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ARE WORKERS' REMITTANCES RELEVANT FOR CREDIT RATING AGENCIES?

by

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PREFACE

This research deals with two key issues for many emerging countries: sovereign ratings provided by OECD-based firms and remittance flows. Previous upsurge episodes in remittance flows have underlined the interactions between sovereign ratings and remittances. Today, in a context of shrinking world GDP growth, remittances are also affecting ratings in emerging economies. In May 2009, Standard & Poor's lowered El Salvador's credit rating, underlining the country's poor performance in consumption, investment and exports, as well as the significant drop in remittances. In the same line, Moody's Investor Service explained that the Philippines's economic slowdown was due to the decline in remittances, which account for more than 10 per cent of domestic output and are a major driver of consumption. This work assesses the influence of workers' remittances for rating agencies, with special focus on Latin America. Besides, it proposes a methodology for assigning ratings to unrated and remittance-dependent countries.

This research has several policy implications. First, remittance flows may have an influence on low and middle income countries in Central America and the Caribbean, therefore affecting their access to capital markets. Second, their impact depends more on the reduction of the volatility of external flows than on the improvement of the solvency ratio (debt over exports and remittances). Third, other risk indicators such as the reduction of debt service or the lowering of the foreign currency debt are more relevant to explain ratings in the region. Finally, this paper provides sovereign ratings for a group of countries not covered by rating agencies (*i.e.* shadow ratings). With this aim, some public-private ventures have been set up in the past. However, other types of partnerships can also be envisaged at the inter-governmental level, involving public officials with an interest in these regions. For instance, public donors from both OECD and non-OECD countries, may be interested to deploy an initiative for sovereign rating's coverage, as a way to enhance countries' financial visibility and encourage cooperation.

This study is a background paper for the upcoming *Latin American Economic Outlook 2010*, focused on migration and development in Latin America, providing technical support for the chapter on *Remittances and the Capital Markets in Latin America*.

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Septembre 2009

RÉSUMÉ

Les fonds que les travailleurs immigrés envoient dans leur pays d'origine constituent une source de financement majeure pour les pays en développement. En plus de leur impact microéconomique sur les ménages, ces transferts financiers sont devenus un facteur important de stabilité macroéconomique, contribuant à réduire la volatilité des flux de capitaux et le risque de dégradation de la balance des comptes courants, renforçant ainsi la solvabilité. A partir d'une étude portant sur 83 pays en développement et couvrant la période 1993-2006, nous analysons l'impact de ces transferts financiers sur la notation souveraine. D'abord, nous considérons les déterminants traditionnels des ratings souverains et déterminons dans quelle mesure ces envois de fonds sont pris en compte. Ensuite, nous construisons un modèle pour les pays qui sont les premiers récipiendaires de ces transferts afin de mesurer leur effet potentiel sur les notes des trois grandes agences, Fitch, Moody's et S&P. Finalement, nous attribuons des ratings aux pays latino-américains non notés pour lesquels ces transferts financiers sont élevés. Nous concluons que les agences de notation tiennent compte de ces transferts dans leur appréciation du risque souverain pour un petit nombre de pays; les États en question étant généralement de petite taille et ayant un niveau de revenus faible ou intermédiaire. Ces résultats nous permettent enfin de tirer toute une série de recommandations d'ordre politique pour améliorer la couverture des ratings.

Mots clés: envois de fonds des travailleurs, notations souveraines, marchés de capitaux émergents, risque souverain.

Classification JEL: F3, F24, G24, O11.

ABSTRACT

Remittance flows are an important source of financing for developing countries. In addition to the microeconomic impact at the household level, remittances have grown into an important pillar of macroeconomic stability, reducing volatility of external flows, lessening the probability of current account reversals, thus strengthening creditworthiness. By studying 83 developing countries covering the period 1993-2006, we analyse the impact of workers' remittances on sovereign rating assessment. First, we look at the traditional determinants of sovereign ratings and assess to what extent remittances are taken into account. Second, we build a model for high-remittance receptors to capture the potential effect that remittances may have on Fitch, Moody's and S&P ratings. Third, we assign ratings to unrated Latin American countries for which remittance flows are generally high. Our conclusion supports the view that credit rating agencies (CRAs) do take remittance flows into account to rate sovereigns. Nevertheless, this variable turns out to be significant for a limited set of countries, small in size and classified in the low and middle income categories. We derive policy implications and recommendations from our findings for boosting rating coverage.

Keywords: remittances, sovereign ratings, emerging and developing capital markets, sovereign risk.

JEL Classification: F3, F24, G24, O11.

I. INTRODUCTION

Research on the access of sovereigns to international capital markets suggests that sovereign creditworthiness could be improved by including remittance flows in key indebtedness indicators, such as debt-to-exports and debt service to current account ratios. These have been identified in the literature as common determinants of sovereign ratings (Ratha, 2005; World Bank, 2006).

Two series of surveys at the crossroads of the literature on sovereign ratings and remittance flows are worth mentioning. First, Ratha *et al.* (2007) define a standard ratings model and find that a number of unrated countries would be likely to have higher ratings than expected, notably on account of foreign currency inflows such as remittances. According to Ratha (2005), "country credit ratings by major international rating agencies often fail to account for remittances". Second, rating agencies note in their country studies that remittances matter to determine ratings for countries in which this flow is considerable. At a time when economic growth was still high, Fitch – Fitch Ratings - (2008b) underlined that remittance flows could positively impact ratings (e.g. El Salvador). Fitch comments are consistent with its sovereign methodology that "takes into account the volatility and potential vulnerability of receipts, such as remittances, to domestic and external shocks" (Fitch 2007). In its outlook for Mexico, S&P - Standard and Poor's - (2005) stressed remittances' importance as an income source for the balance of payments, and their impact on other determinants of sovereign ratings, such as public finances. More recently, in May 2009, S&P lowered El Salvador's credit rating to "BB" from "BB+", stating that "the weak performance in 2009 is due to falling consumption, investments, and exports as a result of a significant pass-through from the global recession" and that "remittances from the United States fell by 8 per cent in the first two months of the year".¹ In the same way, in February 2009, Moody's – Moody's Investors Service - highlighted that, for a country like the Philippines, a slower economic growth for 2009 would also be explained by a decline in remittances, which account for more than 10 per cent of domestic output and are a major driver of consumption.²

Despite these stylised facts, little research has been devoted to analyse the impact that remittances have on sovereign ratings assigned by CRAs. Our paper attempts to address this issue by building a rating model over a long time span (1993-2006), and estimating the ratings of the three main CRAs for a sample of 83 emerging countries. This study aims at answering four key questions: how can we capture the effect of remittances on ratings? Do rating agencies really take remittances fully into account in their analyses? What is the potential effect of remittances

1 "S&P lowers El Salvador rating to 'BB' from 'BB+'", *Reuters*, May 12, 2009 (online article).

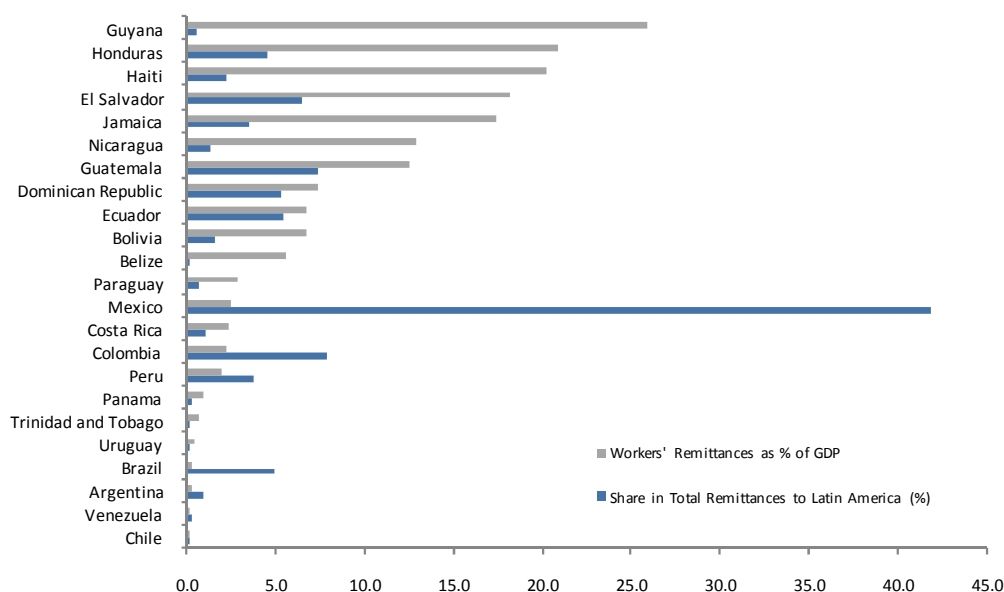
2 "Moody's: Slowing remittances hurt RP", *Manila Bulletin*, February 14, 2009 (online article).

when included in market variable estimations? And finally, what is the “shadow rating” for unrated countries highly dependent on remittances?

With this purpose, it is crucial to understand why CRAs should take remittances into consideration when assigning ratings. Although the effects of workers’ remittances at the macro and the micro level have been largely studied (see World Bank, 2006 for a review of the literature), the evidence of the implications for capital markets actors and market sentiment is still scarce.

This issue is crucial given the importance of remittance flows towards the developing world. The central empirical analysis of this paper makes a focus on Latin America, where remittances reach high levels both in absolute values (e.g., Mexico, Brazil, Colombia, Guatemala, El Salvador, Dominican Republic, Ecuador) and with respect to the size of the economies (e.g., Guyana, Honduras, Haiti, Jamaica, El Salvador). Nevertheless, differences among countries in the region remain important. Figure 1 shows that remittances are prominent for Central American and Caribbean countries.

Figure 1. Remittances in Latin America – 2007

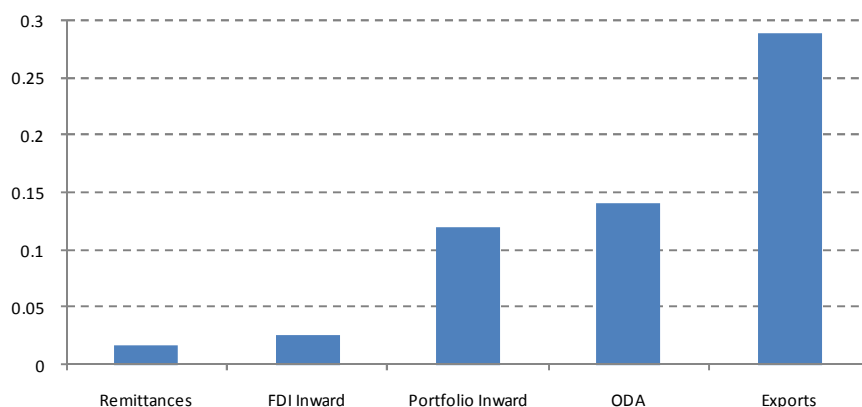


Source: Authors calculation, based on Global Development Finance, 2009.

In order to capture the effects of remittances, we have to focus on the country’s Balance of Payments, which is part of any government’s financial strength (see Moody’s 2008b for the importance of balance of payment considerations in determining ratings). First, we analyse a common channel to measure the importance of remittances in sovereign risk assessment (Ratha 2005, World Bank 2006). We wonder to what extent remittances can contribute to improve sovereign ratings when they are included in a traditional solvency ratio (i.e. the debt to exports of goods and services ratio). Second, we introduce the volatility of external flows (FDI flows, Portfolio flows, ODA, Bank loans, Exports and Remittances) as additional variable explaining sovereign ratings. These flows are particularly important for Latin America, where saving rates

are low and dependence on external financing is high. Our results show that remittances can reduce volatility of external flows owing to their stability (when compared to other flows) and their low correlation with other external flows. Figure 2 exhibits the volatility of major external flows to Latin American countries over the period 1992-2007.³

Figure 2. Volatility of External Flows Over GDP in Latin America (1992-2007)



Notes:

a) Volatility is calculated as the average of the variance of each flow over GDP. Similar results are obtained by calculating the Volatility of external flows from the de-trended flows as a ratio of GDP, using the Hodrick-Prescott filter to remove trends.

b) The Latin American and Caribbean countries included are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela.

Source: Authors based on World Bank and OECD data.

Migrants' remittances are considered a stable source of financing compared with other financial flows (Ratha 2004).⁴ Remittances, in the same way as foreign investment or exports, are important items in the balance of payments, contributing to mitigate credit risk at the country level. More precisely, remittances strengthen financial stability by reducing the probability of current account reversals (Bugamelli and Paterno, 2005). This, in turn, can be related to the probability of default studied in country risk models. In the same way, remittances can have a countercyclical effect in most countries of the region, thus significantly reducing growth volatility (Fajnzylber and Lopez 2007).⁵ Of course, as pointed by the report *Close to Home*, the

3 Figures 3a and 3b (section III) disclose volatility of inward external flows with and without workers' remittances for Latin American countries.

4 See Esteves and Khoudour-Castéras (2009) for similar findings regarding the late 19th century.

5 However, as pointed out elsewhere, migrant-based income can become costly to emerging countries when resources are mismanaged. Remittances may reduce the government's incentive to maintain fiscal policy discipline (Chami *et al.*, 2008). Moreover, this dependence raises a moral hazard problem

comprehensive World Bank study on Latin America, remittances are an engine for development, but they are neither “manna from heaven” nor a substitute for sound development policies.

The remainder of this article is organised as follows. In section II, we provide a review of the literature on sovereign ratings and in particular on the relevance of sovereign ratings for emerging economies as well as the determinants of these ratings. Section III presents the most important stylised facts and analyses the results of the econometric model. In particular, this section emphasizes the impact of remittance flows on ratings. We also provide an empirical analysis for countries with a high share of remittances (as a percentage of GDP). Finally, section IV provides concluding remarks and sketches the major policy implications that follow from this research.

by reducing the political will to implement reforms and pushing real exchange appreciation. These findings are consistent with Amuedo-Dorantes and Pozo (2004) who relate higher remittance flows to the reduction of the receiving country’s competitiveness.

II. REVIEW OF THE LITERATURE

Two dimensions are related to the analysis of rating agencies. The first considers the impact of ratings on capital markets. The second, where a vast and relevant literature exists, studies the determinants of ratings.

Focusing on the impact on capital markets, Kaminsky and Schmukler (2001) find that downgrades and upgrades have an impact on country risk and stock returns: these rating changes are transmitted across countries, with neighbour-country effects being more significant. They conclude that rating agencies may contribute to heighten financial instability. The study of sovereign risk assessment has mainly focused on comparing ratings to market spreads. For the period 1987-1994, Cantor and Packer (1996) find a greater impact on spreads from a rating change in the case of Moody's or if it is related to speculative-grade countries. Reisen and Von Maltzan (1999) show that, during the period 1989-1997, Fitch, Moody's and S&P downgrades have a significant impact on spreads, contrary to upgrades, which were anticipated by the market. For them, sovereign ratings have the potential to moderate euphoria among investors on emerging markets but rating agencies failed to exploit that potential in the 1990s. Sy (2001) highlights the strong negative relationship between ratings and EMBI+ spreads declines during periods of high risk aversion (e.g., 1997-1998). Mora (2006) examines Moody's and S&P ratings and concludes that the procyclicality of ratings is not ascertained when considering the post Asian crisis years. Analysing sovereign ratings issued by the three agencies for 1993-2007, Gaillard (2009) finds that the procyclicality of ratings was much sharper during periods of high risk aversion (1997-1998 in particular) than periods of low risk aversion (2005-2007). He also highlights the greater stability of Moody's ratings. In a different way, Cavallo, Powell and Rigobon (2008) develop a simple Hausman specification test and find that there is some informational content in sovereign ratings that is not completely captured by market spreads. Additional tests reinforce their conclusion that ratings matter. Lastly, going beyond the traditional "ratings vs. spreads" view, Roubini and Manasse (2005) present an original sovereign risk assessment methodology by using a binary recursive tree. With this approach, they discuss appropriate policy options to prevent crises. A key result that follows from this research is that ratings do matter and they are an important piece to understand the behaviour of capital markets.

The literature focusing on sovereign ratings methodology has expanded since the mid 1990s. Cantor and Packer (1996) identify five variables that may explain S&P and Moody's sovereign ratings: per capita income, inflation, external debt ratio, the indicator for economic development and the default history. Jüttner and McCarthy (2000) show that Cantor and Packer's model becomes less accurate after the Asian crisis. They suggest that the determinants of 1998 ratings are the current account balance, the indicators for economic development and

default history, the interest rate differential vis-à-vis the USD, and the range of problematic assets. Nevertheless, several follow-up studies corroborate Cantor and Packer's results. For Afonso (2003), the most significant variables for 2002 ratings (per capita income, inflation, indicators for economic development and default history) are already determinants for Cantor and Packer. Moody's own study (Moody's, 2004) produces a similar finding: two of their four explanatory variables (per capita GDP and external debt) are the same as Cantor and Packer's. Moody's main finding is the incorporation of a political variable that significantly improves the model. For Rowland (2005), the level of international reserves as a share of GDP, and the openness of the economy are additional relevant determinants. Sutton's (2005) findings are consistent with previous papers. He also considers the maturity structure of international banking claims against both private and public sector entities in the country as a significant variable.

III. EMPIRICAL MODEL

III.1. Data Description

As noted in the previous section, the literature on sovereign ratings is extensive. We have tried to focus on the most representative work to identify the variables considered by agencies when assigning a rating to public borrowers. The traditional approach in the literature has consisted in regressing the dependent variable (*i.e.* sovereign rating) on a series of macroeconomic and institutional indicators.

Table 1 summarizes the period and variables used by Cantor and Packer (1996), Rowland and Torres (2004), Sutton (2005) and Mora (2006) to analyse the determinants of sovereign ratings. All these articles study as a determinant of sovereign ratings the solvency ratio (*i.e.* external debt over exports), a key variable in our analysis. Whereas Cantor and Packer's and Sutton's analyses are based on a cross-country study, Rowland and Torres and Mora use panel data to estimate rating determinants. Most of these studies use one or more of the available ratings published by the three main rating agencies, Standard and Poor's, Moody's and Fitch. Table 1 also contains our preferred model that summarizes our analysis of previous rating models.

Table 1. Summary of Models and Variables

	Dependent Variable		Independent Variables																							
	Year	Period	Sovereign Rating	Institutional rating	GDP per capita	GDP growth	Inflation	Fiscal balance	Fiscal Balance/GDP	External balance	External Debt/GDP	External Debt / Exports	Debt Service/GDP	Reserves	Reserves/GDP	Current Account Balance	Current Account Balance/GDP	Ratios short-term bank/Total claims	Volatility External Flows	EMBI Dynamic	Default variable (diff. for each model)	Indicator OECD	Corruption Index	Dummy European Union	Spread (lag)	
Cantor and Packer	1996	1995	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Rowland and Torres	2004	1987-2001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Sutton	2005	2004	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mora	2006	1986-2001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Our model	2009	1993-2006	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Source: Authors based on Cantor and Packer (1996), Rowland and Torres (2004), Sutton (2005) and Mora (2006).

The results presented in Table 1 are straightforward. Sovereign ratings are associated to a country's fundamentals and, in contrast with sovereign spreads (e.g., Eichengreen and Mody, 2000), only domestic factors are analysed. More precisely, macroeconomic conditions (e.g., inflation rate, GDP growth), solvency ratios (e.g., external debt over exports, external debt service over GDP) and structural aspects (e.g. GDP per capita, economic development) are employed as determinants of sovereign ratings.⁶

In this paper we use data on annual ratings from the three main rating agencies: Standard and Poor's, Moody's and Fitch. The covered period is 1993-2006, the frequency is annual and the initial sample includes 83 rated countries (excluding High Income countries according to World Bank's definition). Ratings are transformed linearly (Table 2).

Table 2. Linear Transformation of Ratings

S&P	Moody's	Fitch	Linear transformation
AAA	Aaa	AAA	21
AA+	Aa1	AA+	20
AA	Aa2	AA	19
AA-	Aa3	AA-	18
A+	A1	A+	17
A	A2	A	16
A-	A3	A-	15
BBB+	Baa1	BBB+	14
BBB	Baa2	BBB	13
BBB-	Baa3	BBB-	12
BB+	Ba1	BB+	11
BB	Ba2	BB	10
BB-	Ba3	BB-	9
B+	B1	B+	8
B	B2	B	7
B-	B3	B-	6
CCC+	Caa1	CCC+	5
CCC	Caa2	CCC	4
CCC-	Caa3	CCC-	3
CC & C	Ca	CC & C	2
SD & D	C	DDD, DD & D	1

Source: Authors, based on previous linear transformations (see Cantor and Packer 1996 and Gaillard 2009). Ferri et al. (1999) used both a linear and a nonlinear transformation of ratings. Their nonlinear transformation was based on secondary market interest rate spreads. Such a transformation is impossible for our sample, due to the lack of data for several countries.

⁶ Interestingly, the exchange rate is not directly studied in the standard models of sovereign ratings. However, balance of payments' variables (which affect the exchange rate) are studied as determinants of sovereign ratings.

Macroeconomic data come from the World Development Indicators and the International Financial Statistics. The source of national debt data is the Global Development Finance (World Bank). Table 3 provides a résumé of the main macroeconomic variables used across the different rating models. In particular, exports data come from the Global Development Finance (GDF) and workers' remittances figures come from the International Financial Statistics (IFS).⁷

7 Data on exports from the Global Development Finance also include total workers' remittances registered in the Balance of Payments. The GDF defines *Exports of Goods, Services and Income (XGS)* as the total value of goods and services exported, and receipts of compensation of employees, and investment income. In order to calculate our solvency ratio we first exclude workers' remittances and compensation of employees from the XGS variable (solvency ratio without remittances) and then we include workers' remittances (from the IFS) in the denominator of the solvency ratio (solvency ratio with remittances). Workers' remittances, a transfer and not an income entry in the balance of payments, are treated as compensation of employees in Global Development Finance because they are often uneasy to distinguish from compensation of non-resident workers and migrants. We therefore have usually workers' remittances and compensation of employees contained in the Export series. Workers' remittances and compensation of employees comprise current transfers by migrant workers, wages and salaries earned by non-resident workers. In addition, migrants' transfers, a part of capital transfers, are treated as workers' remittances in Global Development Finance. We therefore restrict our analysis to the series of "workers remittances", and exclude compensation of employees and migrants' transfers (as estimated by GDF database).

Table 3. Descriptive Statistics for Variables (1993-2006)

Variables	Obs	Mean	Std. Dev.
GDP (current US\$)	1661	7.13E+10	2.01E+11
GDP (constant 2000 US\$)	1655	6.62E+10	1.73E+11
GDP growth (annual %)	1649	3.777404	6.394133
GDP per capita (constant 2000 US\$)	1655	1904.606	1673.767
GDP per capita, PPP (current international \$)	1636	4154.623	3159.793
Inflation, consumer prices (annual %)	1475	52.26535	337.7307
Inflation, GDP deflator (annual %)	1642	86.95552	642.4122
Consumer price index (2000 = 100)	1497	87.18809	54.11652
Real effective exchange rate index (2000 = 100)	772	4489.065	121757.5
Official exchange rate (LCU per US\$, period average)	1590	503.812	1759.692
Changes in net reserves (BoP, current US\$)	1441	-1.85E+09	1.26E+10
Current account balance (% of GDP)	1437	-3.532393	-7.884468
Current account balance (BoP, current US\$)	1441	2.39E+08	1.05E+10
Exports of goods and services (BoP, current US\$)	1441	1.95E+10	5.54E+10
Exports of goods, services and income (BoP, current US\$)	1441	2.05E+10	5.80E+10
Foreign direct investment, net (BoP, current US\$)	1419	1.50E+09	5.16E+09
Foreign direct investment, net inflows (% of GDP)	1463	3.352745	10.4849
Imports of goods and services (BoP, current US\$)	1441	1.89E+10	4.85E+10
Imports of goods, services and income (BoP, current US\$)	1441	2.14E+10	5.26E+10
Total reserves (% of external debt)	1408	46.78096	125.9236
Total reserves (includes gold, current US\$)	1545	1.13E+10	6.08E+10
Total reserves in months of imports	1412	3.935548	3.113531
Total reserves minus gold (current US\$)	1545	1.07E+10	6.00E+10
Workers' remittances, receipts (BoP, current US\$)	1076	1.03E+09	2.37E+09
Net capital account (BoP, current US\$)	1073	8.98E+07	9.64E+08
Bank capital to assets ratio (%)	391	10.40614	3.903248
Bank nonperforming loans to total gross loans (%)	422	10.42891	8.365045
Risk premium on lending (%)	562	8.088065	14.34093
S&P/EMDB indexes (annual % change)	425	18.53672	47.35008
Export quantum/quantity index (2000 = 100)	1179	94.06167	51.80754
Import value index (2000 = 100)	1284	95.04032	48.91408
Gross National Product	1483	6.84E+10	1.81E+11
Ratings Fitchs	485	9.735547	3.015993
Ratings Moodys	603	9.972587	3.324188
Ratings Standard and Poors	614	9.74107	2.983933
Fiscal Budget	858	-2.447704	4.318253
Workers Remittances	1076	1.03E+09	2.37E+09
Workers Remittances / GDP	1072	0.0369062	0.0476944
Volatility of GDP Growth	1378	3.486176	4.01902
Volatility of External flows (incl. remittances)	1150	0.0049457	0.0309158
Volatility of External flows (excl. remittances)	1150	0.0050462	0.030922
Solvency Ratio (Debt / Exports)	1261	240.9641	321.0831
Solvency Ratio (Debt / Exports) excl. remittances	1340	247.5379	319.7211

Sources: Global Development Finance, World Development Indicators, International Financial Statistics, 2009; Fitch (2009), Moody's (2009), S&P (2009).

III.2. Testing Previous Models for Sovereign Ratings: The Effect of Remittances

We first test the four representative models proposed in the literature. This research has used the solvency ratio (*i.e.* total external debt-to-exports ratio) as a significant and key variable

to explain sovereign ratings. We intend to identify the most relevant determinants of ratings. In contrast to previous studies, our sample includes a large number of countries and covers a 14-year period. We run OLS and fixed-effect panel data regressions, using the sovereign rating of the three rating agencies as the dependent variable.⁸

Moreover, we are interested in analysing the impact of remittances on rating agencies. As presented, remittance flows can be shock absorbers for the economy and play a role in reducing the country's vulnerability. More generally, remittances can improve creditworthiness and thereby facilitate access to international capital markets.

We introduce remittances in the solvency ratio's denominator to capture the entire effect of the current account incomes, as our second core variable (*i.e.* volatility of external flows) is not studied in the literature. These revenues in the balance of payments may serve as a cushion against external shocks and then reduce the risk of default on external debt. In fact, since we are interested in the country's capacity to pay the entire total external debt (private and public), it is relevant to include remittances in this ratio, to capture total incomes received by nationals in the balance of payments.

Annex 1 exhibits the evolution of our solvency ratio for Latin American and Caribbean countries, where the relative impact of remittances in debt indicators remains heterogeneous. In general, the effect of remittances is higher in Central American and Caribbean countries (e.g., Dominican Republic, El Salvador, Guatemala, and Jamaica) than in other countries of the region (e.g. Argentina, Brazil, Chile, Peru, and Venezuela).

Following the literature review, we opt for testing our hypothesis on a group of models on sovereign ratings. Annex 2 summarises results of four representative models (Cantor and Packer, 1996; Rowland and Torres, 2004; Sutton, 2005; Mora, 2006), for the three agencies over the period 1993-2006. To quantify the impact of remittances on sovereign ratings, we test these standard models for ratings by excluding/including the flow of remittances in the external debt to exports ratio. More precisely, we use both ratios, total debt over exports of goods and services, and workers' remittances (*TDX*) and total debt over exports of goods and services (*TDX_wr*).

Results in Annex 2 show that, for most models, the ratio debt over exports (with or without remittances) is negative and significant for the three agencies.⁹ Indeed, it is a key and relevant variable explaining sovereign ratings. For instance, taking Cantor and Packer (1996) model, columns 1 to 6 in Annex 2a show that the foreign currency debt to exports ratio is statistically significant at 1 per cent and negatively correlated with sovereign ratings.

In addition to this ratio, other variables are crucial to explain ratings: GDP per capita, inflation rate, the historical default and the institutional stability (see Cantor and Packer, 1996; and Moody's, 2004). Finally, when comparing the impact of including and excluding remittances on the ratio debt over exports, the value of the coefficient is almost the same for both cases (in absolute terms), for all rating models studied.

These results suggest that the impact of workers' remittances on CRAs' sovereign methodologies is small. Indeed, an inclusion of remittances implies a reduction of the solvency

8 OLS estimations are not reported but can be provided upon request.

9 The exception is the estimation of Fitch ratings by Mora (2006).

ratio and consequently a higher coefficient (in absolute value) can then compensate for the “remittances effect” in the sovereign rating. This finding is explained empirically for our general model.

III.3. Proposing a General Model and Testing Effect from Remittances

Traditional models on the determinants of ratings include a solvency indicator, such as the debt to exports ratio. By introducing remittance flows (as suggested by Ratha, 2005), we have tested if they play a role in reducing external vulnerabilities. In addition, we introduce a consistent explanatory variable for sovereign ratings in which remittances can play a crucial role: the volatility of external flows.

As specified above, when compared to other external flows (*i.e.* exports, portfolio flows, FDI flows, ODA), remittances display a much lower volatility and lower correlation to these flows; they can act as a cushion vis-à-vis capital flights. We assess the volatility of external flows as a second channel through which remittance flows are likely to affect sovereign ratings. Our hypothesis is that remittances can reduce the total volatility of inward external flows, which is itself a powerful explanatory variable for sovereign ratings.

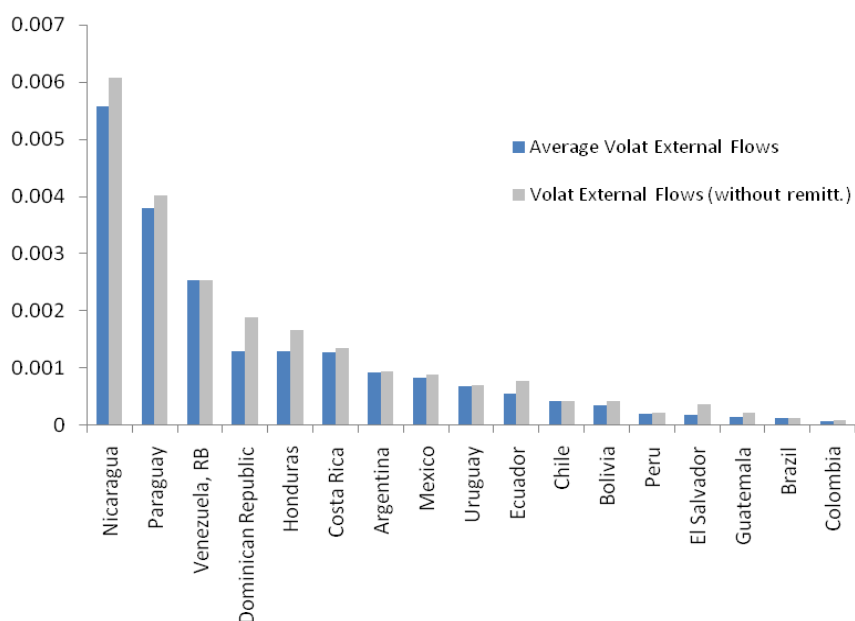
We use the variance as a measure of external flows volatility. We decompose the variance of inward external flows as follows:

$$Var(\text{external_flows})_{\alpha,t} = \sum_{i=1}^N w_{i,t}^2 \cdot Var(X_{i,t}) + 2 \sum_{i \neq j}^N w_{i,t} w_{j,t} Cov(X_{i,t}, X_{j,t})$$

where $Var(\text{external_flows})_{\alpha,t}$ corresponds to the variance of inward external flows of country α at time t , $w_{i,t}$ is the weight of the external flow i with respect to the total external flows in country α , $Var(X_{i,t})$ is the variance of the external flow i as a share of GDP between $t-4$ and t , $Cov(X_{i,t}, X_{j,t})$ is the covariance between the external flows over GDP i and j and from $t-4$ to t .

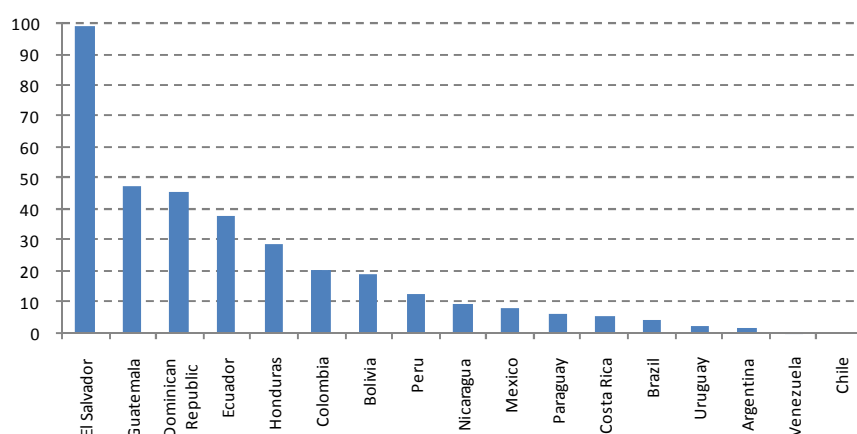
Figures 3a and 3b present the volatility of external flows by including and excluding remittances (see Annex 3 for the evolution of the volatility of external flows for Latin American countries during 1993-2007). There is a considerable reduction of external flows volatility for some South and Central American countries with high levels of remittances over GDP (*i.e.* El Salvador, Guatemala, Dominican Republic, Ecuador, Honduras and Colombia).

Figure 3a. Average Volatility of External Flows With and Without Workers' Remittances (Average 1993-2007)



Source: Authors' calculation, based on Global Development Finance and International Financial Statistics, 2009.

Figure 3b. Percent Change on Volatility Excluding Remittances (Average 1993-2007)



Source: Authors' calculation, based on Global Development Finance and International Financial Statistics, 2009.

Considering the results from the four standard models and our new volatility indicator presented above, we propose the following model for our analysis (we name it General Model):

$$Rating_{i,t} = \beta_0 + \beta_1 GDP_pc + \beta_2 GDP_growth_{i,t} + \beta_3 Inflat_{i,t} + \beta_4 Fisc_budg_{i,t} + \beta_5 CA_{i,t} + \beta_6 TDX_{i,t} + \beta_7 Default_{i,t} + \beta_8 Re_serves_{i,t} + \beta_9 Volat_indicator_{i,t} + \beta_{10} EMBI_{i,t} + \tau_t + \varepsilon_{i,t}$$

where $Rating_{i,t}$ corresponds to the transformed rating of country i at time t (see Table 2), GDP_pc is the GDP per capita in current international dollars, GDP_growth is the product's growth, $Inflat$ corresponds to annual inflation, $Fisc_budg$ is the annual balance budget as a share of GDP, CA is the current account position (as a share of GDP), TDX is the ratio of total debt to exports, $Default$ is a dummy variable for countries taking value 1 for countries having experienced a default during the previous 20 years, Re_serves is the ratio of reserves to GDP, $Volat_indicator$ is the external flows volatility, $EMBI$ is a dummy variable for those countries covered by the Bond Index calculated by JP Morgan, τ_t is a year fixed effect and $\varepsilon_{i,t}$ is an error term. Within this setup, β_6 and β_9 measure the elasticity of sovereign ratings with respect to the debt to exports ratio and the external flows volatility respectively, after controlling for all the other factors (GDP, inflation, volatility, etc.). The term τ_t is capturing differences in sovereign rating across time not explained by the other determinants.

In this model, we are mainly interested in the variables that can be affected by the flow of remittances, particularly the volatility indicator (*i.e.* the volatility of inward external flows) and the solvency ratio (*i.e.* the debt to exports ratio).¹⁰ Tables 4a and 4b show the results for our general model and the three rating agencies. We run OLS and fixed-effect panel data regressions, the sovereign rating of the three agencies being the dependent variable and the volatility indicator and the solvency ratio, including and excluding remittances, being two of the many independent variables used.¹¹

10 As for the case of the models presented above, we build an artificial ratio by subtracting the total amount of *Workers' Remittances* from the variable *Total Exports*, and we name it TDX_wr , this is, the debt to exports ratio excluding workers' remittances. Again, the coefficients for the variable *Total Debt/Exports* with and without remittances are very similar. By the same, in order to analyse the impact of remittances through the volatility of external flows, we subtract *Workers' Remittances* to the calculation of the volatility of external flows, and we name it $Volat_indicator_wr$, this is, the volatility of external flows by excluding workers' remittances. A coefficient test shows that they are not significantly different from the previous regression.

11 A complementary approach consisted in defining a variable taking the difference between the two solvency ratios and volatilities of external flows, this is:

$$\Delta_1 = \left[\frac{Debt}{Exports} \right] - \left[\frac{Debt}{Exports + remittances} \right] \text{ and } \Delta_2 = Volat_{with_remit} - Volat_{without_remit},$$

and test for the significance of these variables in the general model. For the first gap, when including them in the model together with the ratio debt over exports it was significant at 1%, but it becomes non-significant when excluding the ratio. The second gap is not significant in the model at the 5% level (except for Fitch).

Table 4a. General Model – OLS Estimation with time effect

	S&P		(ii)		Moody's		(iv)		Fitch		(vi)	
	(i) With remittances	ME	Without Remittances	ME	With remittances	ME	Without Remittances	ME	With remittances	ME	Without Remittances	ME
GDP per capital (PPP)	0.0004*** [0.0000]	1.64941	0.0004*** [0.0000]	1.64941	0.0005*** [0.0000]	2.06176	0.0004*** [0.0000]	1.64941	0.0004*** [0.0000]	1.64941	0.0004*** [0.0000]	1.64941
GDP growth (annual)	0.0294 [0.0313]	0.11148	0.0262 [0.0305]	0.09935	0.0506* [0.0281]	0.19187	0.0392 [0.0271]	0.14864	0.0346 [0.0327]	0.1312	0.0299 [0.0319]	0.11338
Annual inflation	-0.0022** [0.0010]	-0.107	-0.0022** [0.0010]	-0.107	-0.0007 [0.0007]	-0.03405	-0.0008 [0.0007]	-0.03891	-0.0023 [0.0014]	-0.11187	-0.0024* [0.0014]	-0.11673
Fiscal Budget	0.0468 [0.0341]	-0.11435	0.0277 [0.0331]	-0.06768	-0.0969*** [0.0353]	0.23676	-0.0825** [0.0336]	0.20157	-0.0086 [0.0430]	0.02101	-0.0155 [0.0413]	0.03787
Current Account (% GDP)	-0.1896*** [0.0227]	0.67197	-0.1851*** [0.0215]	0.65602	-0.1362*** [0.0213]	0.48271	-0.1545*** [0.0201]	0.54757	-0.1372*** [0.0226]	0.48626	-0.1490*** [0.0214]	0.52808
Solvency Ratio (debt/exports)	-0.0101*** [0.0013]	-2.22517	-0.0111*** [0.0013]	-2.44548	-0.0129*** [0.0014]	-2.84205	-0.0130*** [0.0012]	-2.86408	-0.0124*** [0.0017]	-2.73189	-0.0132*** [0.0015]	-2.90814
Default dummy (20 years)	-1.7469*** [0.2625]	-1.27626	-1.9368*** [0.2499]	-1.415	-2.6050*** [0.2691]	-1.90318	-2.4498*** [0.2501]	-1.78979	-1.8520*** [0.3246]	-1.35304	-1.8410*** [0.3058]	-1.34501
Reserves Ratio	0.0849*** [0.0110]	1.30669	0.0811*** [0.0106]	1.24821	0.0511*** [0.0108]	0.78648	0.0468*** [0.0102]	0.7203	0.0964*** [0.0198]	1.48369	0.0746*** [0.0166]	1.14816
Volatility External Flows	-266.4333*** [53.7073]	-1.29213	-193.2743*** [42.4545]	-0.93733	-11.8300* [7.0292]	-0.05737	-14.3001** [6.8833]	-0.06935	-188.9302*** [61.0493]	-0.91626	-157.2313*** [46.1474]	-0.76253
EMBI dummy	0.5312** [0.2341]	0.10882	0.6891*** [0.2303]	0.14117	0.2792 [0.2355]	0.0572	0.4602** [0.2241]	0.09428	0.2921 [0.2960]	0.05984	0.4524 [0.2870]	0.09268
Observations	374		398		361		390		284		305	
Number of country_id	0.575		0.597		0.599		0.632		0.535		0.547	
R-squared												

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Note: M.E. refers to the product between sample mean and the coefficient for each variable.

Source: Authors' calculation.

Table 4b. General Model – Fixed Effect Estimation with time effect

	S&P		(ii)		Moody's		(iv)		Fitch		(vi)	
	(i) With remittances	ME	Without Remittances	ME	With remittances	ME	Without Remittances	ME	With remittances	ME	Without Remittances	ME
GDP per capital (PPP)	0.0010*** [0.0001]	4.1235	0.0010*** [0.0001]	4.1235	0.0012*** [0.0001]	4.9482	0.0011*** [0.0001]	4.5359	0.0010*** [0.0001]	4.1235	0.0010*** [0.0001]	4.1235
GDP growth (annual)	-0.0249 [0.0219]	-0.0944	-0.03 [0.0202]	-0.1138	-0.0540*** [0.0177]	-0.2048	-0.0536*** [0.0170]	-0.2032	-0.0126 [0.0229]	-0.0478	-0.0119 [0.0215]	-0.0451
Annual inflation	-0.0013** [0.0006]	-0.0632	-0.0012** [0.0006]	-0.0584	-0.0003 [0.0004]	-0.0146	-0.0003 [0.0004]	-0.0146	-0.0011 [0.0008]	-0.0535	-0.001 [0.0008]	-0.0486
Fiscal Budget	-0.0204 [0.0332]	0.0498	-0.0149 [0.0290]	0.0364	-0.0743*** [0.0282]	0.1815	-0.0453* [0.0257]	0.1107	-0.1141** [0.0495]	0.2788	-0.1288*** [0.0424]	0.3147
Current Account (% GDP)	-0.1330*** [0.0208]	0.4714	-0.1375*** [0.0178]	0.4873	-0.1031*** [0.0176]	0.3654	-0.1140*** [0.0154]	0.4040	-0.0840*** [0.0187]	0.2977	-0.0842*** [0.0178]	0.2984
Solvency Ratio (debt/exports)	-0.0121*** [0.0018]	-2.6658	-0.0111*** [0.0016]	-2.4455	-0.0084*** [0.0015]	-1.8506	-0.0072*** [0.0014]	-1.5863	-0.0056** [0.0022]	-1.2338	-0.0053*** [0.0020]	-1.1677
Default dummy (20 years)	-1.2455*** [0.4294]	-0.9099	-1.1585*** [0.4079]	-0.8464	-0.4639 [0.3641]	-0.3389	-0.3248 [0.3577]	-0.2373	-0.2517 [0.6137]	-0.1839	-0.3075 [0.5871]	-0.2247
Reserves Ratio	0.0091 [0.0167]	0.1401	0.0058 [0.0144]	0.0893	0.0335** [0.0139]	0.5156	0.0249** [0.0127]	0.3832	-0.0176 [0.0270]	-0.2709	-0.0214 [0.0234]	-0.3294
Volatility External Flows	-155.7120*** [37.6048]	-0.7552	-131.2598*** [28.3887]	-0.6366	-7.4536* [3.8138]	-0.0361	-8.7014** [3.7647]	-0.0422	-173.4265*** [42.6915]	-0.8411	-115.0774*** [32.8760]	-0.5581
EMBI dummy	0.5923** [0.2979]	0.1213	0.6037** [0.2595]	0.1237	0.0683 [0.2509]	0.0140	0.0673 [0.2442]	0.0138	0.4242 [0.4211]	0.0869	0.3523 [0.3655]	0.0722
Observations	360		398		353		390		273		305	
Number of country_id	43		47		39		44		41		45	
R-squared	0.528		0.535		0.571		0.556		0.455		0.439	

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Note: M.E. refers to the product between sample mean and the coefficient for each variable.

Source: Authors' calculation.

Results on OLS and Fixed Effect Estimations do not vary considerably.¹² We describe only the results for the fixed effect estimation with time effect. First, we analyse the regressions including remittances in the volatility of external flows as well as in the solvency ratio. Not surprisingly, regressions (i), (iii) and (v) in Table 4b reveal that GDP per capita is positive and significant at the 1 per cent level. GDP growth, on the contrary, is not significant for our sample and is negatively correlated with ratings (the exception being for Moody's). A higher inflation is related to a lower rating but this result is only significant for S&P. The balance budget is negative and significant for Fitch. Although this result could be unexpected, it is not uncommon in the literature (Cantor and Packer 1996, Mora 2006), and revisits the debate on whether current account deficits display strengths or weaknesses the country's economic performance. As stated by Mora (2006), better rated countries are able to run current account deficits and borrow more easily from abroad; therefore a deficit could be seen as a sign of strength (regardless of whether it is because they are rated higher or whether the higher rating is correlated with factors that allow the country to run deficits). Both the debt to exports ratio and the external flows volatility variable are consistently negative and significant for all rating agencies. Indeed, additionally to the standard variable used to explain the impact of remittances on ratings (*i.e.* the solvency ratio), the new variable (*i.e.* the volatility indicator) helps to explain ratings. The variable *default* is negatively correlated to the sovereign rating, as expected, and is significant for S&P. The reserves-to-GDP ratio is positively related to S&P and Moody's ratings, highlighting the increasing role of precautionary reserves for impeding defaults. Regressions (ii), (iv) and (vi) consider the new variables excluding remittances from both the debt to exports ratio and the external flows volatility variable: they show very similar results.

III.4. Counterfactual analysis for Latin America – General Model

To assess the potential effect that the modified solvency ratio and modified volatility indicator could have on ratings for Latin American countries, we construct a simple counterfactual scenario, looking at the rating evolution when remittance flows are taken into account. We use the observed debt to exports ratio and the counterfactual debt to exports ratio that we estimated for the previous regressions, this is, excluding remittance flows (TDX_wr). By the same token, we use the observed volatility indicator and the counterfactual volatility indicator that we estimated for the previous regressions, this is, excluding remittance flows (volat_indicator_wr). We estimate our initial model with the counterfactual variable:

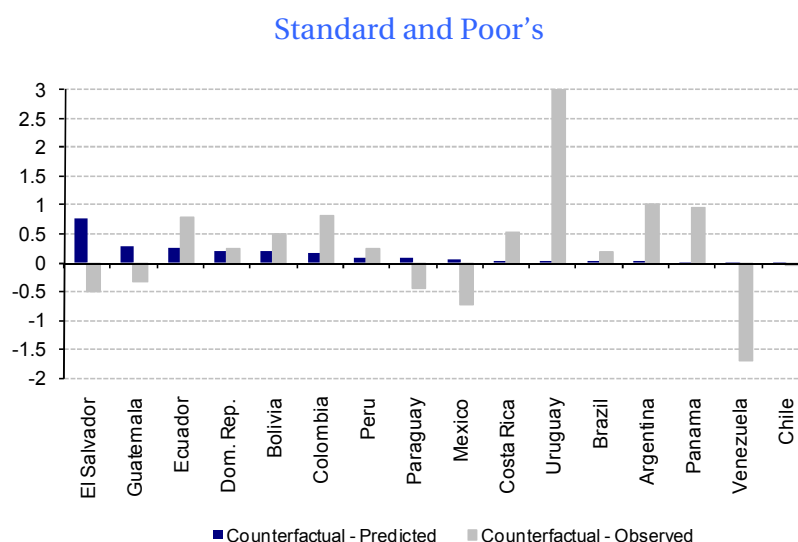
¹² We check for the presence of multicollinearity in the general model by computing the variance inflation factors. The tolerance for all variables included in the model was close to 1, confirming the absence of collinearity between regressors. As a robustness check, we also estimate correlations between fixed effects and country ratings. We find a correlation of 0.25 for S&P, 0.30 for Moody's and 0.24 for Fitch, which is reasonably low.

$$Rating_{i,t} = \beta_0 + \beta_1 GDP_pc + \beta_2 GDP_growth_{i,t} + \beta_3 Inflat_{i,t} + \beta_4 Fisc_budg_{i,t} + \beta_5 CA_{i,t} + \beta_6 TDX_wr_{i,t} + \beta_7 Default_{i,t} + \beta_8 Reserves_{i,t} + \beta_9 Volat_indicator_wr_{i,t} + \beta_{10} EMBI_{i,t} + \tau_t + \varepsilon_{i,t}$$

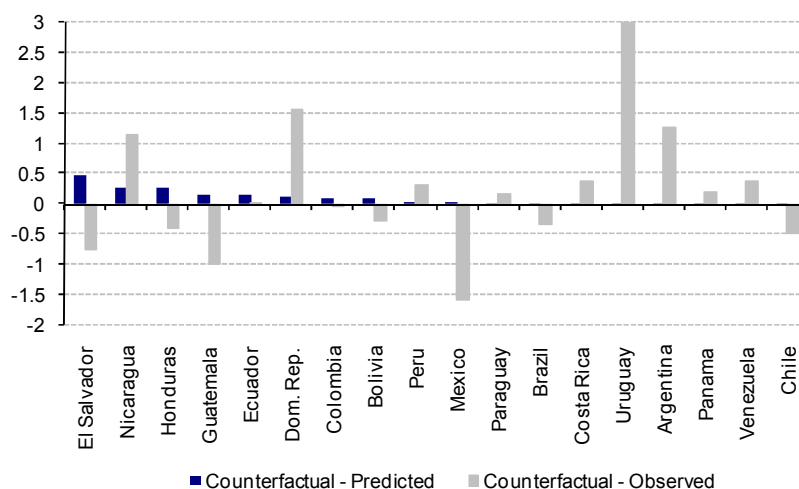
and we obtain the vector $\hat{\beta}$ as the fixed-effect estimator. Then, we use the observed debt to exports ratio (TDX) as well as the external flows volatility variable (volat_indicator) and calculate the change in the rating using these both variables and the $\hat{\beta}$ coefficients. We obtain the potential improvement in the sovereign ratings for the Latin American countries included in the sample. Annexes 4a, 4b, and 4c depict i) the observed rating for S&P, Moody's and Fitch, respectively ("Observed" Y in the figures); ii) the predicted rating ("Predicted" \hat{Y} in the figures) estimated taking into account the TDX_wr ratio (debt to exports ratio excluding remittances) and the *volat_indicator_wr* ratio (volatility of external flows excluding remittances); iii) the counterfactual rating in the scenario including workers' remittances in our variable of interests, debt/exports and volatility of external flows ("Counterfactual" \tilde{Y} in the figures).

Figure 4 compares three types of ratings: the observed rating, the predicted rating (estimated from a model by excluding remittances from the solvency ratio and from the external flows volatility) and the counterfactual rating (calculated from the estimators of the predicted model and by including remittances in the two core explanatory variables: solvency ratio and volatility of external flows).

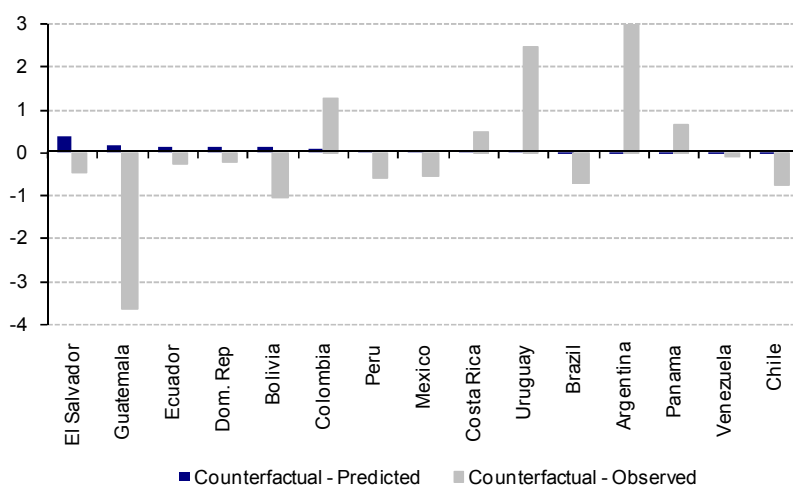
Figure 4. Observed, Predicted and Counterfactual Ratings in 2006



Moody's



Fitch



Note: Unity is equivalent to one notch.

Source: Authors based on of Fitch (2008a), Moody's (2008a) and Standard and Poor's (2007).

Figure 4 presents the ratings given by Fitch, Moody's and Standard and Poor's in 2006. For instance, by analysing the case of S&P, we note that for countries with high levels of remittances over GDP (e.g., El Salvador, Guatemala, Ecuador and Dominican Republic), there is a relative high difference between the predicted rating and the counterfactual rating, showing that by including remittances, estimated ratings can improve for these countries. For the case of El Salvador, estimated rating can improve close to one notch when remittances are included. However, a question remains: are CRAs already including remittances in their own models? By comparing the counterfactual rating and the observed rating, these ratings do not change considerably for countries with high levels of remittances over GDP. Indeed, for other countries,

like Uruguay or Venezuela, changes are substantially more important. Moreover, for the set of countries with high levels of remittances, it is not clear that the observed rating is less favourable than the counterfactual rating (positive sign in the figure). For the case of El Salvador and Guatemala, observed ratings are more favourable than the counterfactual rating, meaning that Standard and Poor's ratings are more favourable than those yielded in a statistical model including remittances. By contrast, for Ecuador and Dominican Republic, the inverse case is found: the statistical model with remittances is more favourable than Standard and Poor's.

Including the debt to exports ratio and the volatility of external flows in the estimation does not substantially alter the results. We infer that including remittances in the rating agencies' model does not improve most Latin American countries' ratings. To check the robustness of this result, we test the opposite estimation, using the variables *TDX* and *Volat_indicator* as follows:

$$\begin{aligned} Rating_{i,t} = & \beta_0 + \beta_1 GDP_pc + \beta_2 GDP_growth_{i,t} + \beta_3 Inflat_{i,t} + \beta_4 Fisc_budg_{i,t} + \beta_5 CA_{i,t} + \beta_6 TDX_{i,t} \\ & + \beta_7 Default_{i,t} + \beta_8 Re_serves_{i,t} + \beta_9 Volat_indicator_{i,t} + \beta_{10} EMBI_{i,t} + \tau_t + \varepsilon_{i,t} \end{aligned}$$

and doing the counterfactual with the variable excluding remittances (*TDX_wr*). These results are very similar to those presented in Annex 4.¹³

III.5. Model for High-Remittance Receptors

Sovereign ratings are the output of a qualitative and quantitative analysis of credit risk. They are generally assigned on a case-by-case basis. This is in line with previous research (e.g. Roubini and Manasse, 2005) showing that there is not a single model to rate countries, which implies that not all variables have the same impact on ratings.

In that context, the wide range of countries in the sample does not permit to fully isolate the impact of remittances. Initially, we would expect that for those countries where remittances have a non-negligible weight in the economy (as a share of GDP), the change in our two benchmark variables (*i.e.* solvency ratio and volatility indicator) including and excluding remittances would be significant. For this reason, we calculate a threshold variable (for each country and year) taking the value 1 when the ratio Remittances/GDP is higher than a given threshold and zero otherwise. The objective is to identify those countries and years where remittances are more important. Note that this dummy is non constant over time, and therefore can be included in the fixed-effect panel. Then, we calculate a crossed term with the non-constant dummy and the variables *TDX* and *Volat_indicator*, that will detect the interaction effect between countries with a high share of remittances and our variable of interest.¹⁴

13 These results are not reported but they can be provided upon request.

14 We tested other configurations to take into account the importance of isolating those ratings most likely to be affected by remittance flows. We included the remittances to GDP ratio as an explanatory variable, but this was not significant for the sample. Also, we split the sample into different groups,

Thus, we test the following model for the whole sample:

$$\begin{aligned} Rating_{i,t} = & \beta_0 + \beta_1 GDP_pc + \beta_2 GDP_growth_{i,t} + \beta_3 Inflat_{i,t} + \beta_4 Fisc_budg_{i,t} + \beta_5 CA_{i,t} + \beta_6 TDX_{i,t} + \beta_7 Default_{i,t} \\ & + \beta_8 Reserves_{i,t} + \beta_9 Volat_indicator_{i,t} + \beta_{10} EMBI_{i,t} + \beta_{11} Threshold \times TDX + \beta_{12} Threshold \times Volat_indicator_{i,t} \\ & + \beta_{13} Threshold + \tau_t + \nu_i + \varepsilon_{i,t} \end{aligned}$$

where *Threshold* takes the value 1 when the ratio Remittances/GDP is higher than a given percentage and zero otherwise. *Threshold* × *TDX* and *Threshold* × *Volat* *indicator* are the interaction effects between countries with a high share of remittances and the ratio debt over exports and the volatility of external flows respectively.

Table 5 summarizes the results using two different thresholds: 3.5 and 5.0 per cent, respectively.¹⁵

Table 5. Regression with Threshold Model

	Threshold: 3.5%						Threshold: 5.0%					
	S&P	ME	Moody's	ME	Fitch	ME	S&P	ME	Moody's	ME	Fitch	ME
GDP per capita (PPP)	0.0010*** [10.66]	4.1235	0.0011*** [11.55]	4.5359	0.0009*** [7.016]	3.7112	0.0010*** [10.02]	4.1235	0.0011*** [11.05]	4.5359	0.0009*** [6.713]	3.7112
GDP growth (annual)	-0.0403* [-1.793]	-0.1528	-0.0411** [-2.105]	-0.1558	-0.0293 [-1.276]	-0.1111	-0.0391* [-1.700]	-0.1483	-0.0404** [-2.046]	-0.1532	-0.0182 [-0.769]	-0.0690
Annual inflation	-0.0013** [-2.313]	-0.0632	-0.0002 [-0.580]	-0.0097	-0.0013* [-1.657]	-0.0632	-0.0013** [-2.253]	-0.0632	-0.0002 [-0.528]	-0.0097	-0.0013 [-1.631]	-0.0632
Fiscal Budget	-0.0266 [-0.807]	0.0650	-0.1006*** [-3.454]	0.2458	-0.1322*** [-2.881]	0.3230	-0.0129 [-0.385]	0.0315	-0.0940*** [-3.194]	0.2297	-0.1380*** [-2.935]	0.3372
Current Account (% GDP)	-0.1434*** [-6.295]	0.5082	-0.0864*** [-4.281]	0.3062	-0.0987*** [-4.939]	0.3498	-0.1513*** [-6.450]	0.5362	-0.0874*** [-4.294]	0.3098	-0.0903*** [-4.462]	0.3200
Default dummy (20 years)	-1.3138*** [-3.274]	-0.9598	-0.5424 [-1.570]	-0.3963	-0.1716 [-0.299]	-0.1254	-1.0027** [-2.480]	-0.7326	-0.4581 [-1.317]	-0.3347	-0.2202 [-0.374]	-0.1609
Reserves Ratio	-0.0066 [-0.418]	-0.1016	0.0244* [1.773]	0.3755	-0.0514* [-1.920]	-0.7911	0.0079 [0.497]	0.1216	0.0303** [2.204]	0.4663	-0.0421 [-1.543]	-0.6480
Volatility External Flows	-312.0530*** [-5.696]	-1.5134	-195.1693*** [-3.875]	-0.9465	-249.3902*** [-4.564]	-1.2095	-342.0850*** [-6.104]	-1.6590	-206.4371*** [-4.047]	-1.0012	-227.5125*** [-4.155]	-1.1034
EMBI dummy	1.0101*** [3.601]	0.2069	0.4642* [1.673]	0.0951	0.8636** [2.211]	0.1769	1.0865*** [3.825]	0.2226	0.4466 [1.595]	0.0915	0.9120** [2.260]	0.1868
Threshold dummy x (Debt/exports)	-0.0024 [-0.528]	-0.5288	0.0011 [0.424]	0.2423	-0.0059 [-1.248]	-1.2999	-0.0026 [-0.467]	-0.5728	0.0006 [0.210]	0.1322	-0.0126 [-1.624]	-2.7760
Threshold dummy x (Volat. External flow)	249.2837** [2.188]	1.2090	192.9201** [2.036]	0.9356	125.1364 [1.202]	0.6069	344.1124*** [2.872]	1.6689	266.8429*** [2.703]	1.2941	199.7961 [1.362]	0.9690
Solvency Ratio (debt/exports)	-0.0138*** [-7.347]	-3.0403	-0.0073*** [-4.252]	-1.6083	-0.0033 [-1.368]	-0.7270	-0.0142*** [-7.378]	-3.1285	-0.0073*** [-4.188]	-1.6083	-0.0030 [-1.181]	-0.6609
Threshold dummy	1.9482*** [2.800]	0.6561	0.4949 [1.048]	0.1667	2.2861*** [2.735]	0.7699	1.6866** [2.076]	0.5680	-0.1518 [-0.302]	-0.0511	0.9084 [0.671]	0.3059
Observations	334		314		253		334		314		253	
Number of country_id	43		39		41		43		39		41	
R-squared	0.59		0.57		0.50		0.57		0.56		0.47	

t statistics in brackets

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

Note: M.E. refers to the product between the sample mean and the coefficient for each variable. For interactive variables the M.E. is calculated only for countries with threshold dummy equal to 1.

Source: Authors' calculation.

following the World Bank classification (lower income/middle income/higher income, etc.) and performed regressions on each group. Finally, we opted for the non-constant dummy variable.

15 We test for the robustness of the estimation by running a pooled regression with all observations, should the individual effects affect the estimation. We find that for both specifications (general and threshold model), the solvency ratio and the volatility of external flows are consistently significant and negative.

Regressions in Table 5 allow isolating the effect that remittances can have for those countries where they are more important. With the 3.5 per cent threshold, the dummy variable is significant for two agencies. The interactive term for the volatility of external flows, also, is positive and significant. Increasing the threshold to 5 per cent does have a significant and positive effect on the dummy variable for S&P only. It does affect the interactive variable, with a positive and significant effect on the sovereign rating (S&P and Moody's). By contrast, the interactive dummy variable of the solvency ratio is not significant.¹⁶

This result suggests that for remittance-dependent countries, high remittances do not have necessarily a direct effect on ratings (the dummy variable remittances over GDP is significant for some agencies and dependent on the threshold used). If a country is highly dependent on remittances, this does not automatically mean that markets' perception about this country is going to improve.

However, the solvency ratio and the external flows volatility variable (by including remittances) are significant for most of the CRAs. Moreover, the interaction term between the remittances to GDP ratio and the flows volatility is significant to explain ratings, denoting that the negative impact of the volatility of external flows on ratings is reduced. In other words, remittances have above all an indirect and positive impact on ratings through a premium (captured with the interactive dummy variable remittances over GDP and the volatility of external flows). Indeed, there is an insight. The indirect impact of remittances on ratings goes mainly through the volatility of external flows (and not through the solvency ratio, as argued in previous research on sovereign ratings and remittances).

For countries where the remittances to GDP ratio is higher than 5 per cent, the elasticity of the rating with respect to the external flows variable is $\beta_9 + \beta_{12}$. Since β_{12} is positive, the weight of the external flows variable is reduced. We find that including an interaction term between the remittances to GDP ratio and the external flows variable denotes a more inelastic rating for those countries where precisely remittances are more important. For countries with high remittances to GDP ratio, there is an indirect effect of remittances. Besides, the negative impact of the volatility of external flows on their ratings can be attenuated. In any case, as it is depicted in Annex 5, the effect is somehow limited.

Results support the view that CRAs do take remittance flows into account to rate sovereigns. This variable turns out to be significant for a limited set of countries, specifically those that are small in size and classified in the low and middle income categories. A favourable trend of remittances can improve ratings but the reverse scenario also applies. Such findings explain why in the current economic crisis, five out of the seven rated countries with the highest remittances to GDP ratios in the region have been downgraded or have faced a worsening of their rating outlook (from positive to stable or from stable to negative).¹⁷

16 For the threshold model, we also estimate correlations between fixed effects and country ratings. The correlation with S&P is -0.01, 0.28 for Moody's and 0.24 for Fitch. These low correlations allow us to believe that estimation and prediction do not depend solely on the countries' fixed effect.

17 Since September 2008, Jamaica, El Salvador, Guatemala, Dominican Republic, and Ecuador have been downgraded and/or their outlooks have worsened. The two countries with stable ratings are

However, the impact of including remittances in both the solvency ratio and the external flows volatility ratio remains weak with respect to other fundamental variables that affect ratings. This suggests that other factors, such as the reduction of debt service, the lowering of the foreign currency debt and the deepening of local currency financial markets may be more relevant to explain ratings.

III.6. Shadow ratings for unrated countries by CRAs

The credit rating issued by major international rating agencies is a key aspect affecting a sovereign's access to capital markets. Even if sovereign bonds do not always need ratings to be placed in the international capital markets, it is common practice to have them rated, given the necessity of institutional investors to have a benchmark for credit risk. Indeed, while their participation is not strictly needed in a legal sense, domestic or international prudential regulations, which rely on ratings and place limits on the purchase of unrated securities, make them necessary in practice.¹⁸ This is even more important today than in the past because other capital markets' signals about credit risk that existed in the past are no longer valid today (Flandreau, Flores, Gaillard and Nieto, 2009).

Moreover, sovereign ratings generate externalities. First, they might help to draw more investors' attention and therefore attract more capital flows. Sovereign ratings can be considered a benchmark for investors' decisions in private bond and equity markets as well as in foreign direct investment. Second, sovereign ratings are often the ceiling for sub-sovereign as well as corporate foreign currency ratings.

Somewhat surprisingly, given the benefits of a rating, a large number of developing countries remain unrated today. High fixed costs, lack of information and of incentives may be responsible for this. According to Ratha, De and Mohapatra (2007), "70 developing countries – mostly poor – and 12 high-income countries do not have a rating from a major rating agency. Of the 86 developing countries that have been rated, the rating was established in 2004 or earlier for 15 countries". Similar results are found for the coverage made by investment banks in their reports to developing and emerging countries (Nieto-Parra and Santiso, 2007).¹⁹

What would be the "shadow ratings" for unrated Latin American and Caribbean countries? Table 6 presents two series of periods covering shadow and potential ratings

Honduras and Nicaragua. Guyana and Haiti are not taking into account given they do not have ratings.

18 Moreover, the Basel II regulatory framework could penalize unrated securities (Basel Committee on Banking Supervision, 2005).

19 Country coverage by leading investment banks and leading emerging-market benchmarks like the EMBI produced by JP Morgan for the bond markets or leading global banks like Citigroup, Deutsche Bank, HSBC, JP Morgan or Morgan Stanley, rarely cover or sample more than 35 economies. The other 120 developing countries simply do not exist for global financial-market investors. Only 10 countries enjoyed systematic coverage from the major financial institutions.

respectively for each country and agency.²⁰ The naming “shadow ratings” concerns unrated countries for a given year and a specific agency, while “potential ratings” refer to countries that were already assigned a rating by a specific agency for a given year.

Table 6. Shadow and Potential Ratings by CRA and by Country

	"Shadow ratings"			"Potential ratings"		
	S&P	Moody's	Fitch	S&P	Moody's	Fitch
Argentina	NA	NA	1993:1997	1993:2006	1993:2006	1997:2006
Bolivia	1993:1997	1993:1997	1993:2003	1998:2006	1998:2006	2004:2006
Brazil	1993	NA	1993	1994:2005	1993:2005	1994:2005
Chile	NA	1993:1998	1993:1995	1993:2006	1999:2006	1996:2006
Colombia	NA	NA	1993	1993:2006	1993:2006	1994:2006
Costa Rica	1995:1996	1995:1996	1995:1997	1997:2006	1997:2006	1998:2006
Dominican Rep.	1995:1996	1995:1998	1995:2002	1997:2006	1999:2006	2003:2006
Ecuador	1993:1999	1993:1996	1993:2001	2000:2006	1997:2006	2002:2006
El Salvador	1993:1995	1993:2001	1993:1995	1996:2006	2002:2006	1996:2006
Guatemala	1993:2000	1993:1996	1993:2005	2001:2006	1997:2006	2006
Honduras	1993:2006	1993:1998	1993:2006	NA	1999:2006	NA
Mexico	NA	NA	1993:1995	1993:2006	1993:2006	1995:2006
Nicaragua	2002:2006	NA	2002:2006	NA	2002:2006	NA
Panama	1994:1996	1994:1996	1994:1997	1997:2006	1997:2006	1998:2006
Paraguay	NA	1995:1997	1995:2006	1995:2006	1998:2006	NA
Peru	1993:1996	1993:1998	1993:1998	1997:2006	1999:2006	1999:2006
Uruguay	NA	NA	NA	2002:2006	2002:2006	2002:2006
Venezuela	NA	NA	NA	2003:2006	2003:2006	2003:2006

Note: This table presets the periods covering shadow ratings for the general model. Periods covering Shadow ratings for unrated and highly dependent countries are exhibited in Annex 6.

Source: The authors based on Fitch (2008a), Moody's (2008a) and S&P (2007).

In Annex 4, “shadow” and “potential” ratings are calculated for the general model.²¹ As we noted before, CRAs do not have a unique model to assign ratings. Therefore, we calculate as well “shadow ratings” for unrated and highly dependent countries (see Annex 5). In particular, shadow ratings are estimated for Latin American and Caribbean countries which are highly dependent on remittances (*i.e.* Honduras, El Salvador, Nicaragua, Guatemala, Dominican

20 Shadow ratings were reassessed including the fixed effect independently. The reassessed ratings for S&P were: Bolivia, Costa Rica, Dominican Republic, Ecuador, El Salvador and Guatemala. For Moody's: Bolivia, Chile, Costa Rica, Dominican Republic, Honduras, Panama, Paraguay and Peru. For Fitch: Bolivia, Chile, Dominican Republic, Ecuador, Nicaragua and Panama.

21 More precisely, “shadow” and “potential” ratings are considered equally as “predicted ratings” and compared with the counterfactual ratings.

Republic and Ecuador) according to a specific model. For instance, the shadow ratings of Fitch for Honduras and Nicaragua are B- and CCC+ respectively, while the shadow ratings of S&P for these both countries are B.

As pointed by Nieto-Parra and Santiso (2007), a partnership agreement could be reached between a leading international organisation, supported by donor agencies, and a “market maker” in emerging markets, in order to boost country coverage. Experiences of public-private partnerships have already been implemented in order to improve country coverage. For some years now, Standard & Poor’s, one of the leading rating agencies, has provided coverage for African sovereigns, with the support of UNDP (United Nations Development Programme). In 2006, 14 sovereigns were rated. Likewise, aiming to improve the region’s economic coverage, the OECD Development Centre and the African Development Bank launched the African Economic Outlook in 2001. By providing a number of indicators (on macroeconomic performance but also aid flows, exports, public finances, FDI, poverty, income distribution, employment, trade diversification, civil tensions and health, among others) and country-level analysis, the report provides key economic, financial and political factors to determine sovereign ratings in the region. A potential partnership can facilitate the understanding of the benefits of ratings to interested governments and encourage their request.

IV. CONCLUSION

This paper analyses the impact of remittance flows on sovereign ratings for developing and emerging countries over the period 1993-2006. Our hypothesis is that they may have served to significantly reduce country risk for smaller economies. In order to capture the impact of remittances on sovereign risk, we focus on two core variables. We test a traditional solvency ratio, already used in the literature and we introduce another determinant, the volatility of external flows.

First, using a model of the determinants of sovereign ratings and then a counterfactual estimation, we find that the impact of including remittances in both the solvency ratio and the external flows volatility on ratings is modest. This suggests that other factors, such as the reduction of debt service, the lowering of the foreign currency debt and the deepening of local currency financial markets may be more relevant to explain ratings.

Second, there is no single model to rate countries and variables highlighted by agencies do not have the same impact on sovereign ratings.²² In that context we estimated a specific model for countries with relatively high levels of remittances. Our results support the view that remittance flows have an influence on small low and middle income Central American and Caribbean countries. This impact of remittances depends more on the volatility of external flows than on the solvency ratio (debt over exports). Nevertheless, the recent wave of downgrades of several remittance-dependent countries due to the drop in remittances may suggest that those have procyclical effects in times of market turmoil (five out of the seven rated countries with the highest remittances to GDP ratios have been downgraded or have faced a worsening of their rating outlook since September 2008).

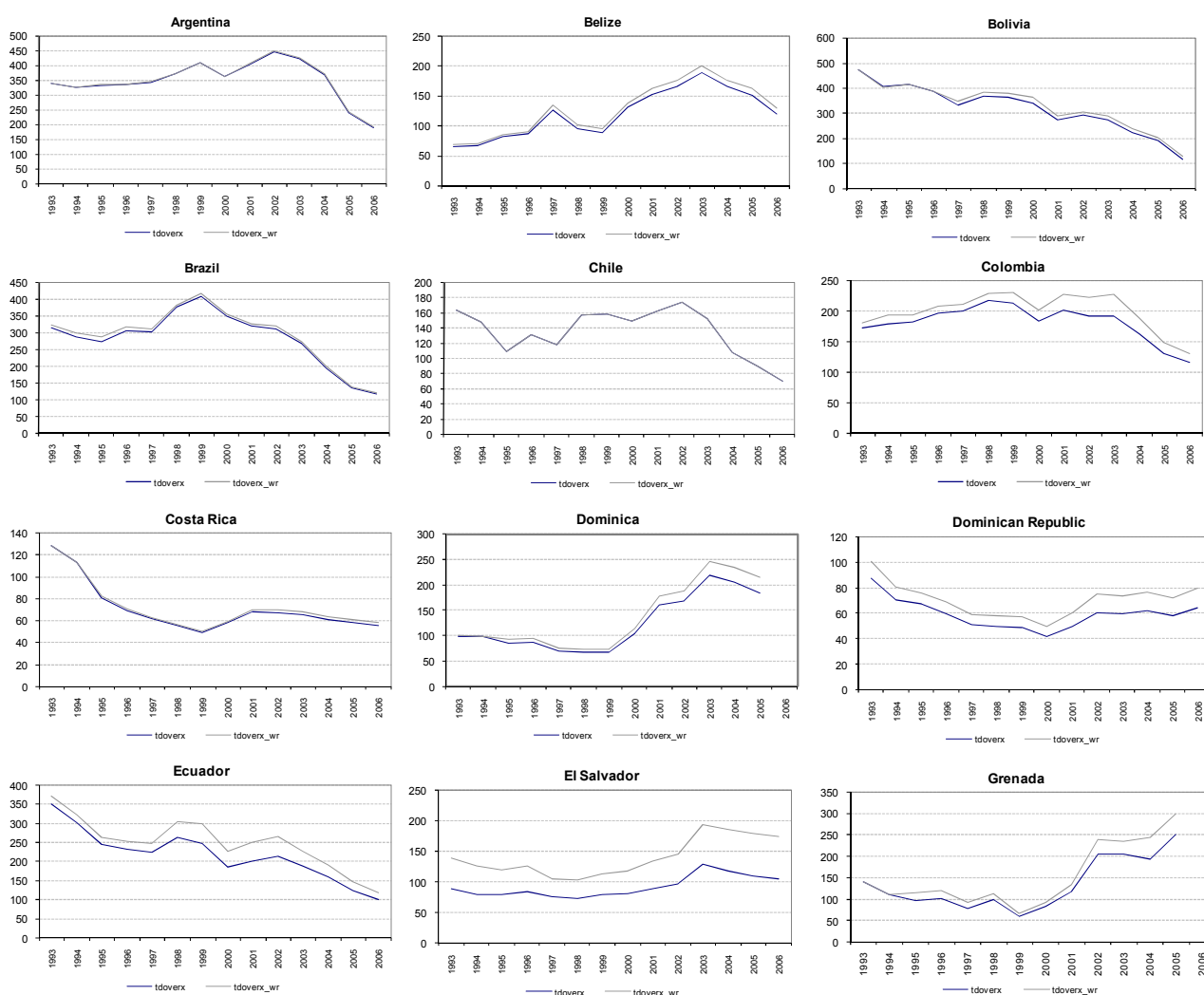
Third, this research also provides *shadow* ratings for countries which are not rated by the three main CRAs, in particular some Central American and Caribbean countries, where relative remittance flows are high. Our analysis provides useful information on the potential ratings of these countries, thus indicating their creditworthiness to international investors. In that context, a public-private partnership could be reached in order to boost country coverage. Such initiatives are not without precedent: for some years Standard & Poor's has provided rating coverage of some African sovereigns with support from the United Nations Development Programme. Additionally, other types of partnership can also be envisaged at the inter-governmental level, involving public officials with an interest in these regions. Public donors both from OECD and non-OECD countries, gathered at the Development Centre, may be interested to deploy an initiative for sovereign rating's coverage, as a way to enhance countries' financial visibility and encourage cooperation.

22 This goes in line with previous research (Roubini and Manasse, 2005).

ANNEXES

Annex 1

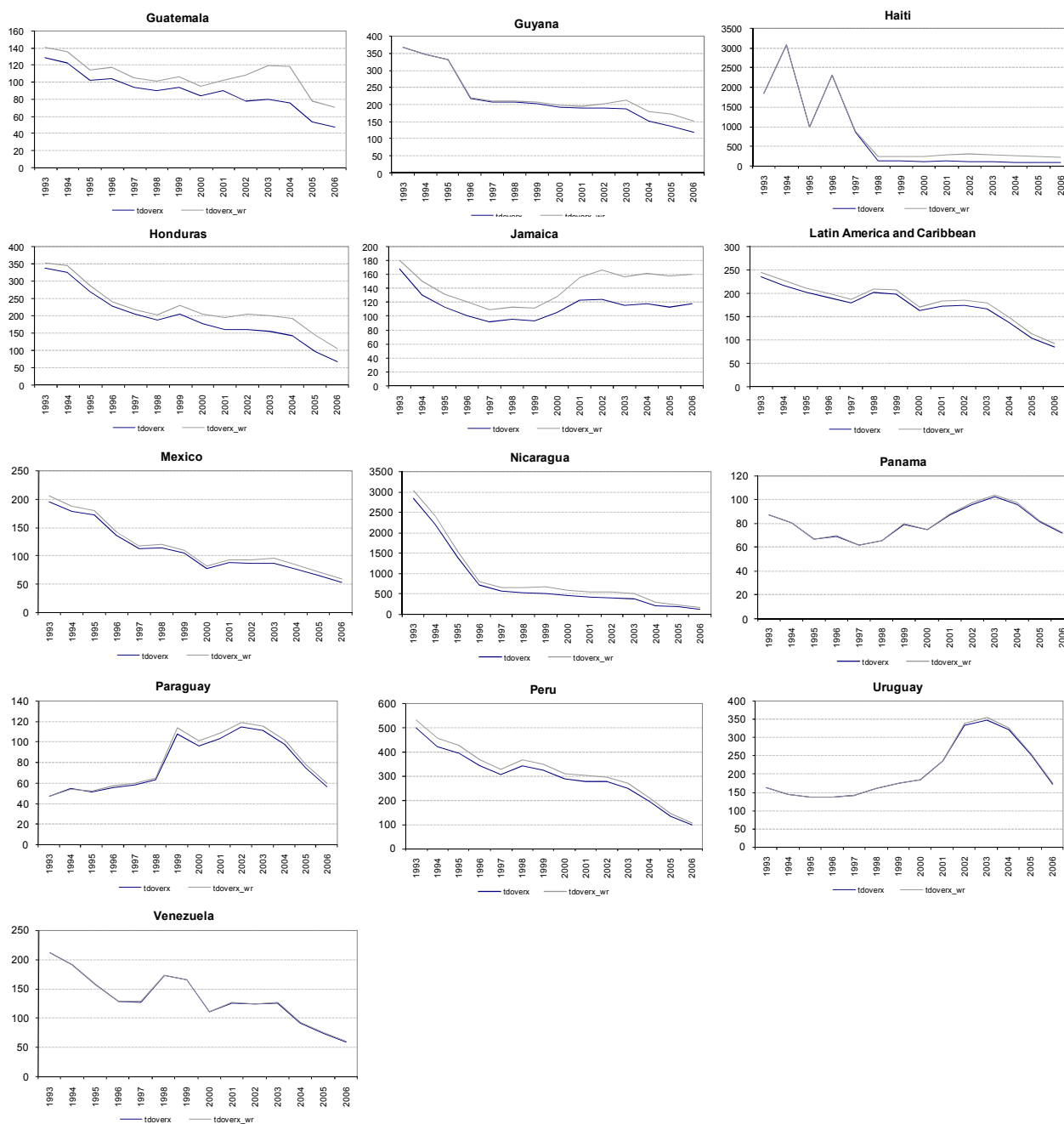
Ratio of External debt over Exports (tdoverx_wr) and over Exports and Remittances (tdoverx) Latin American and Caribbean countries



Source: Global Development Finance and International Financial Statistics, 2009.

Annex 1 (cont.)

Ratio of External debt over Exports (tdoverx_wr) and over Exports and Remittances (tdoverx) Latin American and Caribbean countries



Source: Global Development Finance and International Financial Statistics, 2009.

Annex 2
Annex 2a. Determinants of Sovereign Ratings (1993-2006)
Cantor and Packer (1996), Rowland and Torres (2004)

	Cantor and Packer						Rowland and Torres					
	S&P		Moody's		Fitch		S&P		Moody's		Fitch	
	(i) With Remittances	(ii) Without Remittances	(iii) With Remittances	(iv) Without Remittances	(v) With Remittances	(vi) Without Remittances	(vii) With Remittances	(viii) Without Remittances	(ix) With Remittances	(x) Without Remittances	(xi) With Remittances	(xii) Without Remittances
gdp_per_cap_ppp_curr	0.0011*** [12.59]	0.0011*** [12.44]	0.0012*** [15.38]	0.0012*** [15.23]	0.0011*** [10.58]	0.0011*** [10.58]						
gdp_growth_annual	-0.0729*** [3.61]	-0.0720*** [3.55]	-0.0516*** [3.20]	-0.0507*** [3.13]	-0.0467** [2.27]	-0.0468** [2.28]	-0.0086 [0.40]	-0.0086 [0.40]	-0.0023 [0.12]	-0.003 [0.15]	-0.0466** [2.30]	-0.0478** [2.36]
inflat_annual	-0.0012* [1.92]	-0.0012* [1.88]	-0.0003 [0.91]	-0.0004 [0.93]	-0.001 [1.25]	-0.001 [1.23]	-0.0012 [1.60]	-0.0012 [1.60]	-0.0010** [1.98]	-0.0010* [1.96]	-0.0003 [0.41]	-0.0003 [0.44]
fisc_budget_our	0.0184 [0.66]	0.0193 [0.69]	-0.0427* [1.81]	-0.0415* [1.75]	-0.1157*** [3.22]	-0.1145*** [3.19]						
current_account_bal_%gdp	-0.1543*** [8.75]	-0.1535*** [8.64]	-0.1109*** [7.77]	-0.1105*** [7.69]	-0.0774*** [4.53]	-0.0783*** [4.58]						
tdoverx	-0.0129*** [7.58]	-0.0116*** [7.18]	-0.0088*** [6.25]	-0.0076*** [5.86]	-0.0071*** [3.66]	-0.0065*** [3.56]	0.0089*** [3.20]	0.0093*** [3.62]	0.0070*** [2.66]	0.0066*** [2.75]	0.0180*** [6.11]	0.0164*** [6.08]
default_20	-0.8783** [2.27]	-0.7872** [2.03]	-0.3678 [1.14]	-0.3079 [0.95]	0.0096 [0.02]	0.0755 [0.15]	-2.3087*** [5.32]	-2.3789*** [5.50]	-1.3330*** [3.19]	-1.3697*** [3.29]	-0.3488 [0.67]	-0.5101 [0.97]
tdovergnp							-0.0581*** [7.68]	-0.0602*** [7.99]	-0.0385*** [5.70]	-0.0391*** [5.75]	-0.0734*** [9.70]	-0.0727*** [9.68]
tdtdovergnp							0.0491* [1.86]	0.0479* [1.82]	0.0374 [1.56]	0.0391 [1.64]	0.0384 [1.45]	0.0435 [1.64]
res_gnp							0.0375** [2.38]	0.0385** [2.45]	0.0538*** [3.77]	0.0547*** [3.84]	0.0596*** [3.05]	0.0614*** [3.14]
openness							0.0025 [0.31]	0.0035 [0.45]	-0.0047 [0.66]	-0.0045 [0.64]	0.0178** [2.19]	0.0170** [2.10]
log_res												
log_bank_res_to_bank_assets												
log_tdtsoverx												
log_tdoovergnp												
Observations	427	428	417	418	334	335	497	497	477	477	363	363
Number of country_id	49	49	46	46	47	47	55	55	49	49	50	50
R-squared	0.53	0.52	0.57	0.56	0.45	0.45	0.27	0.27	0.22	0.23	0.33	0.33

Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Authors' calculation.

Annex 2 (cont.)
Annex 2b. Determinants of Sovereign Ratings (1993-2006)
Sutton (2005)

	S&P		Sutton Moody's		Fitch	
	(xiii)	(xiv)	(xv)	(xvi)	(xvii)	(xviii)
	With Remittances	Without Remittances	With Remittances	Without Remittances	With Remittances	Without Remittances
gdp_per_cap_ppp_curr						
gdp_growth_annual						
inflat_annual						
fisc_budget_our						
current_account_bal_%gdp						
tdoverx						
default_20	-2.2285*** [5.64]	-2.2598*** [5.73]	-1.2746*** [3.43]	-1.3135*** [3.53]	-0.3887 [0.81]	-0.4226 [0.88]
tdovergnp						
tdtdsovergnp						
res_gnp						
openness						
log_res	1.8452*** [9.72]	1.8383*** [9.69]	1.6582*** [10.46]	1.6515*** [10.39]	1.9091*** [9.06]	1.9046*** [9.03]
log_bank_res_to_bank_assets	-0.8874*** [5.33]	-0.8789*** [5.27]	-0.6375*** [4.48]	-0.6345*** [4.44]	-0.9255*** [4.65]	-0.9210*** [4.61]
log_tdtsoverx	0.8156*** [4.07]	0.8232*** [4.13]	0.9460*** [5.23]	0.9063*** [4.98]	0.7199*** [3.45]	0.7167*** [3.42]
log_tdovergnp	-1.7675*** [6.43]	-1.7797*** [6.46]	-1.3803*** [5.74]	-1.3590*** [5.63]	-1.7545*** [6.34]	-1.7517*** [6.33]
Observations	488	488	479	479	361	361
Number of country_id	55	55	50	50	49	49
R-squared	0.4	0.4	0.38	0.37	0.42	0.42

Absolute value of t statistics in br Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Authors' calculation.

Annex 2 (cont.)
Annex 2c. Determinants of Sovereign Ratings (1993-2006)
Mora (2006)

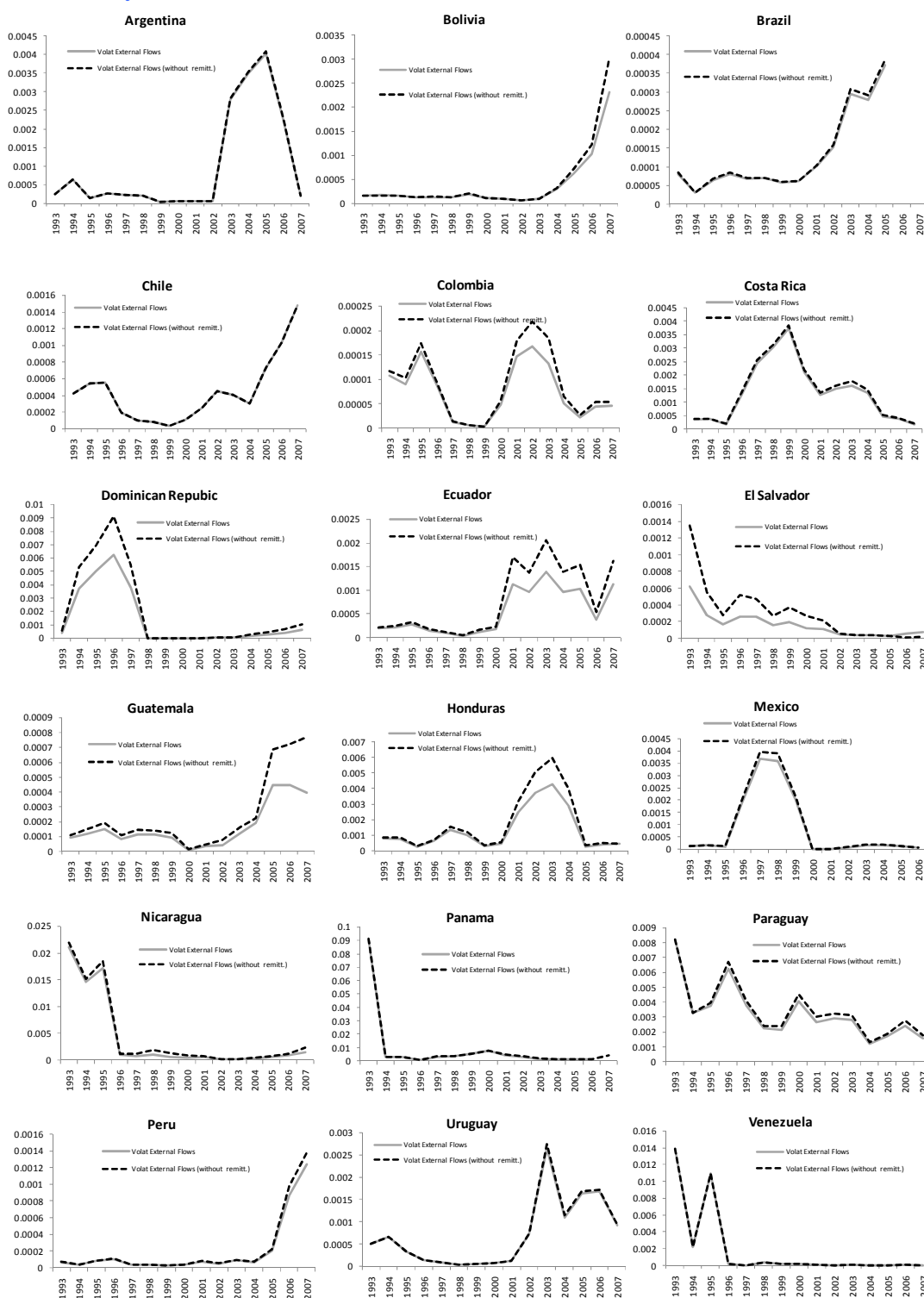
	Mora (level variable)						Mora (lagged variable)					
	S&P		Moody's		Fitch		S&P		Moody's		Fitch	
	(i) With Remittances	(ii) Without Remittances	(iii) With Remittances	(iv) Without Remittances	(v) With Remittances	(vi) Without Remittances	(vii) With Remittances	(viii) Without Remittances	(ix) With Remittances	(x) Without Remittances	(xi) With Remittances	(xii) Without Remittances
gdp_per_cap_ppp_curr	0.0012*** [10.34]	0.0012*** [10.37]	0.0014*** [14.06]	0.0015*** [14.18]	0.0010*** [6.52]	0.0010*** [6.50]	0.0001 [1.18]	0.0002 [1.22]	0.0002*** [2.99]	0.0011 [0.65]	-0.0022 [4.68]	0.0001 [2.43]
gdp_growth_annual	-0.0877*** [4.57]	-0.0871*** [4.55]	-0.0741*** [4.40]	-0.0746*** [4.46]	-0.0574** [2.54]	-0.0587** [2.60]	0.1089*** [5.11]	0.1098*** [5.17]	0.0001 [1.97]	0.0680*** [3.01]	0.0001 [0.76]	-0.3482 [4.72]
inflat_annual	-0.0012 [0.18]	-0.001 [0.15]	-0.0005 [0.62]	-0.0005 [0.62]	-0.0034 [0.32]	-0.0039 [0.37]	-0.0082 [1.10]	-0.0079 [1.06]	0.0011 [0.07]	0.0001 [2.15]	0.0008 [0.52]	0.0859*** [1.89]
fisc_budget_our	0.0353 [1.22]	0.0358 [1.24]	-0.0645** [2.54]	-0.0653** [2.58]	-0.0141 [0.35]	-0.0158 [0.39]	0.0199 [0.62]	0.0206 [0.64]	-0.0033* [1.44]	0.0541 [0.15]	0.0776** [0.10]	0.0011 [0.94]
current_account_bal_%gdp	-0.0931*** [4.96]	-0.0929*** [4.95]	-0.0788*** [4.67]	-0.0796*** [4.74]	-0.0708*** [3.02]	-0.0713*** [3.03]	0.0549*** [2.64]	0.0553*** [2.66]	0.0206 [1.44]	0.0207 [1.45]	0.0273 [1.44]	0.0275 [1.45]
tdoverx	-0.0041* [1.87]	-0.0039* [1.87]	-0.0041** [2.07]	-0.0045** [2.40]	0.0036 [1.42]	0.003 [1.22]	-0.0041* [1.67]	-0.0037 [1.60]	0.0462** [4.75]	0.0463** [1.43]	-0.3658 [1.06]	-0.0019 [0.13]
default_20	-0.4623 [0.93]	-0.4338 [0.87]	-0.135 [0.31]	-0.1095 [0.26]	0.4407 [0.73]	0.4112 [0.68]	0.0814 [0.15]	0.1105 [0.20]	0.0677*** [0.60]	0.0002*** [4.78]	0.0852*** [2.40]	0.0784** [0.52]
spread	-0.0010*** [8.38]	-0.0010*** [8.41]	-0.0003*** [3.30]	-0.0003*** [3.19]	-0.0011*** [7.62]	-0.0011*** [7.54]	0.0005*** [3.29]	0.0004*** [3.26]	0.0263 [2.15]	-0.0032** [2.01]	0.0002* [1.94]	0.0002* [0.72]
Observations	225	226	229	230	194	195	225	226	229	230	194	195
Number of country_id	27	28	27	28	25	26	27	28	27	28	25	26
R-squared	0.76	0.76	0.72	0.72	0.69	0.69	0.35	0.35	0.33	0.33	0.37	0.37

Absolute value of t statistics in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

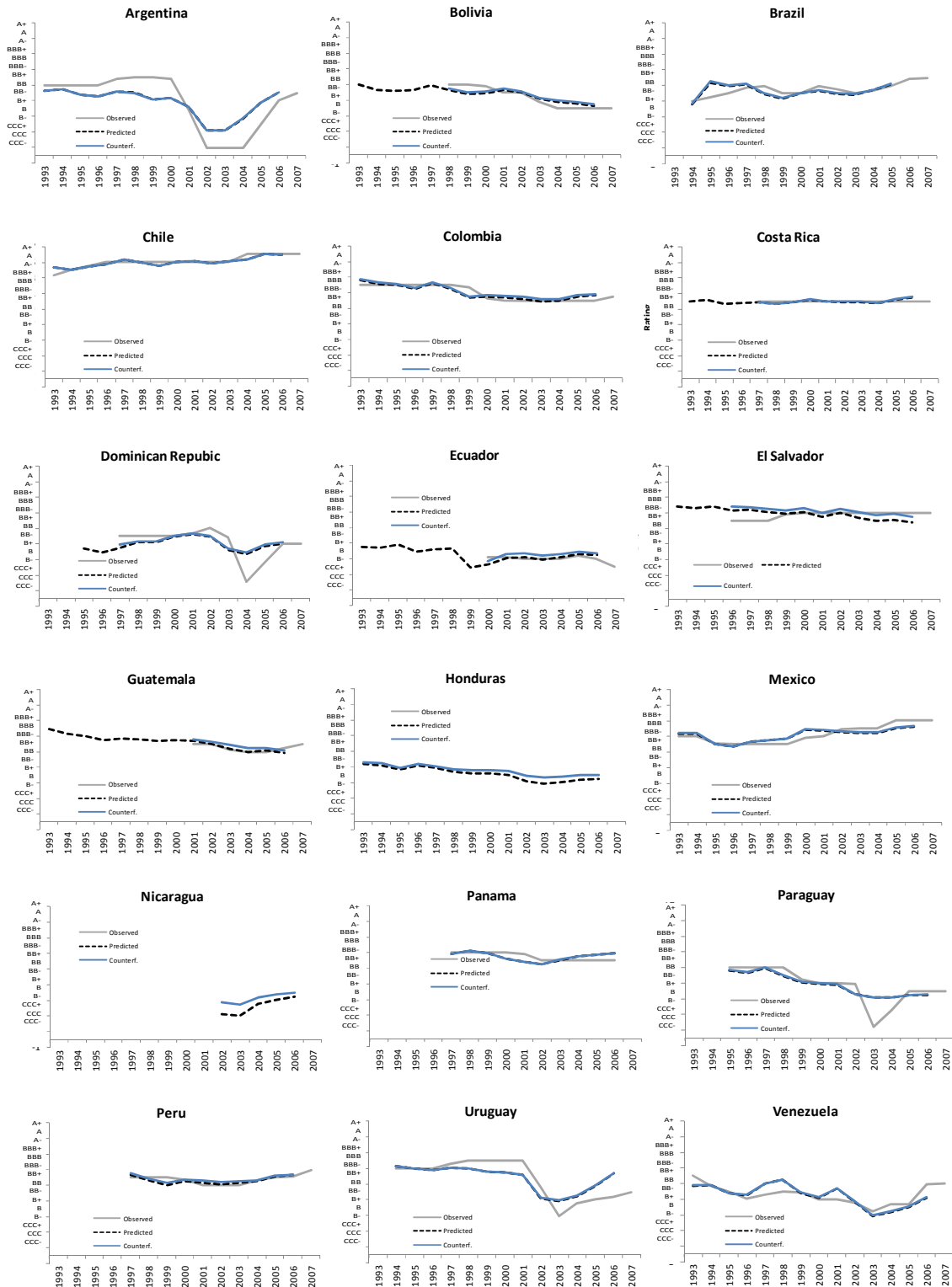
Source: Authors' calculation.

Annex 3 Volatility of Inward External Flows with and without Workers' Remittances



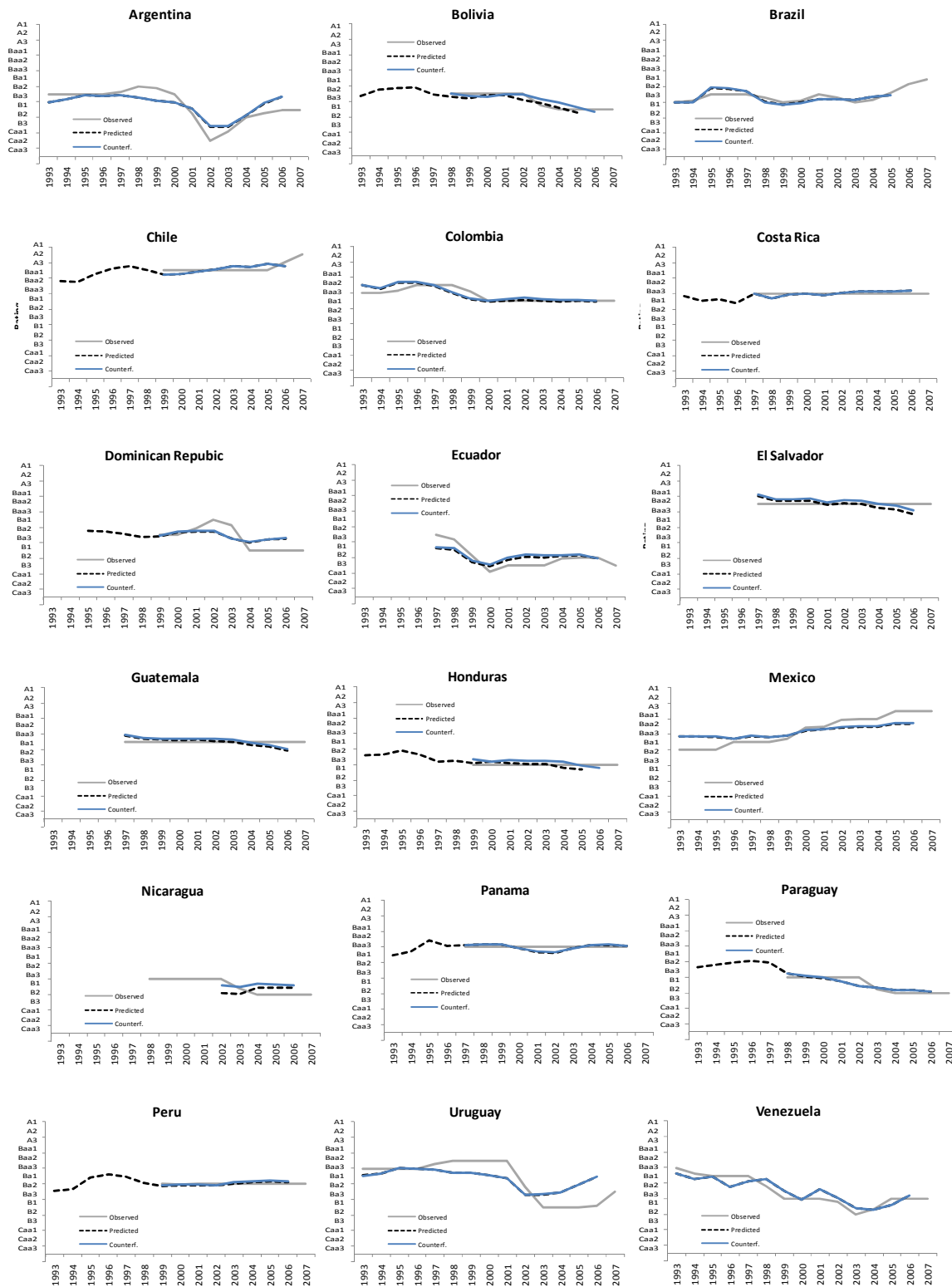
Source: Global Development Finance and International Financial Statistics, 2009.

Annex 4 Annex 4a. Counterfactual Analysis for Latin America – S&P



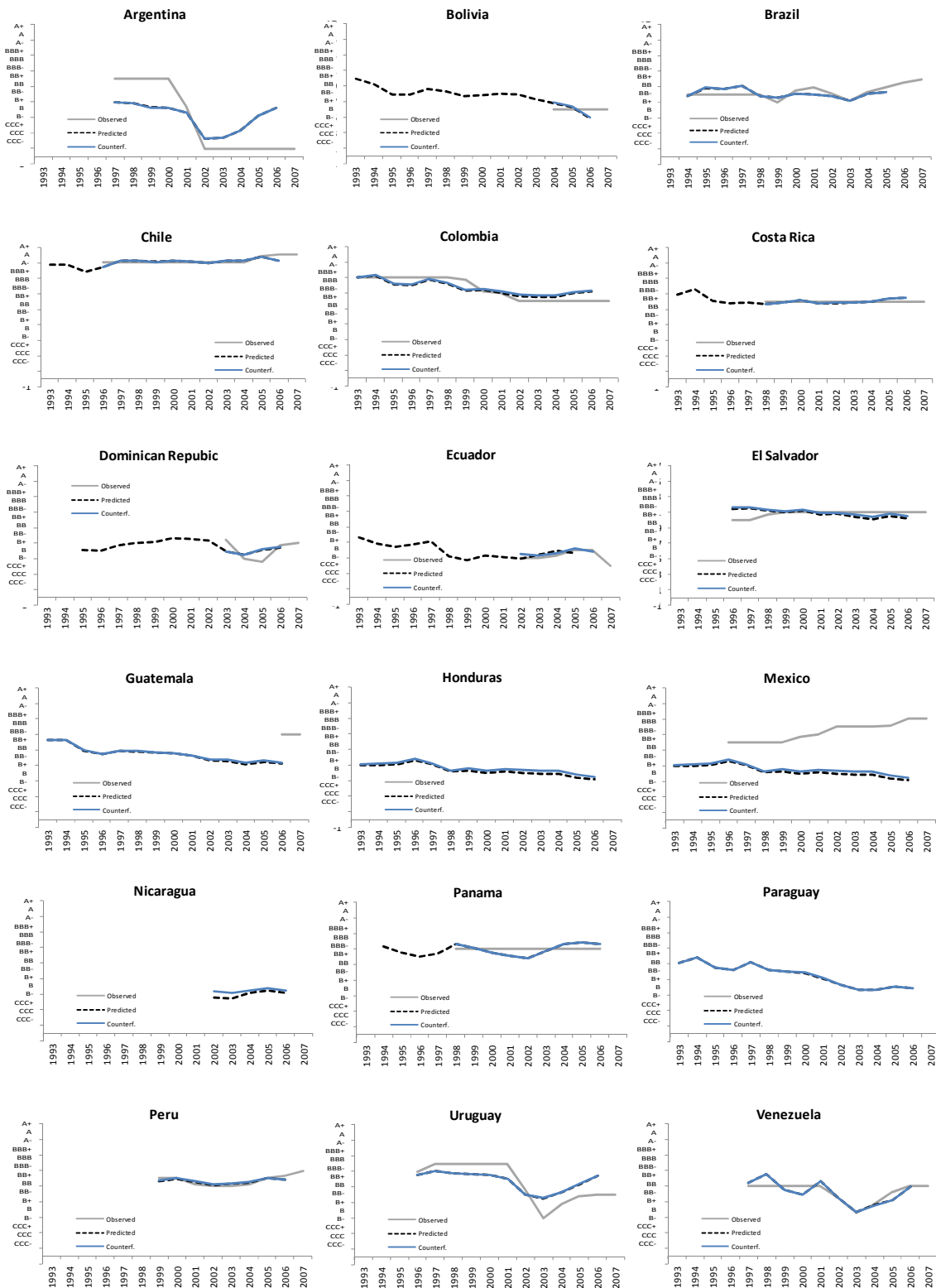
Source: Authors' calculation.

Annex 4 (cont.)
Annex 4b. Counterfactual Analysis for Latin America – Moody's



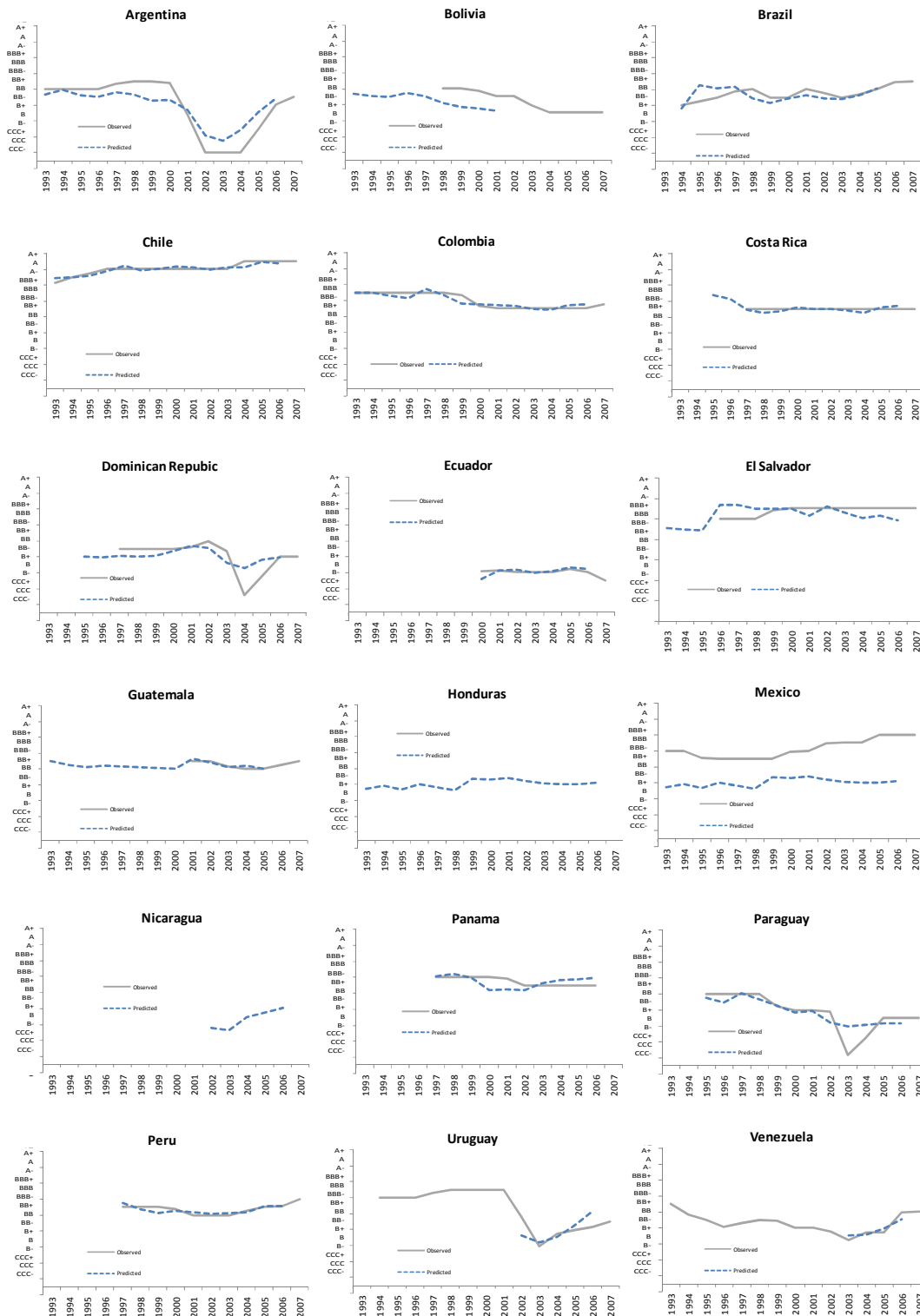
Source: Authors' calculation.

Annex 4 (cont.) Annex 4c. Counterfactual Analysis for Latin America – Fitch



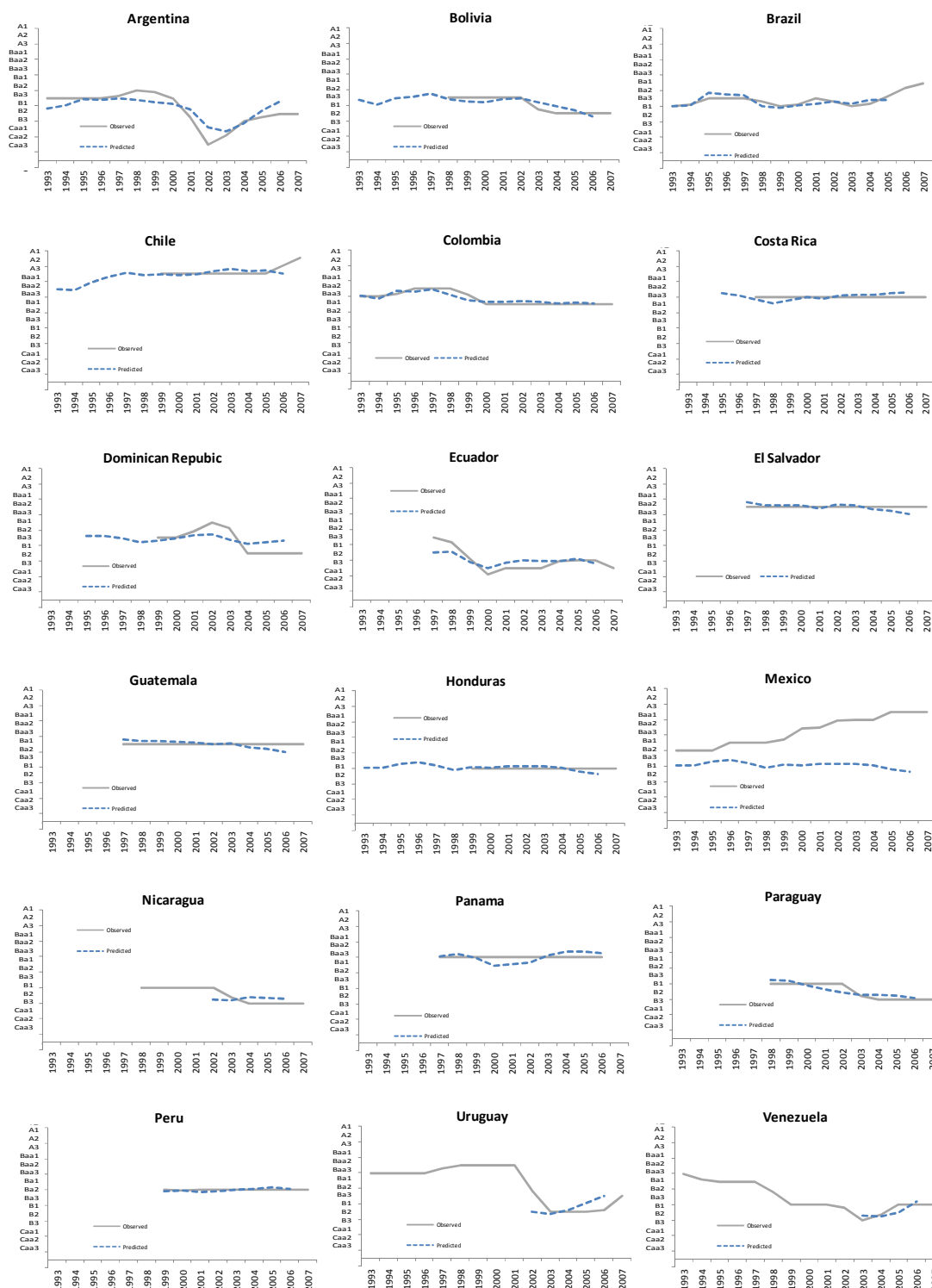
Source: Authors' calculation.

Annex 5 Annex 5a. Predicted vs. observed analysis for Latin America – S&P All



Source: Authors' calculation.

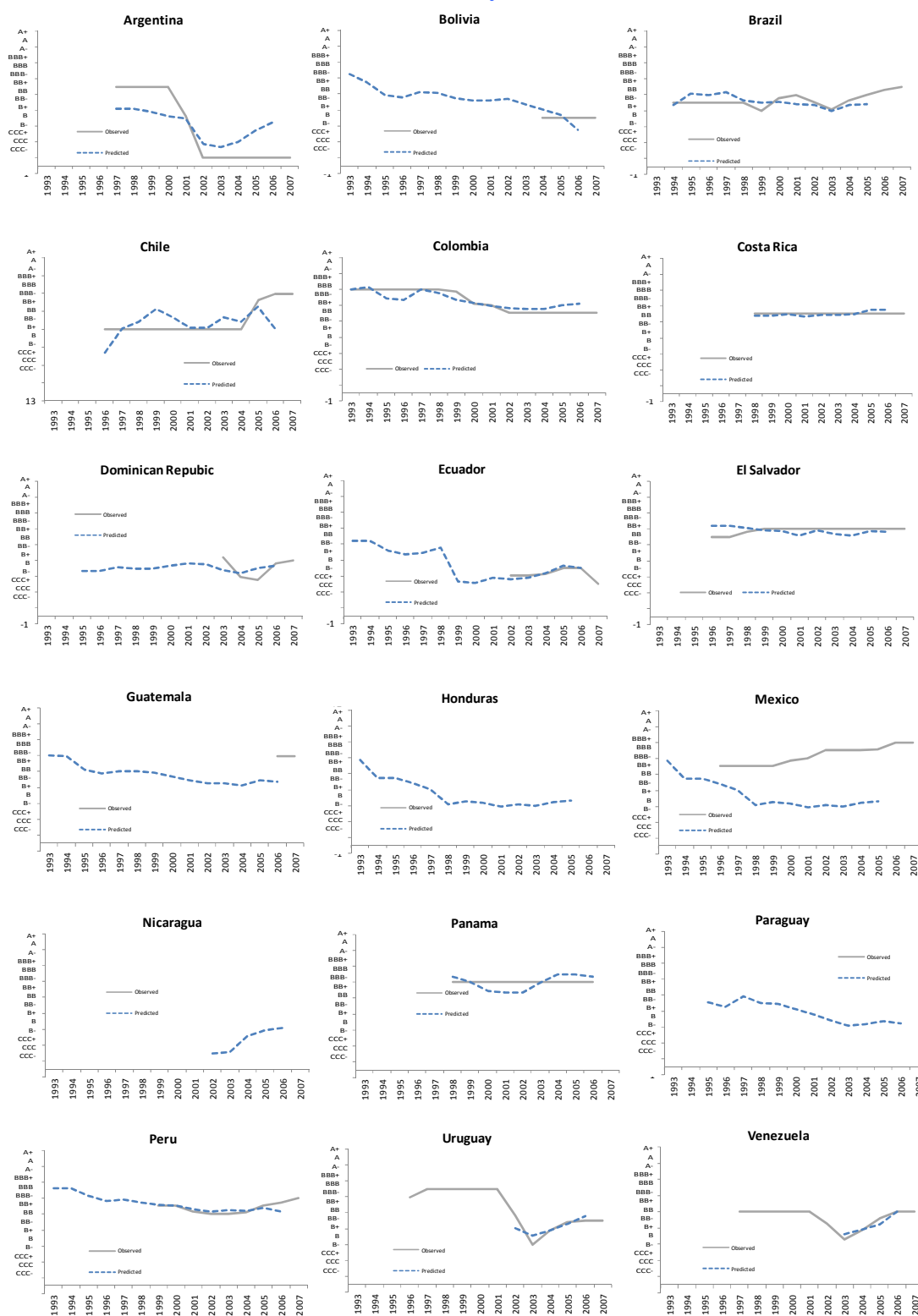
Annex 5 (cont.) Annex 5b. Predicted vs. observed analysis for Latin America – Moody's All



Source: Authors' calculation.

Annex 5 (cont.)

Annex 5c. Predicted vs. observed analysis for Latin America – Fitch All



Source: Authors' calculation.

Annex 6
Periods of covering shadow ratings for the model for High-Remittance Receptors

	S&P	Moody's	Fitch
Bolivia	1993:1997	1993:1997	1993:2003
Chile		1993:1998	
Costa Rica	1995:1996	1995:1996	
Dominican Rep.	1995:1996	1995:1998	1995:2002
Ecuador			1993:2001
El Salvador	1993:1995		
Guatemala	1993:2000		1993:2005
Honduras	1993:2006	1993:1998	1993:2006
Nicaragua	2002:2006		2002:2006
Paraguay			1995:2006
Peru			1993:1998

Source: Authors based on Fitch (2008a), Moody's (2008a) and S&P (2007).

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