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Sovereign Credit Ratings in Latin America and the Caribbean: History and Impact on Bond Spreads

ABSTRACT　In this study, we examine the history of sovereign credit ratings in Latin America and the Caribbean, the evolution of credit quality, and the relationship between rating changes and the cost of accessing external financing as reflected in the behavior of sovereign bond spreads. We apply an event study to estimate the impact of credit rating changes on sovereign bond spreads in the past fifteen years. We find that the impact is asymmetric (with a larger impact for downgrades) and is sensitive to both spatial and temporal clustering. The results suggest that the quality of sovereign credit is important in determining the cost of access to private external financing.

JEL Codes: G15, G14, F36, O54

Keywords: Sovereign credit ratings, Latin America and the Caribbean, country risk spreads, asymmetric effect

O ver the past fifteen years, one of the most significant trends in global financial markets has been the expanded access to international capital markets by countries that lacked access previously. Many studies focus on the role of sovereign credit ratings as a key determinant of a country's borrowing costs in international capital markets. Some studies find that sovereign credit ratings play a fundamental role in attracting capital inflows and investments, particularly to emerging market countries. More recent studies suggest that the increased participation of emerging market and developing countries in international financial markets has further enhanced the role of credit

ratings, turning such ratings into a critical metric for determining a country's borrowing terms in international capital markets. For example, a favorable rating could increase a developing country's ability to access foreign capital.

As a result of historically low domestic saving rates, access to external financing is crucial to countries in Latin America and the Caribbean. Also, the credit quality of the sovereigns in the region should play an important role in determining the cost of access to private external financing. In this paper, we examine the relationship between sovereign credit ratings and the cost of borrowing abroad for Latin American and Caribbean countries. We include all countries in the region that have received a credit rating from the three main credit rating agencies (CRAs)—Standard & Poor's, Moody's, and Fitch Ratings—and have had or gained access to international debt markets in recent years.

The literature increasingly recognizes that other factors besides country-related fundamentals could explain bond spreads in emerging market countries. Although numerous studies examine country categories, such as emerging/developing and developed markets or high-income and low-income countries, few studies take a regional (geographic) perspective. To our knowledge, the studies with a regional approach are focused, for the most part, on samples of countries, which usually include only the largest regional economies.

This paper's contribution to the literature is to bring a broader regional focus to the analysis of sovereign credit ratings and their impact on bond spreads. It examines historical trends and whether the results and conclusions found in the literature hold for the Latin American and Caribbean region when smaller countries, which are not as well integrated with international financial markets as the largest economies, are also included in the analysis. For this purpose, we assembled a data set comprising all Latin American and Caribbean countries that have received a credit rating.

We then apply an event study to estimate the impact (direction and magnitude) of credit rating changes on sovereign bond spreads, as measured by the J.P. Morgan Emerging Market Bond Index Global (EMBIG). For the empirical model, we use data for the past fifteen years, when access to international bond markets expanded and more countries from the region were added to the EMBIG index. More than half (56 percent) of all credit rating changes in the region took place during this period. We also perform spatial and temporal analyses, to better understand the dynamics within the region during this period.

Our findings show that the impact of credit rating changes on sovereign bond spreads is asymmetric, with downgrades having a larger impact than upgrades, a result that is consistent with the literature. However, the impact is sensitive to spatial and temporal clustering, depending on the subregion

and the period. The results suggest that the quality of sovereign credit has an essential role in determining the cost of access to private external financing for Latin American and Caribbean countries.

The paper is structured as follows. The next section presents a brief review of the literature on sovereign credit ratings and their impact on bond spreads. We then describe the data set and historical trends in the Latin American and Caribbean region and subregions, looking at the evolution of sovereign credit ratings. We subsequently examine the impact of sovereign credit rating changes on the countries' cost of borrowing abroad, measured by EMBIG spreads. The final section offers concluding remarks.

Literature Review

Sovereign credit ratings are particularly important for economies whose access to international capital markets oscillates over time, as in the case of emerging market countries. They have facilitated an increase of emerging economies' access to international capital markets and enhanced their ability to raise funds at a lower cost. While sovereign credit ratings summarize available evidence on the state of the economy, changes in ratings (such as upgrades and downgrades) often trigger a market response, likely due to investors revising their expectations.[1] Thus, because of the nature of sovereign ratings as "facilitators" to emerging countries' access to international capital markets and their influence on market decisions, capital flows tend to respond to rating changes. For example, sovereign credit rating downgrades are frequently associated with outflows of capital from the country being downgraded. Flows around downgrades are generally consistent with a flight-to-quality phenomenon. Moreover, when there is a price response to the credit rating action, additional flows (outflows) may take place.

The literature on sovereign credit ratings can be broadly divided into two main areas.[2] The first focuses on the fundamentals explaining the determinants and variations in ratings.[3] The second area centers on rating actions and their impact on sovereign yield spreads.[4] This paper builds on the literature of the

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1. Gande and Parsley (2004).
2. Luitel, Vanpée, and De Moor (2016).
3. See, for example, Feder and Uy (1985); Cantor and Packer (1996); Ul Haque, Mark, and Mathieson (1998); Ferri, Liu, and Stiglitz (1999); and Afonso, Furceri, and Gomes (2012).
4. See, for example, Cantor and Packer (1996); Reisen and von Maltzan (1999); Sy (2001); Kräussl (2003); Hull, Predescu, and White (2004); Gande and Parsley (2004); Gaillard (2009); and Broto and Molina (2014).

second area by bringing a regional focus and concentrating the analysis on the entire Latin American and Caribbean region, including the smaller and less integrated economies, some of which only recently gained access to international capital markets. Other papers focus on country categories, such as emerging or developing countries versus developed economies.[5] Papers that do take a regional approach tend to focus on samples of countries, which usually include only the largest economies of a region, and not on the entire region.[6]

We implement an event study to analyze whether there is a statistically significant impact on Latin American and Caribbean bond spreads from credit rating changes, which are hypothesized to affect the countries' borrowing costs and ability to access foreign capital. Studies on the impact of credit ratings on financial variables are part of a vast field, within which several authors use event studies or look at the impact of credit ratings on sovereign bond spreads.

In their seminal 1996 paper, Cantor and Packer address the important question of how much impact credit ratings may have on sovereign borrowing costs.[7] Their methodology includes a cross-section data set and different econometric tools (namely, regressions and event study), which are applied to just one day (September 29, 1995). They find that rating announcements have immediate effects on market pricing for non-investment-grade bonds.

Sy runs panel regressions for seventeen emerging countries to estimate the relation between sovereign risk and a set of independent variables (including credit ratings, a measure of currency risk, and liquidity conditions), using monthly data from January 1994 to April 2001.[8] He emphasizes that market views are represented by bond spreads, while economic fundamentals are captured by ratings.[9] He finds a negative relationship between sovereign spreads and ratings, with higher ratings being associated with lower spreads, an interrelation that strengthens over the years.

Kräussl analyzes the role of credit rating agencies in international financial markets, particularly whether sovereign credit ratings have an impact on financial stability in emerging economies.[10] His null hypothesis is that CRAs

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5. For example, Kişla and Önder (2018); Yalta and Yalta (2018); Montes, de Oliveira, and de Mendonça (2016); Luitel, Vanpée, and De Moor (2016); Erdem and Varli (2014).

6. For example, Ballester and González-Urteaga (2017).

7. Cantor and Packer (1996).

8. Sy (2001).

9. Cavallo, Powell, and Rigobon (2008), however, remark that spreads and ratings are both measures of the same, but not observed, fundamentals.

10. Kräussl (2003).

add value. To perform the study, he defines a Speculative Market Index (SMI), which he uses as a dependent variable in a panel regression. The author also carried out an event study with daily data from January 1, 1997, to December 31, 2000. The paper finds that CRAs have substantial influence on the size and volatility of emerging market lending. Moreover, the conclusions are significantly stronger in the case of sovereign downgrades and imminent negative sovereign credit rating actions (such as credit watches and rating outlooks) than in the case of positive adjustments.

Hull, Predescu, and White use an event study framework to analyze the impact of ratings on credit default swaps (CDSs) and bond yields with daily data between January 5, 1998, and May 24, 2002.[11] Specifically, the authors test the extent to which participants in the CDS market anticipate credit rating announcements by Moody's. The authors find that CDS spread changes tend to anticipate negative rating announcements, particularly when extreme declines in credit quality happen within a short period of time. The results were much less significant for positive rating events than for negative rating events.

Gaillard analyzes the correlation between EMBIG spreads and the credit ratings of the three main CRAs, using monthly data for the period from December 1993 to February 2007.[12] The estimation uses a univariate model of EMBIG spreads with an unbalanced panel data estimation of log spreads on Fitch, Moody's, and Standard & Poor's ratings. Focusing on the specific relationship between the market and each agency, the author concludes that for the three CRAs, there was an asymmetric adjustment of ratings: the CRAs were more prone to downgrade following excessively high spreads and spread increases than they were to upgrade following excessively low spreads and spread decreases.

Broto and Molina also find that sovereign ratings tend to follow an asymmetric path.[13] Defining the evolution of a country's credit rating during consecutive downgrade and upgrade periods as a rating cycle and using panel data to analyze the main determinants of ratings during downgrade and upgrade periods, the authors find that CRAs overreact in downgrading sovereign ratings during times of economic crisis and instability and, conversely, underreact when upgrading during calmer times.

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11. Hull, Predescu, and White (2004). A sovereign's or corporate's credit default swap spread is the cost per year for protection against a default.

12. Gaillard (2009).

13. Broto and Molina (2014).

Our contribution to the literature is to focus on the entire Latin American and Caribbean region. We start with an analysis of the evolution of credit-worthiness in the region, bringing together a historical data set that includes all countries in the region that have received a credit rating (twenty-seven in total), covering more than fifty years of data. We then use an empirical model (event study) to examine the impact of sovereign ratings on the cost of borrowing abroad, including seventeen countries for which data on both credit rating changes and daily bond spreads are available. The focus, however, is on the past fifteen years to include the countries that gained access to international debt markets during this period.[14]

Because the literature shows that a significant part of sovereign bond spreads is explained by common factors, such as investors' appetite for risk and global economic trends, our empirical model also includes the estimation of normal returns through capital asset pricing model (CAPM) regressions, controlling sovereign credit risk by its sensitivity to global market risk. The econometric estimation of CAPM regressions was performed for each of the rating change events.

Historical Data Set

The 1990s witnessed a sharp increase in the number of rated sovereigns from Latin America and the Caribbean as a growing number of governments began tapping global bond markets. By the end of the decade, twenty-five countries were rated, as opposed to only four in 1990 (namely, Argentina, Brazil, and Mexico, rated by Moody's, and Venezuela, rated by Moody's and Standard & Poor's). By the end of 2017, twenty-six sovereign issuers were rated (figure 1). The number of rated sovereign issuers peaked at twenty-seven in 2007, but in October 2014 Standard & Poor's removed Grenada's rating, bringing the number to twenty-six. Being rated by CRAs is an important step to increase access and exposure to a wider range of international investors.

For this study, we assembled a data set that brings together the history of Latin American and Caribbean sovereign ratings in the post–World War II period—from when they were first assigned to December 2017—based on information from the three main CRAs, namely, Standard & Poor's, Moody's,

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14. Some of those countries were not previously included in the EMBIG because of their lack of access, but they were added during this fifteen-year period.

F I G U R E 1 . Latin America and the Caribbean: Number of Rated Sovereigns
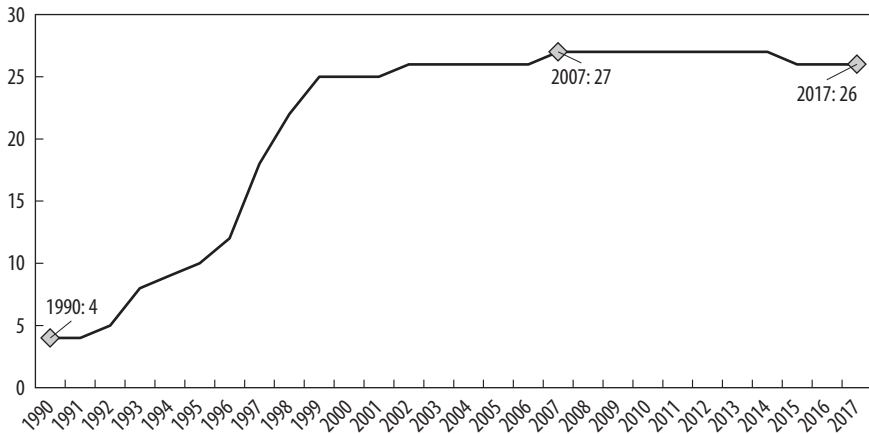
Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.

and Fitch Ratings. Most of the countries of the region received their initial ratings in the 1990s, with a few having been rated earlier, while the latest rating assessment for this paper is the credit rating that was current as of December 31, 2017.[15]

To look at the evolution of these credit ratings and to compare the behavior by CRA, we converted the sovereign credit ratings to numerical values (table 1). Together, the three leading CRAs currently rate twenty-six countries in the region (figure 1, table 2).[16] Some countries had a significant difference between their best and worst credit rating assessments (table 3), including Venezuela (in the case of Standard & Poor's), Barbados (in the

15. The history of sovereign credit ratings in the region, which starts when a sovereign rating is assigned, was first assembled by Bustillo and Velloso (2013, table VI.1, pp. 95–103) and was updated to December 2017 for the purposes of this paper.

16. According to the information we compiled, the first sovereign to have been assigned a foreign currency credit rating was Panama: Moody's assigned it a new A rating on June 30, 1958, which was then withdrawn on October 14, 1977. On June 27, 1978, the rating was reinstated and upgraded to Aa, but it was withdrawn again on November 11, 1985. A new Ba1 rating was assigned on January 22, 1997. The other sovereign receiving an early rating was Venezuela, which was assigned a new Aaa rating by Moody's on December 29, 1976. The rating was downgraded to Aa on February 4, 1983, and withdrawn on March 25, 1983. A new Ba2 rating was assigned on June 3, 1987. In table 2 and the following tables and charts in this section, we take as the initial assessment the rating acquired in January 1997, in the case of Panama, and in June 1987, in the case of Venezuela.

TABLE 1. Credit Rating Scale

Category	Standard & Poor's		Moody's		Fitch	
	Rating	Score	Rating	Score	Rating	Score
Upper investment grade	AAA	22	Aaa	22	AAA	22
	AA+	21	Aa1	21	AA+	21
	AA	20	Aa2	20	AA	20
	AA−	19	Aa3	19	AA−	19
	A+	18	A1	18	A+	18
	A	17	A2	17	A	17
	A−	16	A3	16	A−	16
Lower investment grade	BBB+	15	Baa1	15	BBB+	15
	BBB	14	Baa2	14	BBB	14
	BBB−	13	Baa3	13	BBB−	13
Non-investment grade	BB+	12	Ba1	12	BB+	12
	BB	11	Ba2	11	BB	11
	BB−	10	Ba3	10	BB−	10
Lower non-investment grade	B+	9	B1	9	B+	9
	B	8	B2	8	B	8
	B−	7	B3	7	B−	7
	CCC+	6	Caa1	6	CCC+	6
	CCC	5	Caa2	5	CCC	5
	CCC−	4	Caa3	4	CCC−	4
	CC	3	Ca	3	CC	3
	C	2	C	2	C	2
Default	SD	1		1	RD	1
	D	0		0	D	0

Source: Authors' elaboration, based on credit ratings by Standard & Poor's, Moody's, and Fitch rating services.

case of Moody's), and Uruguay (in the case of Fitch). For many countries in the sample, their worst assessment was a default rating. Eleven countries in the region—Argentina, Barbados, Belize, Dominican Republic, Ecuador, El Salvador, Grenada, Jamaica, Paraguay, Uruguay, and Venezuela—received at least one default rating, or a rating below Caa3 in the case of Moody's, during the period of analysis.

The credit rating data set for Latin America and the Caribbean, as of December 31, 2017, contained 504 credit rating changes. Downgrades (262) outpaced upgrades (242). Standard & Poor's accounted for the highest number of changes (230), followed by Moody's (155) and Fitch (119). The number of downgrades exceeded the number of upgrades for Standard & Poor's, but in the case of Moody's and Fitch, upgrades outpaced downgrades (table 4). More than half of these credit rating changes (56 percent), and 64 percent of the total number of upgrades and 48 percent of the downgrades, took place in 2003–17.

Data by Agency

At the agency level, the data show that overall, Standard & Poor's rated the highest number of sovereigns among the three agencies and had the largest gap between top and bottom assessments. Moody's had the smallest gap between the averages for best (Ba1) and worst (B2) assessments.

In the case of Standard & Poor's, credit ratings improved for thirteen sovereigns in the analyzed period, deteriorated for nine, and remained the same for three. Venezuela had the highest difference between the top and the bottom rating (twenty-one notches), followed by Uruguay (thirteen notches) and El Salvador (eleven notches). The countries that received the lowest ratings were the ones that defaulted on their debt obligations at some point during the period under study (ten out of twenty-seven rated countries, or 37 percent of all rated sovereigns), even if only for a short period. In the case of Standard & Poor's, this list includes Argentina, Belize, the Dominican Republic, Ecuador, El Salvador, Grenada, Jamaica, Paraguay, Uruguay, and Venezuela (figure 2).

The average of the worst assessments by Standard & Poor's for the region was a CCC+, in the lower non-investment-grade category, indicated by the dashed line in figure 2. The average for the best assessments was a BBB−, in the lower-investment-grade category. On average, the difference between the top and bottom ratings was seven notches.

In the case of Moody's, credit ratings improved for twelve sovereigns, deteriorated for twelve, and remained the same for two. Barbados had the highest difference between the top and the bottom rating (ten notches), followed by Belize, Peru, and Venezuela (eight notches). The countries that received the lowest ratings from Moody's were Argentina, Belize, and Ecuador, followed by Barbados, Jamaica, and Venezuela (figure 3).

The average of the worst assessments by Moody's for the region was a B2, in the lower non-investment-grade category, shown as the dashed line in figure 3, which was two notches higher than the Standard & Poor's average. The average for the best assessments was a Ba1, still in the non-investment-grade category and one notch lower than the Standard & Poor's average. The difference between the top and bottom ratings was five notches, on average, versus seven for Standard & Poor's.

In the case of Fitch, credit ratings improved for ten sovereigns, deteriorated for six, and remained the same for three. Uruguay had the highest difference between the top and the bottom rating (thirteen notches), followed by Argentina (eleven notches) and the Dominican Republic (ten notches). The countries that received the lowest ratings were the ones that at some point

TABLE 2. Credit Rating History in Latin America and the Caribbean: Initial and Latest Credit Rating as of December 31, 2017

	Standard & Poor's				Moody's				Fitch			
	Initial rating		Latest rating		Initial rating		Latest rating		Initial rating		Latest rating	
Country	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
Argentina	25 Aug 93	BB–	30 Oct 17	B+	18 Nov 86	Ba3	29 Nov 17	B2	28 May 97	BB	10 May 16	B
Bahamas	3 Dec 03	A–	20 Dec 16	BB+	24 Jan 97	A3	22 Aug 16	Baa3	...	...	...	...
Barbados	17 Dec 99	A–	3 Mar 17	CCC+	5 Dec 94	Ba2	9 Mar 17	Caa3	...	...	...	...
Belize	18 Aug 00	BB	23 Mar 17	B–	21 Jan 99	Ba2	11 Apr 17	B3	...	...	...	...
Bolivia	6 Jul 98	BB–	15 May 14	BB	29 May 98	B1	8 Jun 12	Ba3	17 Mar 04	B–	13 Jul 16	BB–
Brazil	1 Dec 94	B	17 Feb 16	BB	18 Nov 86	Ba1	24 Feb 16	Ba2	1 Dec 94	B+	5 May 16	BB
Chile	17 Aug 92	BBB	13 Jul 17	A+	17 Feb 94	Baa2	16 Jun 10	Aa3	10 Nov 94	BBB+	11 Aug 17	A
Colombia	21 Jun 93	BBB–	11 Dec 17	BBB–	4 Aug 93	Ba1	28 Jul 14	Baa2	10 Aug 94	BBB	10 Dec 13	BBB
Costa Rica	16 Jul 97	BB	25 Feb 16	BB–	8 May 97	Ba1	8 Feb 17	Ba2	11 May 98	BB	19 Jan 17	BB
Cuba	...	...	...	...	5 Apr 99	Caa1	23 Apr 14	Caa2	...	...	...	...
Dominican Republic	13 Feb 97	B+	20 May 15	BB–	30 May 97	B1	20 Jul 17	Ba3	11 Aug 03	B+	18 Nov 16	BB–
Ecuador	29 Jul 00	SD	29 Jun 17	B–	24 Jul 97	B1	19 Dec 14	B3	8 Nov 02	CCC+	18 Oct 13	B
El Salvador	26 Aug 96	BB	3 Oct 17	CCC+	7 Jul 97	Baa3	13 Apr 17	Caa1	23 Sep 96	BB	6 Oct 17	B–
Grenada[a]	22 Mar 02	BB–	12 Mar 13	SD	...	...	...	...	...	...	...	...
Guatemala	18 Oct 01	BB	18 Oct 17	BB–	8 Jul 97	Ba2	1 Jun 10	Ba1	22 Feb 06	BB+	20 Jun 14	BB
Honduras	8 Oct 08	B+	18 Jul 17	BB–	29 Sep 98	B2	22 Sep 17	B1	...	...	...	...

Country												
Jamaica	9 Nov 99	B	3 Jun 15	B	30 Mar 98	Ba3	21 Nov 16	B3	29 Aug 06	B+	11 Feb 16	B
Mexico	30 Jul 92	BB+	19 Dec 13	BBB+	18 Dec 90	Ba2	5 Feb 14	A3	30 Aug 95	BB	8 May 13	BBB+
Nicaragua	11 Feb 16	B+	…	…	27 Mar 98	B2	10 Jul 15	B2	16 Dec 15	B+	…	…
Panama[a]	22 Jan 97	BB+	2 Jul 12	BBB	22 Jan 97	Ba1	31 Oct 12	Baa2	8 Sep 98	BB+	2 Jun 11	BBB
Paraguay	23 Oct 95	BB-	11 Jun 14	BB	13 Jul 98	B2	20 Mar 15	Ba1	10 Jan 13	BB-	29 Jan 15	BB
Peru	18 Dec 97	BB	19 Aug 13	BBB+	5 Feb 96	B2	2 Jul 14	A3	14 Oct 99	BB	23 Oct 13	BBB+
St. Vincent and the Grenadines	…	…	…	…	10 Dec 07	B1	21 Nov 14	B3	…	…	…	…
Suriname	17 Nov 99	B-	26 Apr 17	B	3 Feb 04	B1	20 May 16	B1	18 Jun 04	B	22 Feb 17	B-
Trinidad and Tobago	14 Mar 96	BB+	21 Apr 17	BBB+	8 Feb 93	Ba2	25 Apr 17	Ba1	…	…	…	…
Uruguay	14 Feb 94	BB+	5 Jun 15	BBB	15 Oct 93	Ba1	29 May 14	Baa2	18 Jan 95	BB+	7 Mar 13	BBB-
Venezuela	5 Oct 77	AAA	13 Nov 17	SD	3 Jun 87	Ba2	13 Jan 15	Caa3	15 Sep 97	BB-	14 Nov 17	RD

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.

Notes: a. In the case of Grenada, Standard & Poor's removed its sovereign rating on October 31, 2014. As of December 31, 2017, Grenada was not rated (NR) by any of the credit rating agencies. Ellipses (…) indicate not available.

T A B L E 3 . Credit Rating History in Latin America and the Caribbean: Best and Worst Credit Ratings, by Country and Agency

Country	Standard & Poor's				Moody's				Fitch			
	Best rating		Worst rating		Best rating		Worst rating		Best rating		Worst rating	
	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value
Argentina	2 Apr 97	BB	6 Nov 01, 30 Jul 14	SD	18 Nov 86, 2 Oct 97	Ba3	21 Dec 01	Ca	28 May 97	BB	3 Dec 01	D
Bahamas	3 Dec 03	A−	20 Dec 16	BB+	24 Jan 97	A3	22 Aug 16	Baa3	…	…	…	…
Barbados	17 dic 99	A−	3 Mar 17	CCC+	8 Feb 00	Baa2	9 Mar 17	Caa3	…	…	…	…
Belize	18 Aug 00	BB	7 Dec 06, 21 Aug 12, 20 Mar 17	SD	21 Jan 99	Ba2	1 Jun 12	Ca	…	…	…	…
Bolivia	15 May 14	BB	20 Oct 03	B−	8 Jun 12	Ba3	16 Apr 03	B3	15 Jul 15	BB	17 Mar 04	B−
Brazil	17 Nov 11	BBB	1 Dec 94	B	20 Jun 11	Baa2	31 Mar 89, 3 Sep 98, 12 Aug 02	B2	04 Apr 11	BBB	26 Jan 99, 21 Oct 02	B−
Chile	26 Dec 12	AA−	17 Aug 92	BBB	16 Jun 10	Aa3	17 Feb 94	Baa2	01 Feb 11	A+	10 Nov 94	BBB+
Colombia	24 Apr 13	BBB	24 May 00	BB	28 Jul 14	Baa2	11 Aug 99	Ba2	10 Aug 94, 10 Dec 13	BBB	10 Jan 02	BB
Costa Rica	16 Jul 97	BB	25 Feb 16	BB−	9 Sep 10	Baa3	8 Feb 17	Ba2	04 Mar 11	BB+	11 May 98, 19 Jan 17	BB
Cuba	…	…	…	…	5 Apr 99	Caa1	23 Apr 14	Caa2	…	…	…	…
Dominican Republic	5 Sep 01, 20 May 15	BB−	1 Feb 05	SD	29 Aug 01	Ba2	30 Jan 04	B3	18 Nov 16	BB−	5 May 05	D
Ecuador	20 Aug 14	B+	29 Jul 00, 15 Dec 08	SD	24 Jul 97	B1	16 Dec 08	Ca	18 Oct 13	B	16 Dec 08	RD
El Salvador	29 Apr 99	BB+	20 Apr 17, 2 Oct 17	SD	7 Jul 97	Baa3	13 Apr 17	Caa1	05 May 98	BB+	10 Apr 17	CCC

| Country												
Grenada	22 Mar 02	BB–	12 Mar 13	SD	…	…	…	…	…	…	…	BB
Guatemala	18 Oct 01, 17 Jul 06	BB	9 May 03, 18 Oct 17	BB–	1 Jun 10	Ba1	8 Jul 97	Ba2	22 Feb 06	BB+	20 Jun 14	BB
Honduras	18 Jul 17	BB–	11 Sep 09, 7 Aug 13	B	22 Sep 17	B1	27 Feb 14	B3	…	…	…	…
Jamaica	2 May 01	B+	14 Jan 10, 12 Feb 13	SD	30 Mar 98	Ba3	6 Mar 13	Caa3	29 Aug 06	B+	3 Feb 10, 22 Feb 13	RD
Mexico	8 Oct 07, 19 Dec 13	BBB+	10 Feb 95	BB	5 Feb 14	A3	18 Dec 90	Ba2	19 Sep 07, 8 May 13	BBB+	30 Aug 95	BB
Nicaragua	11 Feb 16	B+	11 Feb 16	B+	27 Mar 98, 10 Jul 15	B2	30 Jun 03	Caa1	16 Dec 15	B+	16 Dec 15	B+
Panama	2 Jul 12	BBB	20 Nov 01	BB	31 Oct 12	Baa2	22 Jan 97	Ba1	2 Jun 11	BBB	8 Sep 98	BB+
Paraguay	11 Jun 14	BB	13 Feb 03	SD	20 Mar 15	Ba1	28 Apr 03	Caa1	10 Jan 13	BB–	29 Jan 15	BB
Peru	19 Aug 13	BBB+	31 Oct 00	BB–	2 MONTH 14	A3	5 Feb 96	B2	23 Oct 13	BBB+	14 Oct 99	BB
St. Vincent and the Grenadines	…	…	…	…	10 dic 07	B1	21 Nov 14	B3	…	…	…	…
Suriname	19 Aug 11	BB–	17 Nov 99	B–	14 Aug 12	Ba3	3 Feb 14, 20 May 16	B1	10 Jul 12	BB–	22 Feb 17	B–
Trinidad and Tobago	15 Aug 08	A	14 Mar 96	BB+	13 Jul 06	Baa1	8 Feb 93	Ba2	…	…	…	…
Uruguay	5 Jun 15	BBB	16 May 03	SD	29 May 14	Baa2	31 Jul 02	B3	7 Mar 13	BBB–	17 Jun 03	D
Venezuela	5 Oct 77	AAA	18 Jan 05, 13 Nov 17	SD	7 Aug 91	Ba1	13 Jan 15	Caa3	15 Sep 97, 14 Nov 05	BB–	14 Nov 17	RD

T A B L E 4. Credit Rating History in Latin America and the Caribbean: Number of Credit Rating Actions, by Country and Agency

Country	Standard & Poor's			Moody's			Fitch			All agencies		
	Upgrades	Downgrades	Total	Upgrades	Downgrades	Total	Upgrades	Downgrades	Total	Upgrades	Downgrades	Total
Argentina	8	13	21	6	8	14	2	9	11	16	30	46
Bahamas	0	4	4	0	3	3	…	…	…	0	7	7
Barbados	0	7	7	2	6	8	…	…	…	2	13	15
Belize	3	16	19	4	6	10	…	…	…	7	22	29
Bolivia	4	3	7	3	1	4	4	1	5	11	5	16
Brazil	8	5	13	8	6	14	8	6	14	24	17	41
Chile	5	1	6	4	0	4	3	1	4	12	2	14
Colombia	3	3	6	4	1	5	3	3	6	10	7	17
Costa Rica	0	1	1	1	2	3	1	1	2	2	4	6
Cuba	…	…	…	0	1	1	…	…	…	0	1	1
Dominican Republic	5	6	11	4	3	7	4	4	8	13	13	26
Ecuador	7	7	14	7	5	12	4	2	6	18	14	32
El Salvador	3	8	11	0	6	6	2	5	7	5	19	24
Grenada	3	6	9	…	…	…	…	…	…	3	6	9
Guatemala	1	2	3	1	0	1	0	1	1	2	3	5
Honduras	2	5	7	2	1	3	…	…	…	4	6	10
Jamaica	5	6	11	3	4	7	4	5	9	12	15	27
Mexico	5	2	7	5	0	5	5	1	6	15	3	18
Nicaragua	0	0	0	2	1	3	0	0	0	2	1	3
Panama	3	1	4	2	0	2	2	0	2	7	1	8
Paraguay	5	4	9	5	1	6	1	0	1	11	5	16
Peru	5	1	6	6	0	6	5	1	6	16	2	18
St. Vincent and the Grenadines	…	…	…	0	2	2	…	…	…	0	2	2
Suriname	3	2	5	1	1	2	2	2	4	6	5	11
Trinidad and Tobago	5	2	7	4	3	7	…	…	…	9	5	14
Uruguay	9	7	16	6	3	9	8	7	15	23	17	40
Venezuela	7	19	26	2	9	11	3	9	12	12	37	49
Total	99	131	230	82	73	155	61	58	119	242	262	504

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.
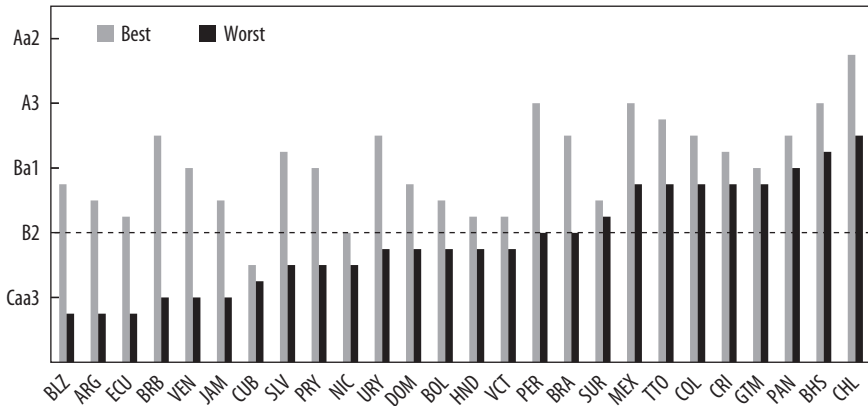Note: Ellipses (…) indicate not applicable.

F I G U R E   2 .   Standard & Poor's: Best and Worst Credit Rating Assessments in Latin America and the Caribbean
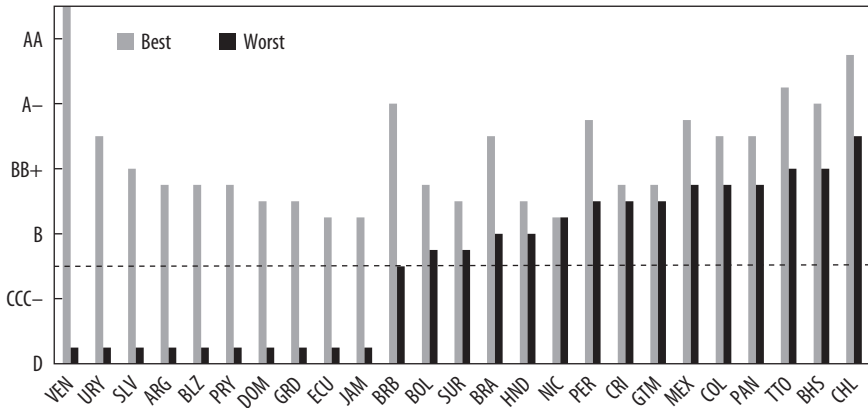
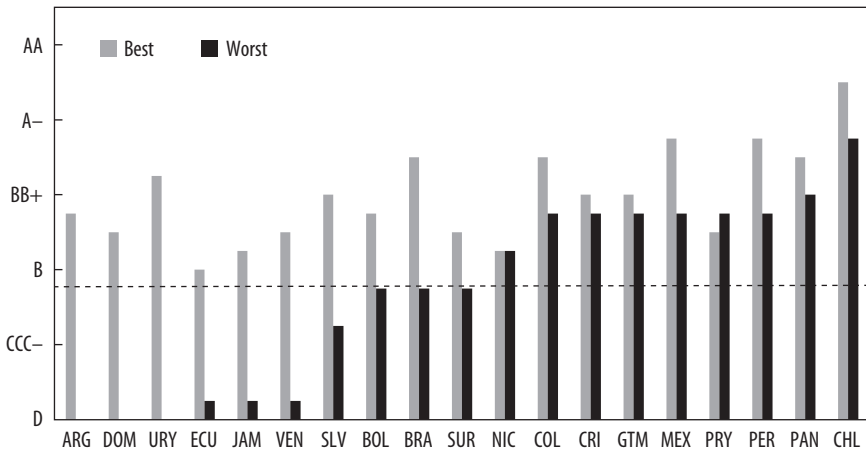Source: Authors' elaboration, based on data from Standard & Poor's.

Notes: The latest rating assessment included in the figure is December 2017. The horizontal dashed line represents the average of Standard & Poor's worst credit rating assessments of all countries in the region for the period analyzed (namely, a CCC+ rating). In the case of Grenada, Standard & Poor's removed its sovereign rating on October 31, 2014; Grenada thus is currently not rated (NR) by any of the credit rating agencies.

F I G U R E   3 .   Moody's: Best and Worst Credit Rating Assessments in Latin America and the Caribbean

Source: Authors' elaboration, based on data from Moody's.

Note: The horizontal dashed line represents the average of Moody's worst credit rating assessments of all countries in the region for the period analyzed (namely, a B2 rating).

FIGURE 4. Fitch: Best and Worst Credit Rating Assessments in Latin America and the Caribbean

Source: Authors' elaboration, based on data from Fitch.

Note: The horizontal dashed line represents the average of Fitch's worst credit rating assessments of all countries in the region for the period analyzed (namely, a B– rating).

during the analyzed period defaulted on their debt obligations (six out of nineteen rated countries, or 32 percent of all rated sovereigns), even if only for a short period. In the case of Fitch, this list includes Argentina, the Dominican Republic, Ecuador, Jamaica, Uruguay, and Venezuela (figure 4).

The average of the worst assessments by Fitch for the region was a B–, shown as the dashed line in figure 4, one notch higher than the Standard & Poor's average and one notch lower than Moody's. The average for the best assessments was a BB+, one notch lower than the Standard & Poor's average but on par with Moody's. The difference between the top and bottom ratings was five notches on average, on par with Moody's and lower than the Standard & Poor's average of seven notches.

Historical Trends

The evolution of credit ratings closely followed the region's business cycle. During the financial shocks of the late 1990s, many of the countries in the region were downgraded, but there was a trend toward improved credit quality in the 2000s, especially after 2003. Sovereign credit quality deteriorated during the global financial crisis of 2008 but resumed its ascendant trend soon

F I G U R E 5 . Evolution of Credit Ratings in Latin America and the Caribbean: Standard & Poor's, Moody's, and Fitch
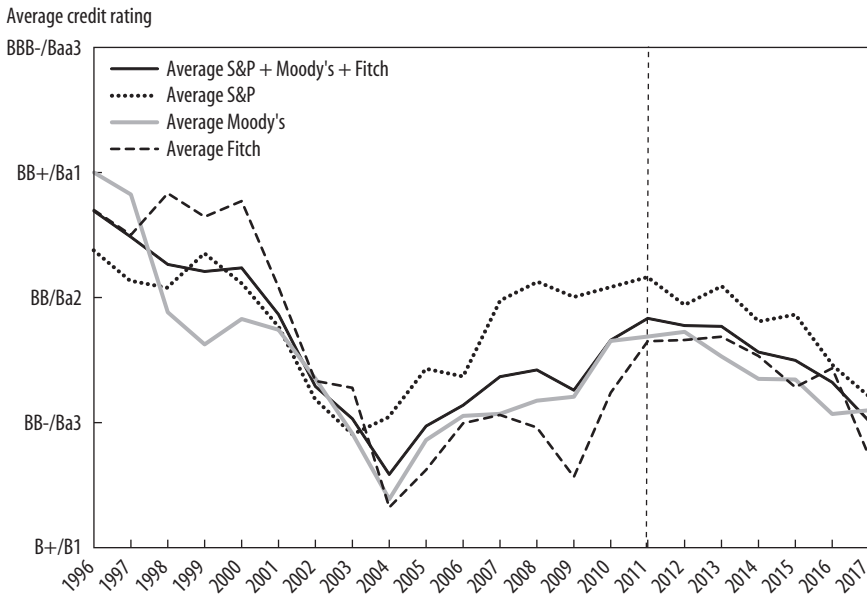
Average credit rating

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.

afterward, reaching a peak in 2011, which coincided with the end of the commodity supercycle. Sovereign credit quality in the region remained generally stable until 2013, when there was a reversal in direction toward a downward trend, which continued through 2017 (figure 5). This pause and reversal of the upward trend since 2011 is not particular to Latin America and the Caribbean; other emerging markets have recorded the same pattern. According to S&P Global Ratings, 2018 was the first time in eight years that sovereign upgrades outnumbered downgrades.[17]

Further analysis suggests that this late trend varies by subregion. For South America and Mexico, credit quality recorded an upward trend, with upgrades outpacing downgrades on a yearly basis from 2003 until 2013 (figure 6).[18]

17. S&P Global Ratings (2019).
18. South America includes Argentina, Bolivia, Brazil, Chile, Colombia, Paraguay, Peru, Uruguay, and Venezuela. Following Bustillo and Velloso (2013), Mexico is added to this group of countries, as its access to international bond markets has followed similar patterns.

F I G U R E 6 . **Average Credit Ratings by Subregion, 2002–2017: Standard & Poor's, Moody's, and Fitch**
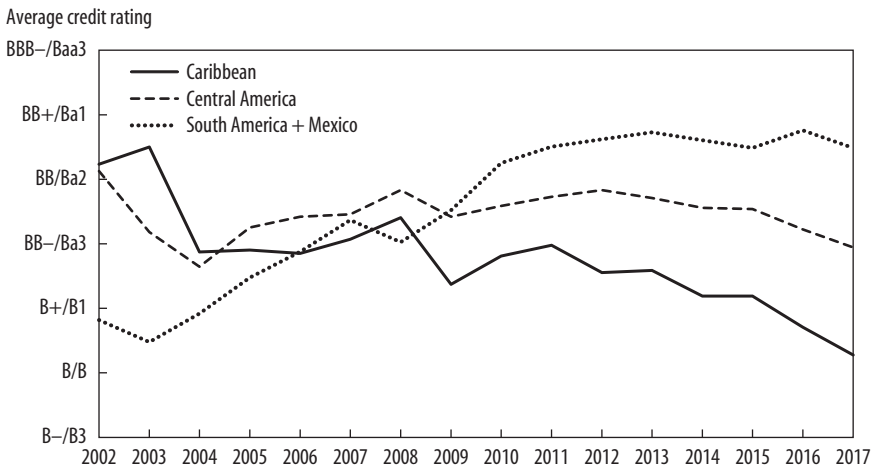
Average credit rating

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.

The upgrade cycle was momentarily interrupted during the global financial crisis, but the positive trend soon returned. Lower financing needs on the part of the countries, prudent economic policies, including improvement in key vulnerability indicators, and strong economic growth led to the steady and continued trend of credit upgrades in this subregion in the period. The decline in creditworthiness since then is not as clear or as steep as it is for the other subregions. For example, the subregion saw an improvement in ratings, on average, from 2015 to 2016, only to deteriorate again after that. The upward trend in average credit quality has stalled since 2013, but creditworthiness remains a lot higher than in 2003.

Overall, credit ratings for the Caribbean and Central American countries did not follow the same trajectory,[19] showing a slower and more gradual recovery following the global financial crisis. In Central America, there was a slight recovery from the downgrades in 2008, but since 2012 credit quality in the subregion has been on a slight downward trend. In the case of the

19. For the purposes of this paper, Central America includes Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama; and the Caribbean includes the Bahamas, Barbados, Belize, Jamaica, and Trinidad and Tobago.

Caribbean, credit ratings have been on a downward trend since the mid-1990s.[20] Many Caribbean countries suffered downgrades following the onset of the 2008 financial crisis, and as of the end of 2017 most had not yet recovered their previous standing (table 5). This reflects their more sluggish post-crisis recovery relative to the rest of the region. The Caribbean downgrades were based on credit weakness and fiscal deterioration, as financial instability stemming from the global financial crisis weighed heavily on the countries' fiscal accounts.

The list of investment-grade countries in the region increased from four in 2002 (Barbados, Chile, Mexico, and Trinidad and Tobago) to ten by the end of 2011 (Barbados, Brazil, the Bahamas, Chile, Costa Rica, Colombia, Mexico, Panama, Peru, and Trinidad and Tobago).[21] Uruguay received an investment-grade rating in 2012, increasing this number to eleven. Investment-grade status reduces financing costs significantly by improving market expectations and encouraging higher inflows from a broader and more diversified investor base. Reaching investment grade can lower sovereign spreads significantly.[22] By the end of 2017, there were only eight investment-grade sovereigns in the region, however, following Barbados's loss of investment-grade status in 2012, Costa Rica's in 2013, and Brazil's at the end of 2015.[23]

Impact of Credit Rating Changes on Debt Spreads

There is a negative relationship between credit ratings and spreads. Sovereigns with better credit ratings usually have lower spreads than sovereigns with worse credit ratings, as illustrated by the exponential trend line shown in figure 7, which covers the trends of the past fifteen years (2002–17). The figure shows that the number of investment-grade countries in Latin America

20. For the longer-term trend in Caribbean credit ratings, see Bustillo, Velloso, Dookeran, and Perrotti (2018, pp. 29–32).

21. At the end of 2011, Costa Rica had an investment-grade rating only from Moody's, with a non-investment-grade rating from Standard & Poor's and Fitch. From an investor's perspective, however, a sovereign must be rated at BBB− or higher by at least two of the three main CRAs to be considered as having investment-grade status.

22. Jaramillo and Tejada (2011).

23. Of these eight sovereigns, two were on the way to losing their investment-grade status. The Bahamas lost their investment-grade rating from Standard & Poor's in December 2016 but kept a lower investment-grade rating from Moody's, while Trinidad and Tobago lost its investment-grade rating from Moody's in April 2017 but kept a lower investment-grade rating from Standard & Poor's.

T A B L E 5 . Credit Ratings in Latin America and the Caribbean by Subregion: 2002, 2007, 2012, and 2017

Subregion and country	Standard & Poor's				Moody's				Fitch			
	2002	2007	2012	2017	2002	2007	2012	2017	2002	2007	2012	2017
South America and Mexico												
Argentina	SD	B+	B–	B+	Ca	B3	B3	B2	RD	RD	CC	B
Bolivia	B+	B–	BB–	BB	B1	Caa1	Ba3	Ba3	…	B–	BB–	BB–
Brazil	B+	BB+	BBB	BB	B2	Ba1	Baa2	Ba2	B	BB+	BBB	BB
Chile	A–	A+	AA–	A+	Baa1	A2	Aa3	Aa3	A–	A	A+	A
Colombia	BB	BBB–	BBB–	BBB–	Ba2	Ba2	Baa3	Baa2	BB	BB+	BBB–	BBB
Ecuador	CCC+	B–	B–	B–	Caa2	B2	Caa1	B3	CCC+	CCC	B–	B
Mexico	BBB–	BBB+	BBB	BBB+	Baa2	Baa1	Baa1	A3	BBB–	BBB+	BBB	BBB+
Paraguay	B–	B	BB–	BB	B2	Caa1	B1	Ba1	…	…	…	BB
Peru	BB–	BB+	BBB	BBB+	Ba3	Ba2	Baa2	A3	BB–	BB+	BBB	BBB+
Uruguay	B–	BB–	BBB–	BBB	B3	B1	Baa3	Baa2	B	B–	BB+	BBB–
Venezuela	CCC+	BB–	B+	SD	B3	B2	B2	Caa3	B	BB–	B+	RD
Central America												
Costa Rica	BB	BB	BB	BB–	Ba1	Ba1	Baa3	Ba2	BB	BB	BB+	BB
Dom. Republic	BB–	B+	B+	BB–	Ba2	B2	B1	Ba3	…	B	B	B+
El Salvador	BB+	BB+	BB–	CCC+	Baa3	Baa3	Ba3	B3	BB+	BB+	BB	CCC
Guatemala	BB	BB	BB	BB–	Ba2	Ba2	Ba1	Ba1	…	BB+	BB+	BB
Honduras	…	…	B+	BB–	B2	B2	B2	B1	…	…	…	…
Nicaragua	…	…	…	B+	B2	Caa1	B3	B2	…	…	…	B+
Panama	BB	BB	BBB	BBB	Ba1	Ba1	Baa2	Baa2	BB+	BB+	BBB	BBB
Caribbean												
Bahamas	…	A–	BBB	BB+	A3	A3	A3	Baa3	…	…	…	…
Barbados	A–	BBB+	BB+	CCC+	Baa2	Baa2	Baa3	Caa3	…	…	…	…
Belize	B+	B	SD	B–	Ba2	Caa1	Ca	B3	…	…	…	…
Jamaica	B+	B	B–	B	Ba3	B1	B3	B3	…	B+	B–	B
Suriname	B–	B+	BB–	B	…	B1	Ba3	B1	…	B	BB–	B–
St Vincent and the Grenadines	…	…	…	…	…	…	…	B3	…	…	…	…
Trinidad & Tobago	BBB–	A–	A	BBB+	Baa3	Baa1	Baa1	Ba1	…	…	…	…

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.
Note: Ellipses (…) indicate not applicable.

FIGURE 7. Sovereign Credit Ratings and Spreads in 2002 and 2017: Standard & Poor's, Moody's, and Fitch
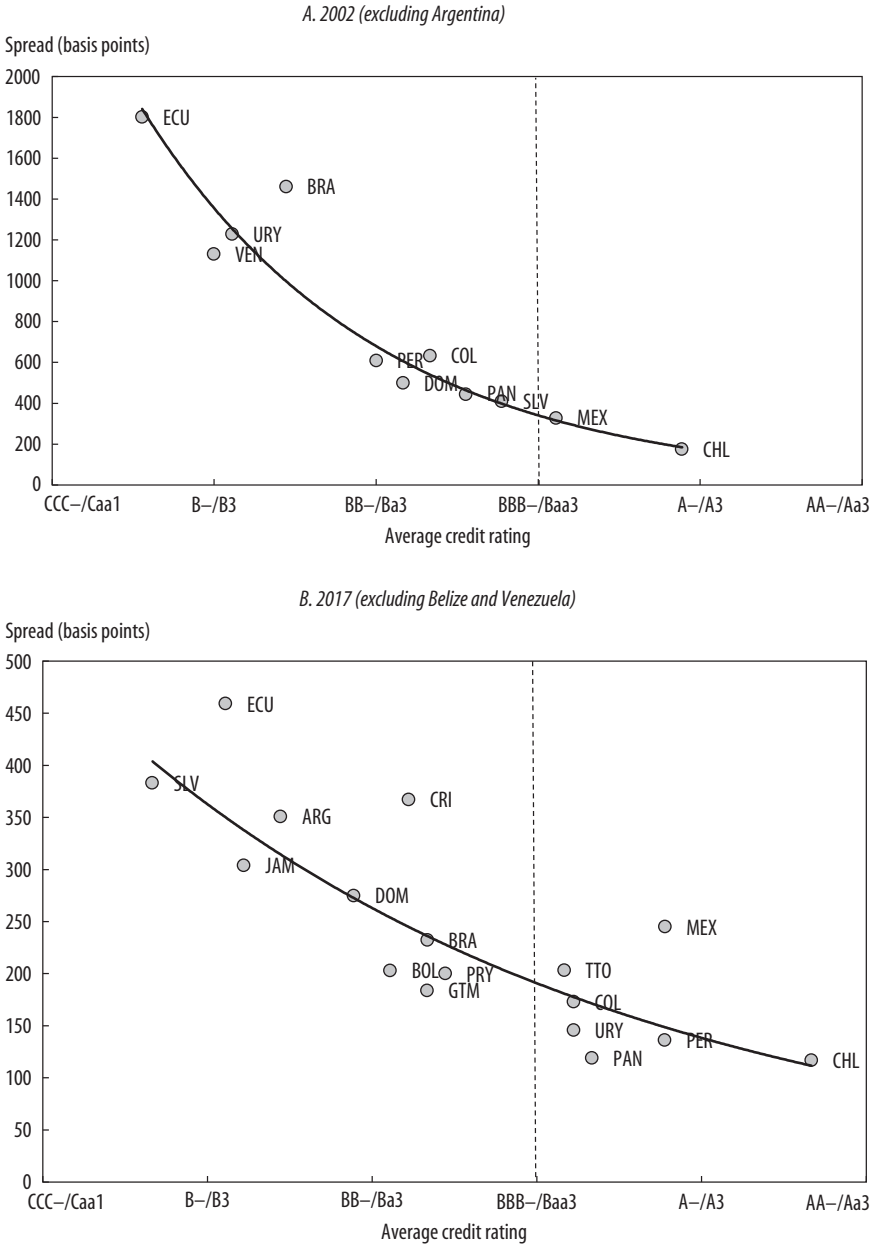
A. 2002 (excluding Argentina)

B. 2017 (excluding Belize and Venezuela)

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services and J.P. Morgan Emerging Market Bond Index Global (EMBIG).

Notes: The horizontal axis corresponds to average sovereign credit ratings; the vertical axis is the EMBIG spread in basis points. The vertical dashed line indicates the investment-grade threshold.

and the Caribbean increased significantly in the 2000s, and spreads tend to increase substantially for countries with speculative credit ratings. By the end of 2002, Argentina's average spreads reached 6,342 basis points following its downgrade to selective default by Standard & Poor's and restricted default by Fitch.[24]

More countries are included in the 2017 sample, as J.P. Morgan added Belize, Jamaica, and Trinidad and Tobago to its EMBIG index in 2007, Costa Rica and Guatemala in 2012, and Bolivia and Paraguay in 2013. This later sample confirms that spreads tend to increase substantially for countries with speculative credit ratings. By November 2017, Venezuela's average spreads reached 4,854 basis points, following its downgrade to selective default by Standard & Poor's and restricted default by Fitch. Belize's spreads reached a peak of almost 2,000 basis points in December 2016, before the country's third debt restructuring in a period of ten years, and were at 771 basis points at the end of 2017.[25]

In 2002, the slope of the curve was steeper, meaning that the gap between spreads associated with lower credit ratings and spreads associated with higher credit ratings was higher than in 2017. In 2002, many countries of the region were still in crisis mode, while 2017 followed a period of a very favorable global environment and a commodity boom that led to strong macroeconomic and financial performance in the region, as well as to an upward trend in creditworthiness.

The region's external financial scenario has become more volatile since 2011 (particularly since 2013, when the U.S. Federal Reserve first announced it would start to unwind its fiscal stimulus and start tapering off its quantitative easing program). The upward trend in creditworthiness has also stalled since then. The outlook for sovereign ratings provides a prospective indication of the agencies' credit views on the countries of the region. By the end of 2011, twelve of the rated sovereign issuers in the region had a positive outlook from one or more of the three main CRAs (Standard & Poor's, Moody's and Fitch Ratings), and only two had a negative outlook. By the end of 2017, the situation was reversed: there were ten countries with a negative outlook and only two with a positive outlook.

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24. Because of its high bond spreads, Argentina was removed from the 2002 sample in figure 7.

25. Because of their high bond spreads, both Belize and Venezuela were removed from the 2017 sample in figure 7.

T A B L E 6 .   **Estimation Time Span, by Country**

Country	First observation	Country	First observation
Argentina	2 Jan 2003	Guatemala	29 Jun 2012
Belize	3 May 2007	Jamaica	31 Oct 2007
Brazil	2 Jan 2003	Mexico	2 Jan 2003
Chile	2 Jan 2003	Panama	2 Jan 2003
Colombia	2 Jan 2003	Peru	2 Jan 2003
Costa Rica	31 Jul 2012	Trinidad and Tobago	31 May 2007
Dominican Republic	2 Jan 2003	Uruguay	2 Jan 2003
Ecuador	2 Jan 2003	Venezuela	2 Jan 2003
El Salvador	2 Jan 2003		

Source: Authors' elaboration, based on data from J.P. Morgan.
Notes: In the case of Belize, Costa Rica, Guatemala, Jamaica, and Trinidad and Tobago, only the credit rating actions that took place on or after the first observation are considered in the event study.

Empirical Model

Our empirical model focuses on events that imply an effective rating change (a downgrade or an upgrade), leaving out revisions and outlooks to avoid potential bias through contamination or clustering effects (the methodology assumes that different events are independent and do not overlap, implying zero covariance). Moreover, similar qualitative results held when credit watch and outlook revisions were included in the analysis, but they were not always statistically significant, while the results for effective rating changes were.

Our data set for the empirical model contains credit rating changes from Standard & Poor's, Moody's, and Fitch Ratings, together with sovereign country risk as measured by J.P. Morgan's EMBIG spreads, which represents the cost of borrowing abroad. The sample contains seventeen Latin American and Caribbean countries for which data on both credit ratings and EMBIG spreads are available.[26] The data frequency is daily, and the period of analysis is from January 1, 2003, to 31 December 31, 2017. The first observation for each country varies because of EMBIG data availability, but all countries have the final value on the last business day of December 2017 (see table 6).

The behavior of EMBIG spreads varies widely by country, highlighting differences in volatility. At one end, Argentina, Venezuela, and Ecuador show the

26. The seventeen countries are Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

TABLE 7. **EMBIG Spreads by Country: Descriptive Statistics**

Country	No. observations	Mean	Std. dev.	Minimum	Maximum
Argentina	3,749	1,434	1,724	185	6,908
Belize	2,663	1,037	459	367	2,644
Brazil	3,749	322	192	133	1,460
Chile	3,749	141	59	52	411
Colombia	3,749	253	120	95	741
Costa Rica	1,353	389	76	210	605
Dominican Republic	3,749	503	314	122	1,785
Ecuador	3,749	916	631	337	5,069
El Salvador	3,749	375	146	99	928
Guatemala	1,374	243	39	159	374
Jamaica	2,538	532	173	278	1,189
Mexico	3,749	211	69	89	627
Panama	3,749	221	87	110	648
Peru	3,749	220	101	91	653
Trinidad and Tobago	1,541	298	152	100	955
Uruguay	3,749	318	218	103	1,451
Venezuela	3,749	1,241	904	161	4,982

Source: Authors' elaboration, based on data from J.P. Morgan Emerging Market Bond Index Global (EMBIG).
Note: Data were compiled for the time span specified in table 6.

highest volatility (as measured by the standard deviation) over the 2003–17 period; at the other end, Guatemala, Chile, and Mexico show the lowest (table 7).

There were 280 credit rating changes in 2003–17, with upgrades accounting for more than half (155) of the total (table 8). Standard & Poor's accounts for the largest number of events (122, or 44 percent of total credit changes), followed by Fitch (82, or 29 percent) and Moody's (76, or 27 percent). Standard & Poor's had an equal number of downgrades and upgrades, Moody's had more upgrades than downgrades, and Fitch also had more upgrades than downgrades.

TABLE 8. **Number of Credit Rating Upgrades and Downgrades by Agency**

Agency	Upgrades	Downgrades	Total
Standard & Poor's	61	61	122
Moody's	48	28	76
Fitch	46	35	82
Total	155	125	280

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch.
Note: Data were compiled for the time span specified in table 6.

TABLE 9. **Share of Credit Rating Upgrades and Downgrades by Agency**
Percent

Agency	Upgrades	Downgrades	Total
Standard & Poor's	40	49	44
Moody's	31	22	27
Fitch	2	29	29
Total	100	100	100

Source: Authors' elaboration, based on collected data from Standard & Poor's, Moody's, and Fitch rating services.
Note: Data were compiled for the time span specified in table 6.

TABLE 10. **Number of Credit Rating Changes by Country**

Country	Upgrades	Downgrades	Total
Argentina	13	9	22
Belize	6	10	16
Brazil	17	7	24
Chile	8	2	10
Colombia	9	1	10
Costa Rica	0	4	4
Dominican Republic	11	14	25
Ecuador	17	11	28
El Salvador	3	19	22
Guatemala	0	2	2
Jamaica	11	13	24
Mexico	8	2	10
Panama	7	0	7
Peru	15	0	15
Trinidad and Tobago	1	5	6
Uruguay	20	7	27
Venezuela	9	19	28
Total	155	125	280

Source: Authors' elaboration, based on data from Standard & Poor's, Moody's, and Fitch rating services.
Note: Data were compiled for the time span specified in table 6.

In terms of shares (table 9), Standard & Poor's has the largest share of downgrades (49 percent of total downgrades), followed by Fitch (29 percent) and Moody's (22 percent). In the case of upgrades, Standard & Poor's also has the largest share (40 percent) of total upgrades, followed by Moody's (31 percent) and Fitch (29 percent).

Venezuela, Ecuador, and Uruguay recorded the most changes in credit ratings in the relevant period (table 10). On the other hand, Guatemala, Costa Rica, and Trinidad and Tobago had the fewest credit rating changes. Uruguay (20), Brazil (17), and Ecuador (17) had the highest number of upgrades in the

period, while Venezuela (19), El Salvador (19), and the Dominican Republic (14) had the most downgrades.

To estimate the impact of a credit rating change on EMBIG spreads, we used the event study methodology, which is described in detail in appendix A.[27] Thus, we define the abnormal return (AR) as the actual ex post return of the security (which in our case is the EMBIG spread) over the event window, minus the normal return, which is defined as the return that would be expected if the event (that is, a change in a credit rating) did not take place:

$$AR_{it}^* = R_{it} - E\left[R_{it} \mid x_t\right],$$

where AR_{it}^*, R_{it}, and $E[R_{it}]$ are the abnormal, actual, and normal returns, respectively, for time period t, and x_t is the conditional information for the normal performance model.

Results

Using an estimation window of thirty days[28] and estimating normal returns according to the capital asset pricing model (CAPM), we find an increase (reduction) in EMBIG spreads—our measure of country risk and the cost of borrowing abroad—following a credit rating downgrade (upgrade), with the impact being significantly higher for downgrades than for upgrades, in line with the asymmetry observed in the literature (see table 11). The parameters are statistically significant and have the expected signs.

To check for the robustness of the above results, we conducted an exercise with a different technique for estimating normal returns. In this case, we defined the normal return as the average of a country's EMBIG spreads during the estimation windows, which is a common practice in the literature on this subject. The outcomes were similar to those highlighted in table 11: all estimations are statistically significant, with the expected signs. In addition, the impact of rating changes on EMBIG spreads are almost of the same magnitude (see table 12).

Spatial Analysis

Trends in credit quality varied within Latin America and the Caribbean. For South America and Mexico, credit quality was on an upward trend starting

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27. See Campbell, Lo, and MacKinlay (1996).
28. For results using other estimation windows, see appendix B.

TABLE 11.   Event Study Results

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	73	13.87***	Positive
Moody's	130	41.85***	Positive
Fitch	105	31.63***	Positive
Rating upgrade			
Standard & Poor's	−18	−33.37***	Negative
Moody's	−56	−12.83***	Negative
Fitch	−8	−17.83***	Negative
Downgrade: Simple average	103		
Upgrade: Simple average	−27		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

TABLE 12.   Alternative Normal Return

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	66	12.49***	Positive
Moody's	136	43.93***	Positive
Fitch	99	29.67***	Positive
Rating upgrade			
Standard & Poor's	−19	−35.33***	Negative
Moody's	−64	−14.83***	Negative
Fitch	−14	−30.72***	Negative
Downgrade: Simple average	100		
Upgrade: Simple average	−32		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

in 2003, as mentioned earlier, but in the case of the Caribbean, credit ratings have been on a downward trend since the mid-1990s. Given that historical trends differed depending on the subregion, in this section we examine whether the impact of credit rating changes on sovereign EMBIG spreads is sensitive to spatial clustering.

Our findings suggest that it is. The largest impact on sovereign spreads after a downgrade is observed in South America and Mexico. A tentative explanation is that because credit quality was on an upward trend in this subregion, a reversal in direction had a larger impact on risk premiums and market confidence. This result may also be related to the fall in commodity prices following the peak in mid-2011. If investors perceived the drop in

T A B L E 1 3 .   Results by Subregion: South America and Mexico

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	101	10.68***	Positive
Moody's	263	38.09***	Positive
Fitch	196	30.08***	Positive
Rating upgrade			
Standard & Poor's	−7	−7.9***	Negative
Moody's	−63	−8.98***	Negative
Fitch	−6	−11.1***	Negative
Downgrade: Simple average	187		
Upgrade: Simple average	−25		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

commodity prices as a persistent new trend—that is, as the end of the commodity supercycle—then a downgrade in a subregion where countries are mostly commodity producers would be expected to have a more significant effect on spreads.[29]

The increase in risk premiums after a downgrade is, on average, more than seven times higher than the impact after an upgrade in South America and Mexico (table 13). At the individual agency level, this subregion presents more volatility in the results than the other two subregions. Further analysis is needed to understand why the impact on spreads from a downgrade by Moody's, for example, is greater than the impact on spreads resulting from a downgrade by other agencies. However, as shown in table 8, Moody's had the lowest number of downgrades in the analyzed period (twenty-eight, versus sixty-one downgrades by Standard & Poor's and thirty-five by Fitch), and perhaps the lower frequency of downgrades made their market impact more powerful. Moreover, as described earlier, Moody's is the agency with the smallest gap between the averages of best and worst assessments, suggesting less severe changes and more stability in its evaluations.

In the Caribbean, the impact of both downgrades and upgrades is more balanced, with downgrades having a slightly higher impact on risk premiums (table 14). For Central America, our results suggest that credit rating changes have had little impact on sovereign spreads (table 15).

29. We would like to thank Carlos Végh for his input in the interpretation of this result.

T A B L E   1 4 .   Results by Subregion: Caribbean

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	86	8.11***	Positive
Moody's	61	17.34***	Positive
Fitch	41	11.57***	Positive
Rating upgrade			
Standard & Poor's	−48	−69.29***	Negative
Moody's	−68	−90.84***	Negative
Fitch	−13	−24.71***	Negative
Downgrade: Simple average	63		
Upgrade: Simple average	−43		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

T A B L E   1 5 .   Results by Subregion: Central America

| Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	13	6.96***	Positive
Moody's	1	2.12**	Positive
Fitch	7	6.50***	Positive
Rating upgrade			
Standard & Poor's	−10	−7.04***	Negative
Moody's	−5	−1.73**	Negative
Fitch	−16	−9.52***	Negative
Downgrade: Simple average	7		
Upgrade: Simple average	−10		

Source: Authors' estimations.
** One-tailed significance level of 5 percent.
*** One-tailed significance level of 1 percent.

Temporal Analysis

We also examine whether the impact of credit rating changes on sovereign EMBIG spreads is sensitive to temporal clustering. Three different periods are considered: 2003–07, 2008–12, and 2013–17. The first—from January 1, 2003, to 31 December 31, 2007—accounts for years of economic and fiscal boom in a major number of Latin American and Caribbean countries. The second—from January 1, 2008, to December 31, 2012—is a period of worsening economic and social performance for the region, due in part to the global financial crisis of 2008–09, which adversely affected fiscal balances in several countries and led to a sequence of credit rating downgrades. The

FIGURE 8.   Number of Credit Rating Changes in Latin America and the Caribbean, 2003–2017
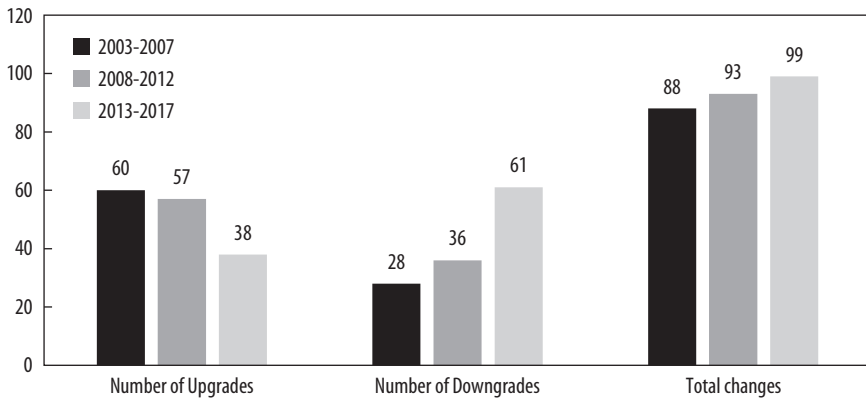
Source: Authors' estimations, based on data from Standard & Poor's, Moody's, and Fitch rating services.

last—from January 1, 2013, to December 31, 2017—includes the post-crisis period and is characterized by slow economic growth, but better financial prospects than during the crisis phase.

The total number of credit rating changes included in the database is slightly higher in the last period, where ninety-nine rating changes are observed, compared with eighty-eight changes in the first period and ninety-three in the second. Most downgrades happened during the last period (2013–17) (sixty-one of 125 downgrades, or about 50 percent of the total), while upgrades mainly took place in the first two periods (with 117 of 155 upgrades, or 75 percent of the total), particularly in the first period (figure 8). As shown in the previous section, after peaking in 2011, the upward trend in Latin American and Caribbean credit quality first stalled and then started to reverse direction in 2013.

There are interesting differences between the three periods. For example, the first two periods show more variation among agencies in terms of the estimated impact, both for upgrades and downgrades (tables 16 and 17). This contrasts with the last period, when the estimated impact on sovereign spreads from credit rating changes by different agencies appear to be more convergent (table 18).

On average, the largest impact on spreads due to a downgrade is observed in 2008–12, which followed a boom period when credit quality in the region was on the rise and global economic conditions were extremely favorable

T A B L E 1 6 . **Results by Time Period: 2003–2007**

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	65	10.37***	Positive
Moody's	38	6.93***	Positive
Fitch	79	38.28***	Positive
Rating upgrade			
Standard & Poor's	−2	−1.41*	Negative
Moody's	−110	−8.85***	Negative
Fitch	−15	−22.00***	Negative
Downgrade: Simple average	61		
Upgrade: Simple average	−42		

Source: Authors' estimations.
* One-tailed significance level of 10 percent.
*** One-tailed significance level of 1 percent.

T A B L E 1 7 . **Results by Time Period: 2008–2012**

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	80	11.13***	Positive
Moody's	189	41.10***	Positive
Fitch	192	43.87***	Positive
Rating upgrade			
Standard & Poor's	−19	−33.67***	Negative
Moody's	−21	−24.22***	Negative
Fitch	−6	−10.46***	Negative
Downgrade: Simple average	153		
Upgrade: Simple average	−15		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

to emerging markets. The good performance of emerging markets during the boom years raised speculation that they had decoupled from developments in developed markets. A downgrade in the 2008–12 period was thus out of step with the previous underlying trend and with the widespread belief that emerging markets would not be seriously affected by developed economies' woes. Consequently, the impact of a sovereign downgrade on sovereign spreads was stronger, as it broke with trend and had a component of surprise.

The lowest impact is observed in 2013–17, when most of the downgrades took place. The fact that the upward trend in credit quality had already reached

TABLE 18.   **Results by Time Period: 2013–2017**

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	28	3.42***	Positive
Moody's	15	2.60***	Positive
Fitch	31	4.06***	Positive
Rating upgrade			
Standard & Poor's	−21	−50.46***	Negative
Moody's	−17	−22.15***	Negative
Fitch	−7	−16.90***	Negative
Downgrade: Simple average	25		
Upgrade: Simple average	−15		

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

a peak and started to reverse during this final period indicates that downgrades became less of a surprise than in previous periods, when credit quality was on the rise.

On the other hand, the three periods show a similar impact after upgrades, with values around or below −20 basis points. The one exception is for Moody's in 2003–07, the reason for which would require further investigation. However, Moody's had fewer upgrades than the other agencies in this period (fourteen, versus twenty-six for Standard & Poor's and twenty for Fitch), accounting for only 23 percent of the total number of upgrades. The lower frequency of upgrades may have led to a stronger market reaction and a higher impact on bond spreads.

Spillover Effects

In this section, we investigate whether non-event countries are affected by the rating event in a given country. The focus is thus on the propagation or spillover effect. To measure the spillover effect, we estimate the normal return as the average EMBIG for all the countries in the sample except the one facing the rating change, over an estimation window of thirty days before the event:

$$NR_{jt} = \frac{1}{J} \sum_{j=1, j \neq i}^{J} \text{EMBIG}_{jt},$$

where $t = -1$ to -30.

TABLE 19. Spillover Effect: Full Period (2003–2017)

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard & Poor's	−8.96	−4.99	Positive
Moody's	1.44	0.69	Positive
Fitch	4.15	2.80 ***	Positive
Rating upgrade			
Standard and	−0.06	−0.06	Negative
Poor's			
Moody's	2.21	1.53	Negative
Fitch	−4.88	−5.11 ***	Negative

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

The observed return is measured as the average EMBIG for all countries (except the one facing the rating change) over the post-estimation window of ten days after the event:

$$OR_{jt} = \frac{1}{J} \sum_{j=1, j\neq i}^{J} \mathrm{EMBIG}_{jt},$$

where $t = 1$ to 10.[30]

The abnormal return is then estimated as the difference between the observed return and the normal return. The data are then aggregated (both spatially and temporally) to check for statistical significance, applying the event study methodology described in appendix A.

The results suggest a somewhat limited spillover effect. For example, for the full sample (table 19), the only statistically significant spillover impact corresponds to upgrades and downgrades from Fitch. However, in terms of basis points, the impact is of reduced magnitude and significantly lower than the direct effects observed in the previous three sections. The results are similar when we consider the spillover impact on non-event countries of credit rating events taking place in the top five Latin American and Caribbean issuers of external sovereign debt during the analyzed period (table 20).

30. As noted, we present results for a post-estimation window of ten days. We also considered post-estimation windows of five and thirty days, with similar results to those presented below.

TABLE 20. Spillover Effect: Top Five Latin America and the Caribbean Issuers

Event type	Average cumulative change in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard& Poor's	−0.67	−0.28	Positive
Moody's	−4.76	−0.97	Positive
Fitch	6.66	2.78***	Positive
Rating upgrade			
Standard and Poor's	−3.90	−2.19**	Negative
Moody's	1.41	0.72	Negative
Fitch	−6.91	−4.87***	Negative

Source: Authors' estimations.
** One-tailed significance level of 5 percent.
*** One-tailed significance level of 1 percent.

TABLE 21. Spillover Effect: 2008–2012

Event type	Average cumulative chang in spreads (basis points)	Z statistic	Expected sign
Rating downgrade			
Standard& Poor's	15.30	5.82***	Positive
Moody's	16.12	3.98***	Positive
Fitch	25.51	4.59***	Positive
Rating upgrade			
Standard and Poor's	3.72	2.40	Negative
Moody's	−2.28	−0.74	Negative
Fitch	−7.22	−4.46***	Negative

Source: Authors' estimations.
*** One-tailed significance level of 1 percent.

We also performed spillover tests for the three subregions (South America and Mexico; Central America; and the Caribbean) and the three subperiods (2003–07, 2008–12, and 2013–17). In the case of the former, our estimations suggest that a given country's credit rating change does not generate significant spillover effects on the non-event countries within the same subregion. In the case of the latter, we find that 2008–12 was the subperiod with the most statistically significant results and the only one with a more significant spillover impact (table 21). During this period, a downgrade by Standard & Poor's, Moody's, and Fitch has an average spillover effect of 15, 16, and 25 basis points, respectively. This is consistent with the overall analysis presented earlier, which also showed that, on average, downgrades had the largest impact on spreads in 2008–12.

Final Thoughts

This paper has taken a regional approach to study the relationship between sovereign credit ratings and the cost of borrowing in all of Latin America and the Caribbean. For that purpose, we put together the history of sovereign credit ratings in the region from when they were first assigned until December 2017, including all countries that have received a credit rating (twenty-seven in total) and covering more than fifty years of data. An event study was performed to estimate the impact of credit rating changes on country risk (that is, the EMBIG) during the fifteen-year period when access to external financing expanded. The study uses CAPM as the benchmark model for the estimation of normal returns. We find that, consistent with the literature, there is an asymmetric impact on sovereign bond spreads, with credit rating downgrades generating a larger impact than upgrades.

The results are sensitive to spatial and temporal clustering, however. After grouping the data in three subregions, the largest impact following a downgrade is observed in South America and Mexico, where credit quality improved the most in the period and where the largest economies of the region are located. In the Caribbean, the impacts of downgrades and upgrades are more balanced, with downgrades having a slightly larger impact on risk premiums. In Central America, the results suggest that credit rating changes had little impact on sovereign spreads.

When the data set is divided into three five-year subperiods, the largest impact on sovereign spreads after a downgrade and the largest spillover effects (when negative events were more likely to propagate to non-event countries) are observed in 2008–12. This follows a period of improvement in credit ratings in 2003–07. Insofar as credit rating events transmit information to investors, one might expect that the impact of a credit rating event on the market's valuation of country risk would depend on the magnitude of the unexpected component of the event. In this case, a break with an underlying trend qualifies as unexpected. The highest number of downgrades took place in 2013–17, when a reversal of the upward trend in credit quality was observed.

Our results suggest that the quality of sovereign credit plays an important role in determining the cost of access to private external financing. This becomes particularly relevant as private financing grows in the context of the 2030 Sustainable Development Agenda and the need to increase the mobilization

of resources for its implementation.[31] In this context, it is important to reflect on what policies and best practices could be implemented to try to maintain a higher level of credit quality in a less favorable external environment.

Appendix A: Event Study Methodology

This appendix provides an overview of some essential aspects of the event study methodology applied in this paper. The relevant literature is extensive, beginning in the 1930s.[32] However, two significant contributions are the seminal papers by Ball and Brown and by Fama, Fisher, Jensen, and Roll, which introduced the methodology that is essentially still in use.[33]

In general terms, the event study methodology has the purpose of isolating the incremental impact of an event on a variable of interest, relative to the normal performance of that variable. In our paper, an event is defined as a credit rating change, with the two possible outcomes:[34]
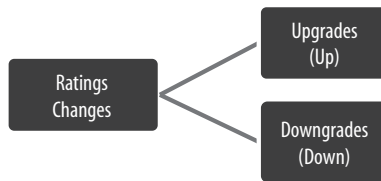
Following Campbell, Lo, and MacKinlay, the abnormal return is the actual ex post return of the security (our measure of sovereign risk, EMBIG spreads) over the event window minus the normal return, defined as the return that should be expected if the event did not take place:[35]

$$AR_{it}^* = R_{it} - E\big[R_{it}|x_t\big],$$

31. ECLAC (2017).
32. See, for example, the references in Kothari and Warner (2007).
33. Ball and Brown (1968); Fama, Fisher, Jensen, and Roll (1969). See Campbell, Lo, and MacKinlay (1996).
34. A rating change represents the actual change on the sovereign credit rating based on a shift in the credit rating agencies' perception of the likelihood of a rated debt obligation being repaid in full and on time.
35. Campbell, Lo, and MacKinlay (1996).

where AR^*_{it}, $R_{i,t}$, and $E[R_{i,t}]$ are the abnormal, actual, and normal returns. respectively, in period t; and x$_t$ is the conditional information for the normal performance model. At this point, we face the key decision of how to measure normal returns (that is, the returns that would have occurred if the event had not happened), which will be extracted from actual returns for the identification of abnormal returns. There are two main ways to do this: a statistical approach or an econometric approach. The most commonly used statistical approaches are the market model (MM), the constant mean return model (CMRM), and the factor model (FM). In the case of econometrics models, the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT) are the most widespread methodologies. We decided to use the CAPM as our benchmark model since it accounts for more sophisticated financial specifications than the CMRM.

The time window is composed of the following four stages: the estimation window, which is the time frame for estimating the normal returns; the event window, which specifies when the event of interest takes place; and the pre- and post-event windows, which are used in conjunction with the event window to test for different hypotheses of normality of returns.[36]
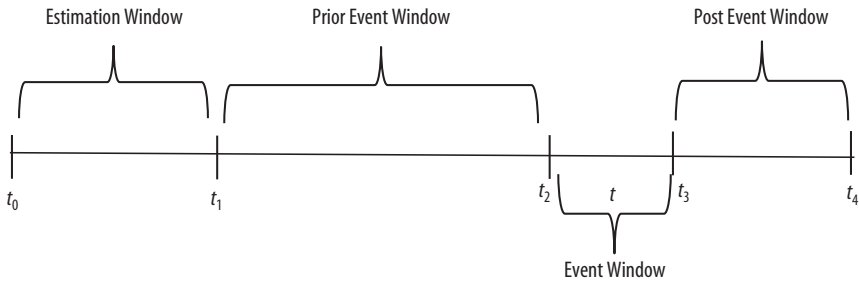
The next step consists in specifying the sampling interval and the event window length, for which it is necessary to first define the following formulas.

The cumulative abnormal return (CAR) over time is defined as

$$CAR_i(T_2, T_3) = \sum_{t=T_2}^{T_3} AR_{ti},$$

36. The diagram is based on Campbell, Low, and MacKinlay (1996).

where T_2 and T_3 are the upper and lower bounds of the event window as defined in the diagram above.

The variance of CAR is given by

$$\text{var}\left[\text{CAR}_i\left(T_2, T_3\right)\right] = \sigma_i^2\left(T_2, T_3\right) = \left(T_3 - T_2 + 1\right) \cdot \sigma_{e_i}^2.$$

For cross-section aggregation purpose, the cumulative average abnormal return (CAAR) is defined as:

$$\text{CAAR}\left(T_2, T_3\right) = \frac{1}{N} \sum_{i=1}^{N} \text{CAR}_i\left(T_2, T_3\right),$$

where N represents the number of events inside each cross-section category.

The variance of CAAR is given by

$$\text{var}\left[\text{CAAR}\left(T_2, T_3\right)\right] = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2\left(T_2, T_3\right).$$

Under the null hypothesis of no event effect, meaning that there is no abnormal return within the event window, the following statistic is constructed for each kind of event—namely, an upgrade or downgrade by a CRA (Standard & Poor's, Moody's, and Fitch):[37]

$$z = \frac{\text{CAAR}\left(T_2, T_3\right)}{\sqrt{\text{var}\left[\text{CAAR}\left(T_2, T_3\right)\right]}} \sim N\left(0, 1\right).$$

We used an estimation window of thirty days, balancing the availability of data and the accuracy of the estimated parameters against the potential contamination bias.[38] The event window was set at two days, which includes the effective day of the event plus the following day. This reflects the lack of information on the precise hour at which the event took place, such that any given event could have happened after trading hours on the event day.

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37. Under the null hypothesis, the abnormal return is zero, meaning that the event does not have any relevant statistical impact.

38. Alternative estimations were made with different prior window lengths, including fifteen and sixty days. The results of these estimations are in line with the thirty-day window (see appendix B).

The selection of the model for estimating normal returns presented similar difficulties to previous works, with regard to the availability of uncontaminated data in the estimation window. Taking this into account, we proceeded to estimate a basic version of the CAPM. In particular, for each individual event in the database (280 in total), we estimated the corresponding CAPM model, with the values included in the estimation window.

The CAPM is defined as

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it},$$

with $E[\varepsilon_{it}] = 0$ and var $[\varepsilon_{it}] = \sigma_i^2$, where R_{it} and R_{mt} are the period t returns on security i and on the market portfolio, respectively; ε_{it} is the zero-mean disturbance term; and α_i, β_i, and σ_i^2 are the parameters of the model. Interpreting this model in the space of country risk measurement, and rearranging it for estimation purposes, we have:

$$E(R_{it}) = R_f + \beta_i \left[E(R_{mt}) - R_f \right],$$

where $E(R_{it})$ is the expected value of country i's EMBIG, at time t; and $E(R_{mt})$ denotes the expected value of the Latin EMBIG, at time t. In our case, the risk-free asset, R_f, is intrinsically incorporated in the definition of EMBIG, which considers countries' sovereign spreads over similar but risk-free assets.

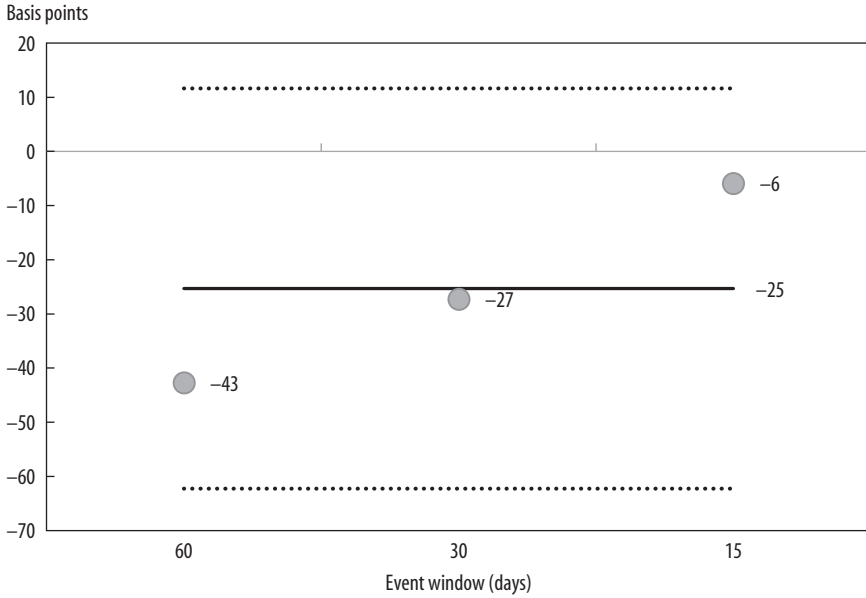The parameter β_i could be expressed as:

$$\beta_i = \frac{\text{cov}(R_i, R_m)}{\sigma_{E(R_m)}^2}$$

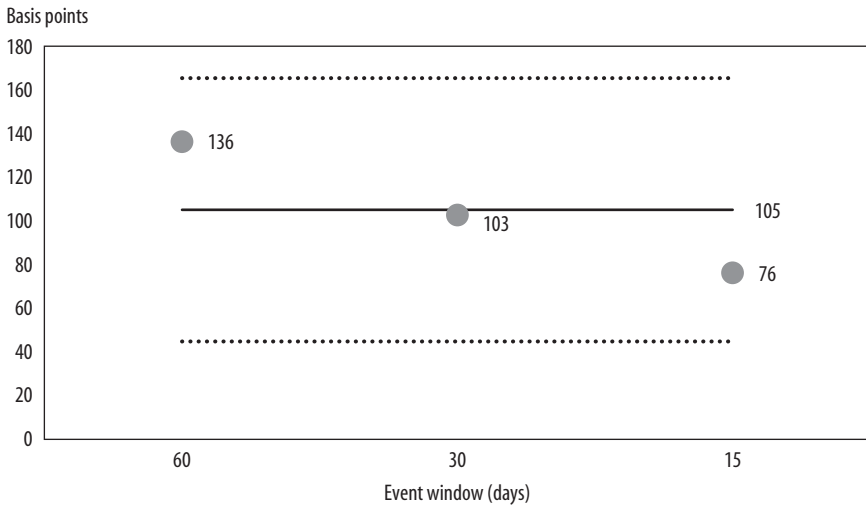The results of using the above methodology are discussed in the main text.

Appendix B: Results Using Other Estimation Windows

As mentioned in appendix A, we performed the event study accounting for different estimation windows. The summary of these results for both upgrades and downgrades are presented in the figures B1 and B2. The thirty-day window, which we selected, is the closest to the average of the values of the three window spans (represented in the figures by the solid line).

FIGURE B1. Upgrades: Average Cumulative Change by Event Window Size, All Agencies

Basis points

Event window (days)

Source: Authors' elaboration.
Notes: The figure graphs estimations using the event study methodology for three different estimation windows of sixty, thirty, and fifteen days. The solid line indicates the average of the three windows; the dotted lines represent +2 and −2 standard deviations.

FIGURE B2. Downgrades: Average Cumulative Change by Event Window Size, All Agencies

Basis points

Event window (days)

Source: Authors' elaboration.
Notes: The figure graphs estimations using the event study methodology for three different estimation windows of sixty, thirty, and fifteen days. The solid line indicates the average of the three windows; the dotted lines represent +2 and −2 standard deviations.

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