.

As we can observe in Table 3, in absolute terms, Argentina was the country that was most discriminated against in the sample: the average Embi for Argentina was around 900 base points higher than we would expect considering its fundamentals. At the other extreme was Egypt which received what could be referred to as "VIP" treatment. If the fundamentals alone were taken into account Egypt's average Embi would be more than 700 base points higher than it actually is.

Table 4
Ranking

	Actual Rank (A)	Rank EMBI 1 (B)	Rank EMBI 2 (C)	(B - A)	(C - A)
Argentina	1	1	1	0	0
Ecuador	2	2	2	0	0
Russia	3	3	3	0	0
Venezuela	4	17	14	13	10
Brazil	5	8	6	3	1
Turkey	6	5	4	-1	-2
Colombia	7	12	12	5	5
Peru	8	14	15	6	7
Ukraine	9	15	16	6	7
Bulgaria	10	10	10	0	0
Philippines	11	6	7	-5	-4
Morocco	12	7	8	-5	-4
Panama	13	9	9	-4	-4
Mexico	14	18	18	4	4
Egypt	15	4	5	-11	-10
Korea	16	19	19	3	3
Poland	17	13	13	-4	-4
South Africa	18	16	17	-2	-1
Malaysia	19	11	11	-8	-8

Table 4 shows the differences in the country-risk(s) as a consequence of discrimination. The first column is the actual ranking risk. The second and the third columns are the predicted rankings as indicated by the fundamentals. The last two columns are the differences between the actual figures and the predicted ones. If this value is positive, then there is sufficient discrimination against the country to change its place in the ranking. The first three positions are not affected: although Argentina is the most discriminated against in absolute terms, eliminating the discrimination doesn't change the fact that it was the highest risk country in the sample; the same holds true for Ecuador and Russia. Venezuela is the country that exhibits the largest change in its position. Based on its fundamentals Venezuela should be in one of the last positions instead of which it is in fourth position, together with Argentina, Russia and Ecuador. This result may be explained by a political risk that is not captured by the model. On the other hand, Egypt is the most favored country using this criterion. Korea, which is in 16th position should be the least risky country.

Table 5
Relative Discrimination

Country	Rel 1	Rel 2
Korea	-0.83	-0.81
Venezuela	-0.73	-0.59
Mexico	-0.44	-0.34
Ukraine	-0.30	-0.39
Peru	-0.29	-0.31
Argentina	-0.29	-0.28
Colombia	-0.24	-0.23
Brazil	-0.16	-0.11
Russia	-0.01	-0.05
Ecuador	0.13	0.10
Bulgaria	0.24	0.22
Turkey	0.56	0.82
Philippines	0.68	0.58
South Africa	0.77	0.72
Panama	0.80	0.63
Morocco	0.84	0.77
Poland	1.21	1.08
Egypt	3.30	3.05
Malaysia	3.59	3.70

Table 5 shows the relative discrimination for the two specifications. Some changes can be noted with regard to the previous case of absolute discrimination. Now, Korea is the country that is most discriminated against. Its Embi should be roughly 82% lower than it actually is, while Egypt and Malaysia remain the most favored countries in our sample.

4. Conclusions

An analysis of country risk for a pool of emerging markets shows that its determinants reflect both: fundamentals as well as sentiment. If the only factors that were taken into consideration were economic fundamentals and past behavior in relation to debt repayment then a number of countries would exhibit a very different level of risk than they actually do. The only country in the sample that receives a fair evaluation, on this basis, is Russia. In absolute terms, Argentina remains the most discriminated against country in the sample, but even after correcting for this it continues to be the riskiest country. Venezuela is the negatively affected or impacted economy that suffers the biggest drop in terms of position: after correcting for discrimination it would go from being the 4th riskiest country to the 17th riskiest, in front of just Malaysia and Korea. In relative terms is Korea the most discriminated against country: it should be the least risky economy in the sample instead of being the 16th riskiest.

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