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Sovereign credit ratings in Latin America and the Caribbean

Trends and impact on debt spreads

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Abstract

This report examines the history of sovereign credit ratings in Latin America and the Caribbean, the evolution of credit quality, and the relationship between credit rating changes and the cost of accessing external financing reflected in the behavior of sovereign debt spreads. We find an upward trend in credit quality from 2003 to 2011, which supported a sharp compression of bond spreads in the same period. After reaching a peak in 2011, improvement in credit quality stalled, and since 2013 there has been a reversal in direction, with sovereign credit quality in the region showing a slow deterioration.

Applying an event study methodology to estimate the impact of credit rating changes on sovereign bond spreads in the past fifteen years –and focusing on events that imply an effective rating change (a downgrade or an upgrade)– the report shows that: this impact is asymmetric in the period analyzed, with downgrades having a bigger impact than upgrades (103 basis points for a downgrade, compared to -27 basis points for an upgrade); it varies depending on the subregion, with the biggest impact following a downgrade being observed in South America and Mexico, where credit quality improved the most; and it also varies when looking at different time periods, with the biggest impact due to a downgrade being observed in the 2008-2012 period, and the biggest number of downgrades taking placing in the 2013-2017 period, when a reversal of the upward trend in credit quality is observed.

The results confirm that sovereign credit quality has an important role in determining how costly the access to private external financing can be.

List of acronyms

APT	Arbitrage Pricing Theory
CAPM	Capital Asset Pricing Model
CAR	Cumulative Abnormal Returns
CAAR	Cumulative Average Abnormal Return
CMRM	Constant Mean Return Model
CRAs	Credit Rating Agencies
CDS	Credit Default Swaps
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EMs	Emerging Markets
EMBIG	JPMorgan Emerging Market Bond Index - Global
EMBI+	JPMorgan Emerging Market Bond Index - Plus
FM	Factor Models
LAC	Latin America and the Caribbean
MM	Market Model
SDGs	Sustainable Development Goals
S&P's	Standard & Poor's
VAR	Variance

Introduction

Due to historically low internal saving rates, access to external financing is very important to Latin America and the Caribbean (LAC), even more so in the context of the 2030 Agenda and the implementation of the Sustainable Development Goals (SDGs). Public financing falls short of what is needed for this task and must be complemented with private flows, which in fact make up the bulk of the region's external financing (ECLAC 2017). The credit quality of the sovereigns in the region has an important role in determining how costly the access to private external financing can be.

From 2003 to 2011, the increasing trend towards higher credit ratings for LAC issuers supported the sharp compression of bond spreads in the same period. The trend reflected faster growth, lower inflation and tighter public finances, as well as a very benign global environment, with plentiful liquidity and risk appetite. Moreover, the higher overall credit quality of LAC debt and the risk-adjusted returns of the asset class attracted a broader investor base to absorb the significant amounts of new debt issued since 2003. This upward trend in sovereign credit quality reached a peak in 2011, however, and since 2013 there has been a reversal in direction, with sovereign credit quality in the region showing a slow deterioration.

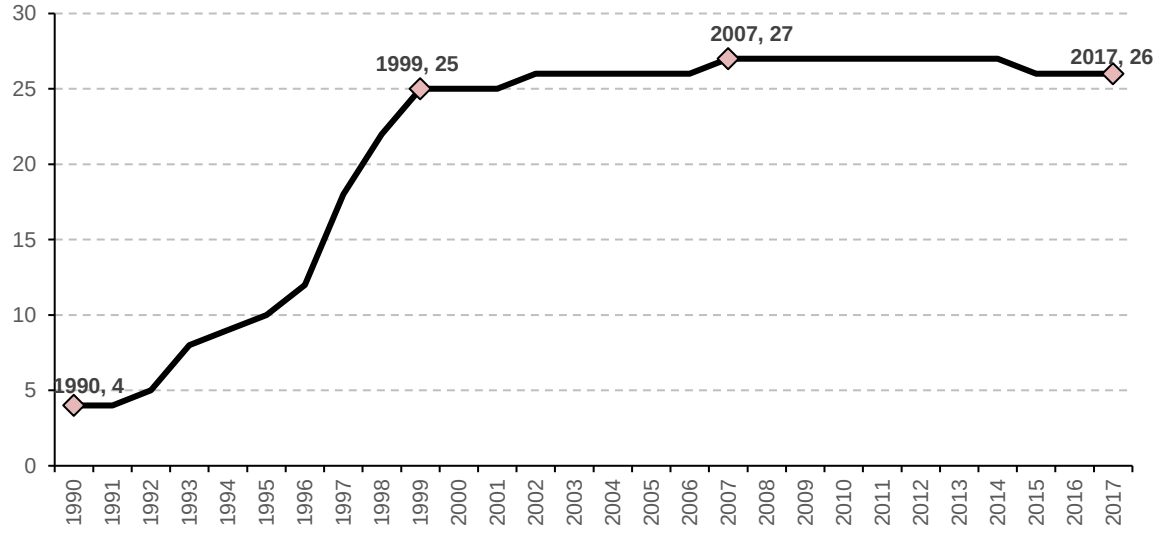
The objective of this study is to bring together the history of sovereign credit ratings in Latin America and the Caribbean and, on the basis of that history, to look at the evolution of credit quality since the mid-1990s, as well as to examine the relationship between credit rating changes and the cost of accessing external financing, reflected in the behavior of sovereign debt spreads in the past fifteen years. The history of sovereign credit ratings in the region, which starts when a sovereign rating is assigned, was first assembled in Bustillo and Velloso (2013) and was updated to December 2017 for the purposes of this paper.

The study is structured as follows. Chapter I describes the long road to improved credit quality for the sovereigns in the region since the mid-1990s, and the reversal in direction since 2013, reflected in a slow downward trend in sovereign credit ratings. It reviews the evolution of sovereign credit ratings for the region, as well as for its subregions, which show different patterns. Chapter II examines the impact of sovereign credit rating changes on the cost of accessing external financing. More precisely, it observes the impact of upgrades and downgrades in LAC sovereign credit ratings from 2003 to 2017 on the behavior of sovereign bond spreads, as measured by the JPMorgan Emerging Market Bond Index Global (EMBIG), using an event study methodology. The chapter examines whether upgrades and downgrades have an asymmetric impact on bond spreads; whether credit rating changes have different impacts depending on the subregion; and whether the impact varies when looking at three different time periods: 2003-2007, 2008-2012, and 2013-2017. Finally, in chapter III, we offer our final thoughts.

I. Evolution of sovereign credit ratings[1]

The 1990s witnessed a sharp increase in the number of rated Latin American and Caribbean sovereigns, as a growing number of governments began to tap global bond markets (figure 1). By the end of the decade, twenty-five Latin American and Caribbean countries were rated, as opposed to only four in 1990 (namely, Argentina, Brazil, and Mexico, rated by Moody's, and the Bolivarian Republic of Venezuela, rated by Moody's and Standard & Poor's). The peak was reached in 2007 with twenty-seven rated sovereigns, but on 31 October 2014, Standard & Poor's removed Grenada's sovereign rating, and the number dropped to twenty-six, which as of end-2017, was the number of rated sovereign issuers in the region (figure 1).

Figure 1
Latin America and the Caribbean: number of rated sovereigns



Source: Authors, based on information from Standard & Poor's Moody's and Fitch.

[1] This chapter is an update of the analysis contained in Bustillo and Velloso (2013), chapter VI.

Being rated by credit rating agencies (CRAs) was an important step to increase access and exposure to a wider range of international investors, as credit ratings can be useful for assessing credit quality where accounting standards are low and where creditor markets are not well developed. In this specific context, CRAs provide additional scrutiny and undertake the costly task of collecting and inspecting data. The agencies are designed to reduce information asymmetries between borrowers and lenders, and as such they play a key role in financial markets. Their role has expanded with financial globalization and received an additional boost from Basel II, which incorporated CRA ratings into the rules for weighting credit risk.

Credit rating agencies provide investors with assessments of borrowers' present and future willingness to pay. This task involves gathering information about what may happen in the future, which is naturally dominated by expectations, and even well-informed agents, such as rating agencies and institutional investors, are subject to expectations. The poor performance of the CRAs during the 2008 global financial crisis brought back questions about their methods, their regulatory status and their role in financial markets, which first arose during the financial crises in emerging markets in the late 1990s and the collapse of Enron in 2001. Whether credit rating agencies can contribute to the dynamics of a financial crisis by either accentuating or attenuating it has been subject to extensive debate since then.

The literature examines the determinants of sovereign ratings, their alleged procyclicality and the relationship between spreads and sovereign ratings. The seminal work of Cantor and Packer (1996) suggests that credit ratings strongly influence capital flows and are a main driver of sovereign bond spreads, which in turn determine the financing costs of the public sector. The authors show that five variables – namely, GDP per capita, indicator variables for economic development and for sovereign default history, inflation and external debt – explain 90% of the ratings issued by Standard & Poor's and Moody's in 1995. They also find that the market, as gauged by sovereign debt yields, broadly shared the relative rankings of sovereign credit risks made by Standard & Poor's and Moody's during the 1987–1994 period. However, credit ratings "appeared to have some independent influence on yields over and above their correlation with other publicly available information" (p. 37). In particular, their results show that rating announcements had immediate effects on market pricing for non-investment grade issues.

There is a bulk of work that has shown that CRAs' actions have an asymmetric impact on bond spreads and financing costs. Larraín, Reisen and von Maltzan (1997) find that a "negative outlook" review by Moody's and Standard & Poor's had a significant impact on spreads in the 1987–1996 period and conclude that rating agencies have the potential to soothe boom-bust spread cycles. Reisen and von Maltzan (1998), who study changes in ratings and outlooks by Standard & Poor's, Moody's and Fitch between 1989 and 1997, conclude that downgrades have a significant impact on bond spreads, whereas upgrades are anticipated by the markets. Jaramillo and Tejada (2011), using a panel dataset for thirty-five emerging market economies for the period 1997–2010, find that sovereign spreads for investment-grade countries are 36% lower than for speculative-grade countries, which the authors say is "above and beyond what is implied by macroeconomic fundamentals" (p. 3). They conclude that spreads are reduced more significantly when sovereigns cross the threshold to investment-grade than when sovereigns are upgraded within credit categories (sub-investment or investment grade).

Broto and Molina (2014) also find that sovereign ratings tend to follow an asymmetric path. 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 underreact when upgrading during calmer times.

Work on the alleged procyclicality of sovereign ratings during financial crises include Ferri, Liu and Stiglitz (1999), who conclude that Moody's and Standard & Poor's failed to predict the Asian crisis and even exacerbated it by downgrading Asian countries more than was justified by the fundamentals. In contrast, Kräussl (2000) argues that massive downgrades do not necessarily intensify a crisis, as was the case of South Korea in 1997. Sy (2001) emphasizes that the strong negative relationship between ratings and the JPMorgan Emerging Market Bond Index Plus (EMBI+) spreads declines during periods of market turbulence. The R^2 coefficient of a simple regression of log spreads on ratings declined during

periods of market turmoil, indicating that the relationship between spreads and ratings is less significant during a crisis.

In summary, while the literature shows that credit ratings and spreads are negatively related, the role of the credit rating agencies and the impact of their announcements on bond spreads may vary depending on the period analyzed. In addition, while the ratings/spreads relationship is very important, the causality is not always clear. In the following sections, we look at the evolution of credit ratings in Latin America and the Caribbean since the mid-1990s and at the relationship between credit ratings and bond spreads in the past fifteen years.

A. Building a dataset for Latin America and the Caribbean

In this paper we built a dataset that brings together the history of Latin America 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 credit rating agencies, Standard & Poor's, Moody's and Fitch. The history put together for this paper is an update and revision of Table VI.1 in Bustillo and Velloso (2013), pp.95-103. Most of the countries of the region received their initial ratings in the 1990s, with a few being already rated before that, while the latest rating assessment for the purposes of this report is the credit rating that was current as of 31 December 2017. Together, the three main credit rating agencies currently rate twenty-six countries in Latin America and the Caribbean (table 1).

According to the collected information, the first sovereign to have been assigned a long-term foreign currency credit rating was Panama. On 30 June 1958, Moody's designated a new A rating to Panama. The A rating was withdrawn on 14 October 1977. On 27 June 1978 the rating was reinstated and upgraded to Aa. It was withdrawn again on 11 November 1985. A new Ba1 rating was assigned on 22 January 1997 and has been current since then.[2] The other sovereign receiving an early rating was Venezuela, which was assigned a new Aaa rating by Moody's on 29 December 1976. It was downgraded to Aa on 4 February 1983 and was withdrawn on 25 March 1983. A new Ba2 rating was assigned on 3 June 1987.[3] In table 1 and the following tables and charts in this section, we take as the initial assessment the rating obtained in January 1997, in the case of Panama, and the rating obtained in June 1987, in the case of Venezuela.

Some countries had a significant difference between their best and worst credit rating assessments during the period analyzed (table 2), including Venezuela (in the case of Standard & Poor's), Barbados (in the case of Moody's) and Uruguay (in the case of Fitch). For many LAC countries, 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 analyzed.

The credit rating history dataset for Latin America and the Caribbean, as of 31 December 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, the number of upgrades outpaced the number of downgrades (table 3). More than half of these credit rating changes (56%), and 64% of the total number of upgrades and 48% of the downgrades, took place in the 2003–2017 period.

To look at the evolution of credit ratings in Latin America and the Caribbean, and to compare the behavior by credit rating agency, sovereign credit ratings were converted to numerical values (table 4).

Looking at agency level, the data shows that in the case of Standard & Poor's, credit ratings improved for thirteen sovereigns in the period analyzed, deteriorated for nine sovereigns and remained the same for three (table 5).

[2] See Bustillo and Velloso (2013), p.100.
[3] Ibid, p. 103.

Table 1
Credit rating history in Latin America and the Caribbean: initial and latest credit rating as of 31 December 2017

Country	Standard & Poor's				Moody's				Fitch			
	Initial rating assessment		Latest rating assessment		Initial rating assessment		Latest rating assessment		Initial rating assessment		Latest rating assessment	
	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	N/A	N/A	N/A	N/A
Barbados	17-Dec-99	A-	3-Mar-17	CCC+	5-Dec-94	Ba2	9-Mar-17	Caa3	N/A	N/A	N/A	N/A
Belize	18-Aug-00	BB	23-Mar-17	B-	21-Jan-99	Ba2	11-Apr-17	B3	N/A	N/A	N/A	N/A
Bolivia (Plurinational State of)	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	N/A	N/A	N/A	N/A	5-Apr-99	Caa1	23-Apr-14	Caa2	N/A	N/A	N/A	N/A
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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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	N/A	N/A	N/A	N/A
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+	N/A	N/A	27-Mar-98	B2	10-Jul-15	B2	16-Dec-15	B+	N/A	N/A
Panama [b]	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	N/A	N/A	N/A	N/A	10-Dec-07	B1	21-Nov-14	B3	N/A	N/A	N/A	N/A
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	N/A	N/A	N/A	N/A
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 (Bolivarian Republic of) [c]	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, based on information from Standard & Poor's, Moody's and Fitch.
Notes: See notes at the end of table 3 on page 16.

Table 2
Credit rating history in Latin America and the Caribbean: best and worst credit rating assessments by country and agency

Country	Standard & Poor's				Moody's				Fitch			
	Best assessment		Worst assessment		Best assessment		Worst assessment		Best assessment		Worst assessment	
	Date(s)	Value	Date(s)	Value	Date(s)	Value	Date(s)	Value	Date(s)	Value	Date(s)	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	N/A	N/A	N/A	N/A
Barbados	17-Dec-99	A-	3-Mar-17	CCC+	8-Feb-00	Baa2	9-Mar-17	Caa3	N/A	N/A	N/A	N/A
Belize	18-Aug-00	BB	7-Dec-06, 21-Aug-12, 20-Mar-17	SD	21-Jan-99	Ba2	1-Jun-12	Ca	N/A	N/A	N/A	N/A
Bolivia (Plurinational State of)	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	N/A	N/A	N/A	N/A	5-Apr-99	Caa1	23-Apr-14	Caa2	N/A	N/A	N/A	N/A
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
Grenada [a]	22-Mar-02	BB-	12-Mar-13	SD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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	N/A	N/A	N/A	N/A
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-Fed-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 [b]	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-Jul-14	A3	5-Feb-96	B2	23-Oct-13	BBB+	14-Oct-99	BB
St. Vincent and the Grenadines	N/A	N/A	N/A	N/A	10-Dec-07	B1	21-Nov-14	B3	N/A	N/A	N/A	N/A
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	N/A	N/A	N/A	N/A
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 (Bolivarian Republic of) [c]	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

Source: Authors, based on information from Standard & Poor's, Moody's and Fitch.
Notes: See notes at the end of table 3 on page 16.

Table 3
Credit rating history in Latin America and the Caribbean: number of credit rating actions by country and by agency

Country	Standard & Poor's			Moody's			Fitch			All Agencies		
	Credit Rating Changes			Credit Rating Changes			Credit Rating Changes			Credit Rating Changes		
	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	N/A	N/A	N/A	0	7	7
Barbados	0	7	7	2	6	8	N/A	N/A	N/A	2	13	15
Belize	3	16	19	4	6	10	N/A	N/A	N/A	7	22	29
Bolivia (Plurinational State of)	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	N/A	N/A	N/A	0	1	1	N/A	N/A	N/A	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 [a]	3	6	9	N/A	N/A	N/A	N/A	N/A	N/A	3	6	9
Guatemala	1	2	3	1	0	1	0	1	1	2	3	5
Honduras	2	5	7	2	1	3	N/A	N/A	N/A	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 [b]	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	N/A	N/A	N/A	0	2	2	N/A	N/A	N/A	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	N/A	N/A	N/A	9	5	14
Uruguay	9	7	16	6	3	9	8	7	15	23	17	40
Venezuela (Bolivarian Republic of) [c]	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, based on information from Standard & Poor's, Moody's and Fitch.
Notes:
a. In the case of Grenada, Standard & Poor's removed its sovereign rating on 31 October 2014; Grenada is thus currently not rated (NR) by any of the credit rating agencies.
b. Moody's assigned a sovereign rating to Panama prior to 1997: on 30 June 1958 Moody's designated a new A rating to Panama, based on a scale prior to the allocation of numerical modifiers 1,2 and 3 to each generic rating classification from Aa through Ca. The A rating was withdrawn on 14 October 1977. On 27 June 1978 the rating was reinstated and upgraded to Aa. It was withdrawn on 11 November 1985. A new Ba1 rating was assigned on 22 January 1997.
c. Moody's assigned a sovereign rating to Venezuela prior to 1987: on 29 December 1976 Moody's designated a new Aaa rating to Venezuela, which was downgraded to Aa on 4 February 1983, based on a scale prior to the allocation of numerical modifiers 1,2 and 3 to each generic rating classification from Aa through Ca, and was withdrawn on 25 March 1983. A new Ba2 rating was assigned on 3 June 1987.

Table 4
Credit rating scale

	S&P	Score	MOODY'S	*Score*	FITCH	*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, based on credit ratings by Standard & Poor's, Moody's and Fitch.

Table 5
Initial and latest credit ratings by Standard & Poor's as of 31 December 2017

	Initial	Final	Difference	
Argentina	10	9	-1	↓
Bahamas	16	12	-4	↓
Barbados	16	6	-10	↓
Belize	11	7	-4	↓
Bolivia (Plurinational State of)	10	11	1	↑
Brazil	8	11	3	↑
Chile	14	18	4	↑
Colombia	13	13	0	-
Costa Rica	11	10	-1	↓
Dominican Republic	9	10	1	↑
Ecuador	1	7	6	↑
El Salvador	11	6	-5	↓
Grenada	10	1	-9	↓
Guatemala	11	10	-1	↓
Honduras	9	10	1	↑
Jamaica	8	8	0	-
Mexico	12	15	3	↑
Nicaragua	9	9	0	-
Panama	12	14	2	↑
Paraguay	10	11	1	↑
Peru	11	15	4	↑
Suriname	7	8	1	↑
Trinidad and Tobago	12	15	3	↑
Uruguay	12	14	2	↑
Venezuela (Bolivarian Republic of)	22	1	-21	↓

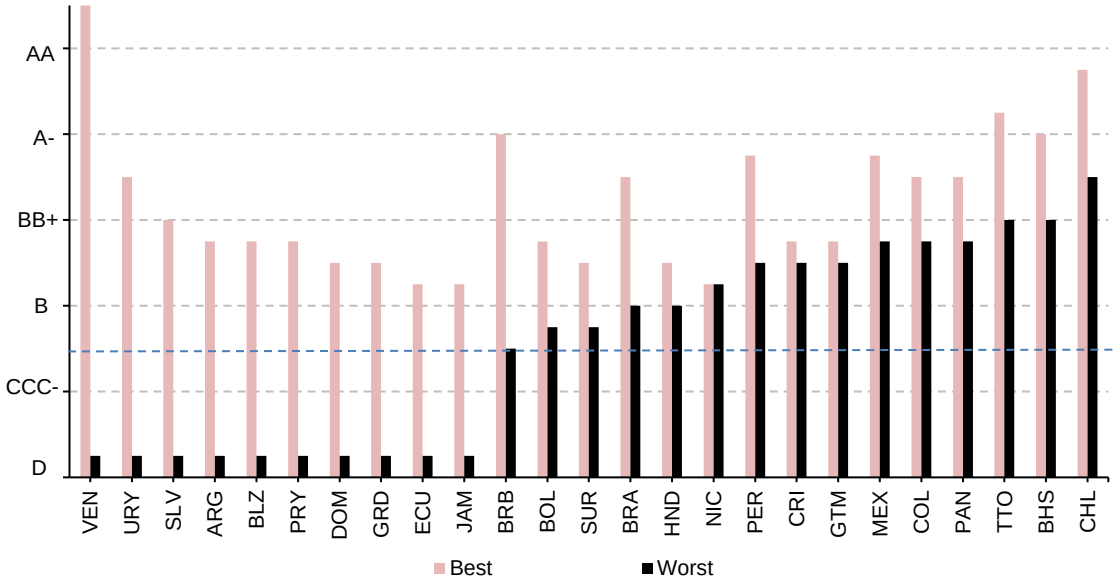
Source: Authors, based on information from Standard & Poor's.

In terms of the best and worst assessment by country, Venezuela had the highest difference between the top and the bottom rating (21 notches), followed by Uruguay (13 notches) and El Salvador (11 notches). The countries that received the lowest ratings were the ones that at some point during the period analyzed defaulted on their debt obligations (ten out of twenty-six rated countries[4], or 38% of all rated sovereigns), even if it were for a short period of time. In the case of Standard & Poor's, this list includes Argentina, Belize, 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, shown as 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 awarded by Standard & Poor's for Latin America and the Caribbean was seven notches.

In the case of Moody's, the data shows that credit ratings in Latin America and the Caribbean improved for twelve sovereigns in the period analyzed, deteriorated for twelve sovereigns and remained the same for two (table 6).

[4] Including Grenada, whose credit rating was removed by Standard & Poor's on 31 October 2014.

Figure 2
Best and worst credit rating assessments by Standard & Poor's



Source: Authors, based on information from Standard & Poor's. The blue line represents the S&P average of the worst credit rating assessments of all countries in the region for the period analyzed (a CCC+ rating).

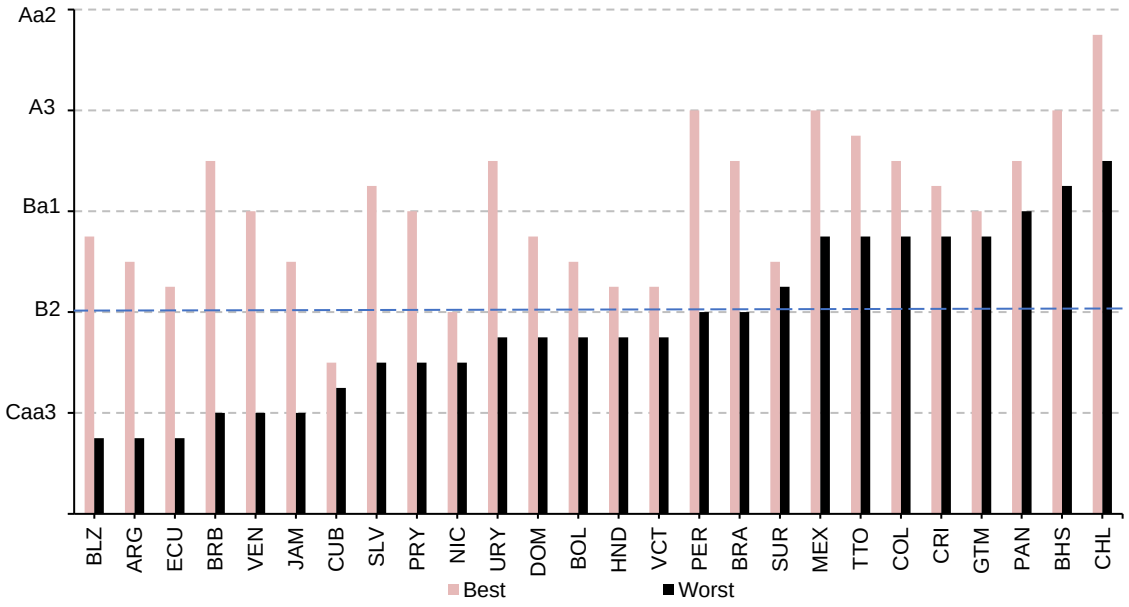
Table 6
Initial and latest credit ratings by Moody's as of 31 December 2017

	Initial	Last	Difference	
Argentina	10	8	-2	↓
Bahamas	16	13	-3	↓
Barbados	11	4	-7	↓
Belize	11	7	-4	↓
Bolivia (Plurinational State of)	9	10	1	↑
Brazil	12	11	-1	↓
Chile	14	19	5	↑
Colombia	12	14	2	↑
Costa Rica	12	11	-1	↓
Cuba	6	5	-1	↓
Dominican Republic	9	10	1	↑
Ecuador	9	7	-2	↓
El Salvador	13	6	-7	↓
Guatemala	11	12	1	↑
Honduras	8	9	1	↑
Jamaica	10	7	-3	↓
Mexico	11	16	5	↑
Nicaragua	8	8	0	-
Panama	12	14	2	↑
Paraguay	8	12	4	↑
Peru	8	16	8	↑
St. Vincent and the Grenadines	9	7	-2	↓
Suriname	9	9	0	-
Trinidad and Tobago	11	12	1	↑
Uruguay	12	14	2	↑
Venezuela (Bolivarian Republic of)	11	4	-7	↓

Source: Authors, based on information from Moody's.

In terms of the best and worst assessment by country, Barbados had the highest difference between the top and the bottom rating (10 notches), followed by Belize, Peru and Venezuela (8 notches). The countries that received the lowest ratings by 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. It 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 awarded by Moody's for Latin America and the Caribbean was five notches on average, compared to seven for Standard & Poor's.

Figure 3
Best and worst credit rating assessments by Moody's



Source: Authors, based on information from Moody's. The blue line represents the Moody's average of the worst credit rating assessments of all countries in the region for the period analyzed (a B2 rating).

In the case of Fitch, the data shows that credit ratings in Latin America and the Caribbean improved for ten sovereigns in the period analyzed, deteriorated for six sovereigns and remained the same for three (table 7).

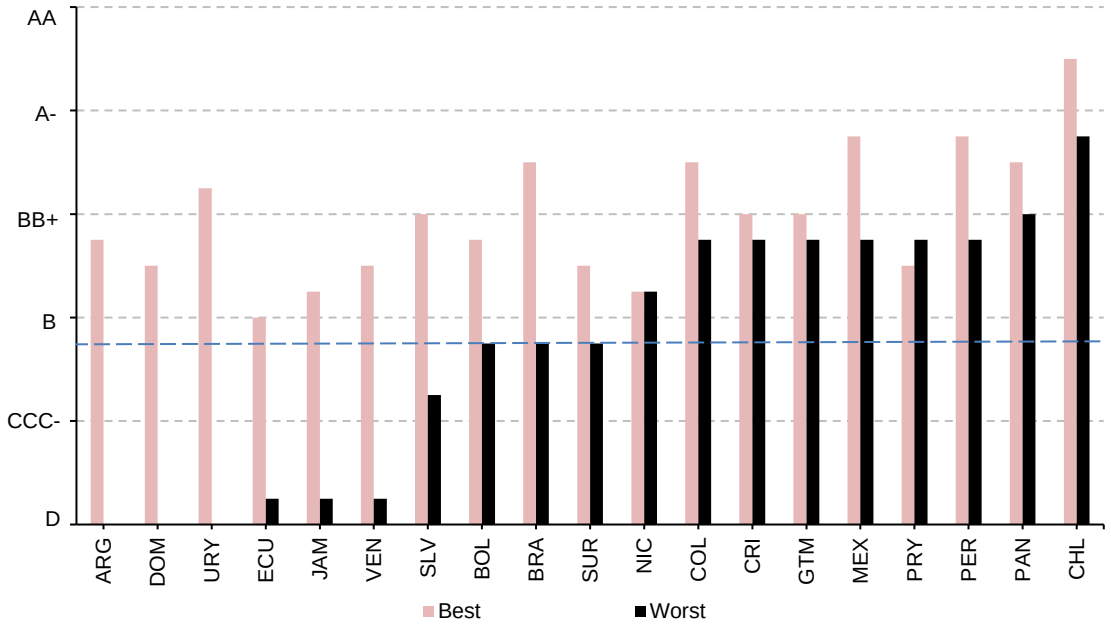
In terms of the best and worst assessment by country, Uruguay had the highest difference between the top and the bottom rating (13 notches), followed by Argentina (11 notches) and the Dominican Republic (10 notches). The countries that received the lowest ratings were the ones that at some point during the period analyzed defaulted on their debt obligations (six out of nineteen rated countries, or 32% of all rated sovereigns), even if it were for a short period of time. In the case of Fitch, this list includes Argentina, Dominican Republic, Ecuador, Jamaica, Uruguay and Venezuela (figure 4). The average of the worst assessments by Fitch for the region was a B-, in the lower non-investment grade category, shown as the dashed line in figure 4. It was one notch higher than the Standard & Poor's average and one notch lower than the Moody's average. The average for the best assessments was a BB+, still in the non-investment grade category and one notch lower than the Standard & Poor's average, but at par with Moody's average. On average, the difference between the top and bottom ratings awarded by Fitch for Latin America and the Caribbean was five notches, at par with Moody's and lower than the Standard & Poor's average of seven notches.

Table 7
Initial and latest credit ratings by Fitch as of 31 December 2017

	Initial	Final	Difference	
Argentina	11	8	-3	↓
Bolivia (Plurinational State of)	7	10	3	↑
Brazil	9	11	2	↑
Chile	15	17	2	↑
Colombia	14	14	0	-
Costa Rica	11	11	0	-
Dominican Republic	9	10	1	↑
Ecuador	6	8	2	↑
El Salvador	11	7	-4	↓
Guatemala	12	11	-1	↓
Jamaica	9	8	-1	↓
Mexico	11	15	4	↑
Nicaragua	9	9	0	-
Panama	12	14	2	↑
Paraguay	10	11	1	↑
Peru	11	15	4	↑
Suriname	8	7	-1	↓
Uruguay	12	13	1	↑
Venezuela (Bolivarian Republic of)	10	1	-9	↓

Source: Authors, based on information from Fitch.

Figure 4
Best and worst credit rating assessments by Fitch



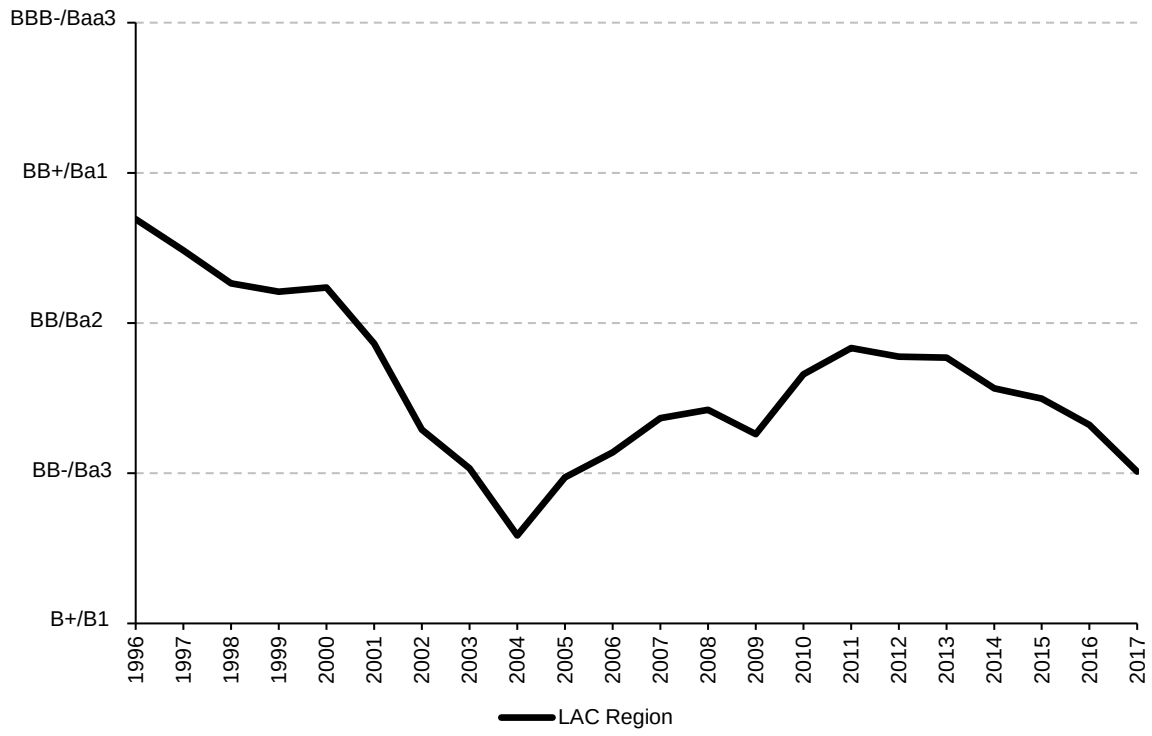
Source: Authors, based on information from Fitch. The blue line represents the Fitch average of the worst credit rating assessments of all countries in the region for the period analyzed (a B- rating).

B. 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 towards improved credit quality in the 2000s, especially after 2003. By the end of 2017, many countries in the region had received an investment-grade rating.

Sovereign credit quality deteriorated during the global financial crisis of 2008, but resumed its ascendant trend soon afterwards, until reaching a peak in 2011 (when the commodities supercycle also reached a peak). The credit quality of sovereigns in the Latin American and Caribbean region remained generally stable until 2013, when there was a reversal in direction towards a downward trend, which continued through 2017 (figure 5).

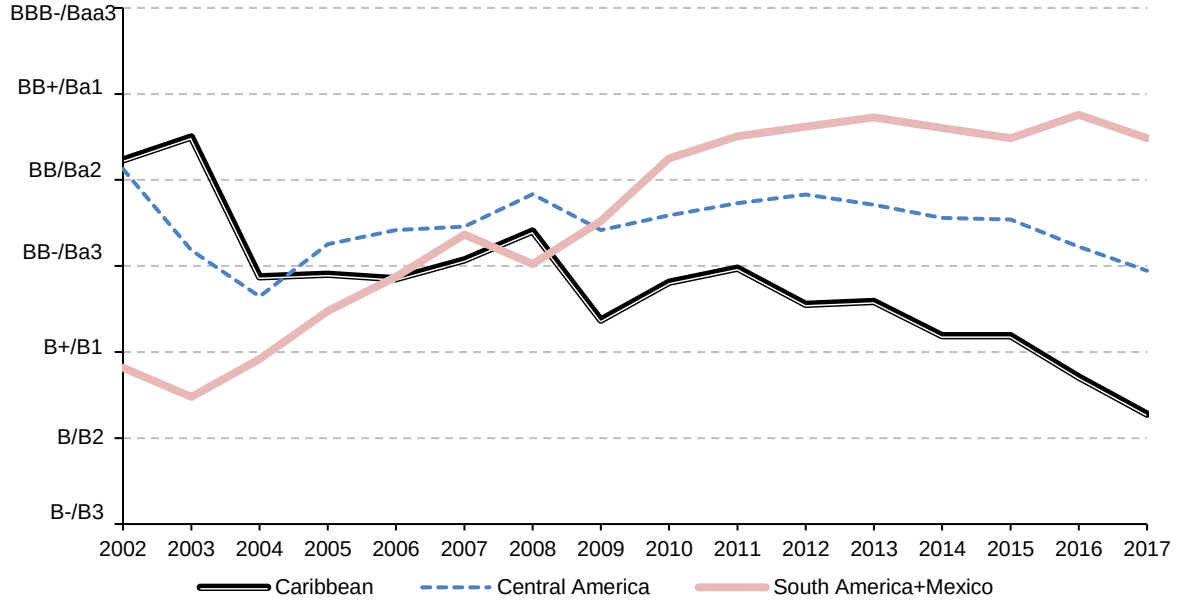
Figure 5
The evolution of credit ratings in Latin America and the Caribbean
(Average credit rating: Standard & Poor's, Moody's and Fitch)



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

For South America and Mexico, credit quality recorded an upward trend, with upgrades outpacing downgrades on a yearly basis, from 2003 until 2013. 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, good economic policies, including improvement in key vulnerability indicators, and strong economic growth led to the steady and continued trend of credit upgrades in the subregion in the period. Since 2013, however, the number of downgrades has increased in tandem with increasing domestic economic difficulties and a more adverse external backdrop, but on average creditworthiness remains a lot higher than in 2003 (figure 6).

Figure 6
Average credit ratings by subregion, 2002-2012
(Average credit rating: Standard & Poor's, Moody's and Fitch)



Source: Authors, based on data from Standard & Poor's, Moody's and Fitch.
Notes: South America includes Argentina, Bolivia, Brazil, Chile, Colombia, Paraguay, Peru, Uruguay and Venezuela (R. P. of). Following Bustillo and Velloso (2013), Mexico is added to this group of countries, as its access to international bond markets has followed similar patterns. For the purposes of this study, Central America includes Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and Panama; and the Caribbean includes the Bahamas, Barbados, Belize, Jamaica and Trinidad & Tobago.

Overall, credit ratings for the Caribbean and Central American countries did not follow the same trajectory. While credit ratings for South America and Mexico suffered a negative impact during the global financial crisis, they recovered sooner and resumed an upward trend more promptly. 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 Caribbean, credit ratings have been on a downward trend since the mid-1990s.[5] Most Caribbean countries also suffered downgrades following the onset of the 2008 financial crisis, but as of the end of 2017 most had not yet recovered their previous standing (table 8). 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 current 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), 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. In May 2013, the U.S. Federal Reserve announced that it would start "tapering off" its quantitative easing program later in the year, which compounded the impact of the end of the 2000s commodity price boom and subsequent deterioration in the domestic economic situation of commodity-exporter countries, leading to a reversal in the upward trend in credit ratings. While rating upgrades in recent years were largely driven by increased resilience to external shocks, improved government debt profiles, and strong economic performances, CRAs have suggested that additional upgrades for countries already in the investment grade category will depend on the strengthening of institutions in general, particularly credible institutional arrangements that reinforce fiscal management.

[5] For the longer-term trend in Caribbean credit ratings see Bustillo, Velloso, Dookeran and Perrotti (2018), p.29-32.

Table 8
Credit ratings by subregion: 2002, 2007, 2012 and 2017

	S&P				Moody's				Fitch			
	2002	2007	2012	2017	2002	2007	2012	2017	2002	2007	2012	2017
South America + Mexico												
Argentina	SD	B+	B-	B+	Ca	B3	B3	B2	RD	RD	CC	B
Bolivia (Plurinational State of)	B+	B-	BB-	BB	B1	Caa1	Ba3	Ba3	n/a	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	n/a	n/a	n/a	BB
Peru	BB-	BB+	BBB	BBB+	Ba3	Ba2	Baa2	A3	BB-	BB+	BBB	BBB+
Uruguay	B-	BB-	BBB-	BBB	B3	B1	Baa3	Baa2	B	BB-	BB+	BBB-
Venezuela (Bolivarian Republic of)	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
Dominican Republic	BB-	B+	B+	BB-	Ba2	B2	B1	Ba3	n/a	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	n/a	BB+	BB+	BB
Honduras	n/a	n/a	B+	BB-	B2	B2	B2	B1	n/a	n/a	n/a	n/a
Nicaragua	n/a	n/a	n/a	B+	B2	Caa1	B3	B2	n/a	n/a	n/a	B+
Panama	BB	BB	BBB	BBB	Ba1	Ba1	Baa2	Baa2	BB+	BB+	BBB	BBB
Caribbean												
Bahamas	n/a	A-	BBB	BB+	A3	A3	A3	Baa3	N/A	N/A	N/A	N/A
Barbados	A-	BBB+	BB+	CCC+	Baa2	Baa2	Baa3	Caa3	N/A	N/A	N/A	N/A
Belize	B+	B	SD	B-	Ba2	Caa1	Ca	B3	N/A	N/A	N/A	N/A
Jamaica	B+	B	B-	B	Ba3	B1	B3	B3	N/A	B+	B-	B
Suriname	B-	B+	BB-	B	N/A	B1	Ba3	B1	N/A	B	BB-	B-
St Vincent and the Grenadines	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B3	N/A	N/A	N/A	N/A
Trinidad &Tobago	BBB-	A-	A	BBB+	Baa3	Baa1	Baa1	Ba1	N/A	N/A	N/A	N/A

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

C. Creditworthiness and financing costs

The list of investment-grade countries in the LAC 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,[6] Colombia, Mexico, Panama, Peru, and Trinidad and Tobago). Uruguay received an investment-grade in 2012, increasing this number to eleven. Investment-grade status reduces financing costs significantly by improving market expectations and encouraging greater inflows from a broader and more diversified investor base. Reaching investment grade can lower sovereign spreads significantly (Jaramillo and Tejada, 2011).

By the end of 2017 there were only eight investment-grade sovereigns in the region, however, following Barbados' loss of investment-grade status in 2012, Costa Rica's in 2013, and Brazil's at the end of 2015. Of these eight sovereigns, two were on the way of also losing their investment-grade status. The Bahamas lost the investment-grade rating from Standard & Poor's in December 2016 but kept a lower investment-grade from Moody's, and Trinidad & Tobago lost the investment grade from Moody's in April 2017 but kept a lower investment grade from Standard & Poor's.

There is a negative relationship between credit ratings and the level of 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 (2002-2017). The figure shows that the number of investment-grade countries in Latin America and the Caribbean increased significantly in the 2000s. It also shows that 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. Because of its high bond spreads, Argentina was removed from the 2002 sample in figure 7.

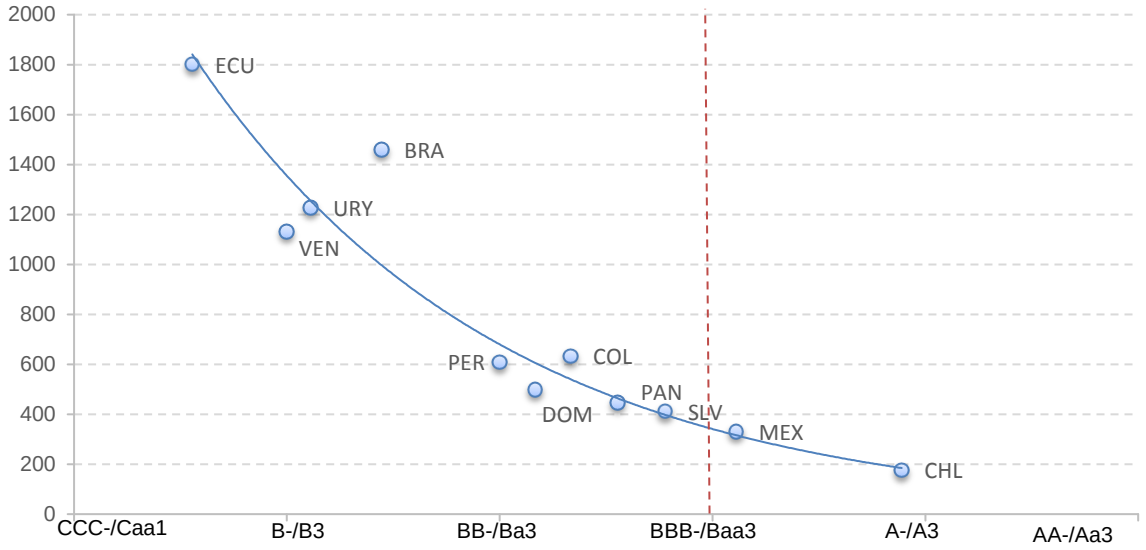
More countries are included in the 2017 sample, as JPMorgan added Belize, Jamaica and Trinidad and Tobago to its EMBIG index in 2007, Costa Rica and Guatemala in 2012, and Bolivia and Paraguay in 2013. Confirming that spreads tend to increase substantially for countries with speculative credit ratings, by the end of 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 in November. Belize's spreads, after reaching a peak of almost 2,000 basis points in December 2016, before undergoing its third debt restructuring in a period of 10 years, were at 771 basis points at the end of 2017. After reaching a deal with creditors in March 2017, Belize's spreads declined to less than 1,000 basis points. Because of their high bond spreads, both Belize and Venezuela were removed from the 2017 sample in figure 7.

The gap in credit quality between Latin American and developed markets narrowed during the 2003-2012 period, as credit quality improved in Latin American economies and deteriorated in developed countries. The upgrades that took place in the region in 2011 contrasted with the situation in Europe and the United States. For example, in 2011 the United States faced the first-ever downgrade of its credit rating, while Standard & Poor's, Moody's and Fitch all raised their foreign- and local-currency ratings for Brazil to a higher investment-grade category to reflect the government's strong finances. However, this trend towards a narrower gap has stalled since 2013, as the economic situation in developed countries has improved and the domestic situation in the Latin America and Caribbean region deteriorated. As mentioned above, Brazil lost its investment grade at the end of 2015.

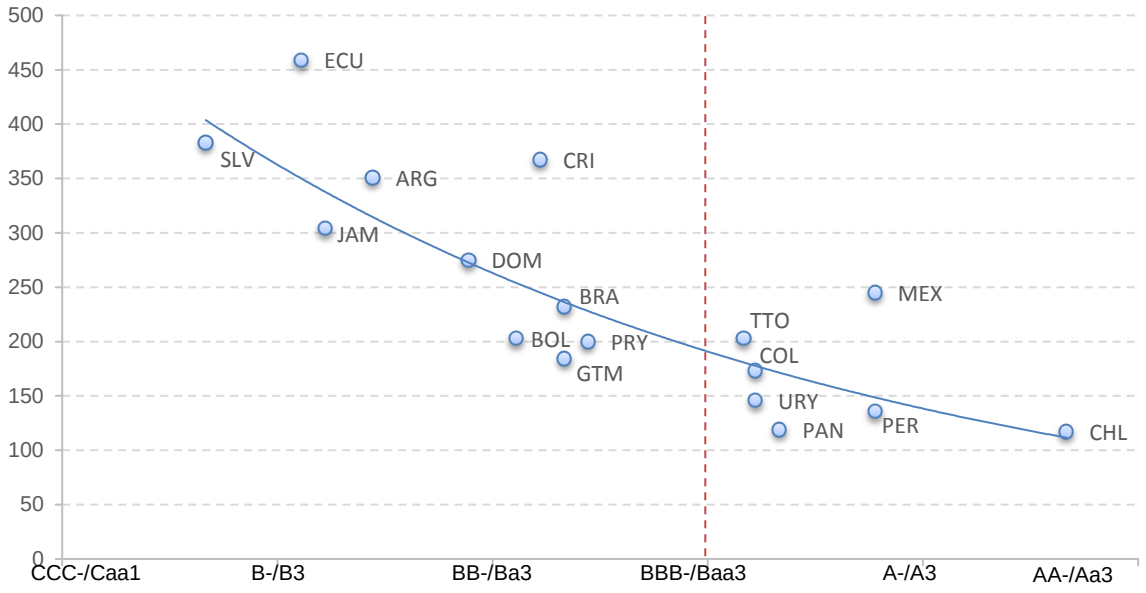
[6] At the end of 2011, Costa Rica had an investment grade only from Moody's, and a non-investment grade from Standard & Poor's and Fitch. From an investor's perspective, however, a sovereign must be rated at 'BBB-' or higher by at least two of the three main credit rating agencies to be considered as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

Figure 7
Latin America and the Caribbean: sovereign credit ratings and spreads in 2002 and 2017
(Average credit rating: Standard & Poor's, Moody's and Fitch, spreads in basis points)

2002 (without Argentina)



2017 (without Belize and Venezuela (Bolivarian Republic of))



Source: Authors, based on data from Standard & Poor's, Moody's, Fitch and JPMorgan EMBIG Index.
Notes:
a. The horizontal axis corresponds to average sovereign credit ratings; the vertical axis shows EMBIG spreads in basis points. The dashed-vertical line indicates the investment-grade threshold.
b. In 2002, the slope of the curve is 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 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.

II. Impact of credit rating changes on debt spreads

Recent historic trends indicate that during most of the 2000s, external economic conditions were very favorable to emerging markets and the LAC region. In particular, the emergence of China as an economic and geopolitical power translated into increased demand for commodities and into a boom in commodity prices that benefitted the region's commodity exporters. However, the end of the commodity prices' supercycle has had an impact on the economies of the region ever since it reached a peak in mid-2011. Since then, the external financial scenario has become more volatile, and the upward trend in LAC creditworthiness has also stalled. In 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 trend in LAC creditworthiness started to reverse direction, as seen in the previous chapter. Looking forward, as the Fed and other global central banks continue to increase their interest rates and reduce their balance sheets, tighter global liquidity is expected, thus improvements in credit quality should be harder to achieve.

Sovereign credit ratings are very important for economies whose access to international capital markets varies greatly, as in the case of emerging market (EM) countries. They have increased EM countries' access to international capital markets and enhanced their ability to raise funds at a lower cost. While sovereign 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 a revision in investors' expectations (Grande and Parsley, 2004). Thus, given the nature of sovereign ratings as "facilitators" to emerging markets' access to international capital markets and their influence on market decisions, capital flows tend to respond to rating changes. For example, sovereign downgrades are frequently associated with outflows of capital from the country being downgraded. Flows around downgrades are 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. During the late 1990s CRAs came under severe scrutiny as the financial crises during the period resulted in significant capital outflows and "sudden stops" (Calvo, 1998). The failure of CRAs to predict these crises, and their downgrading of sovereign ratings after the fact, led to the perception that they may have aggravated the crises. The CRAs came under scrutiny once again following the 2008 financial crisis.

This chapter focuses on sovereign credit rating changes and their impact on the LAC region's cost of borrowing abroad, i.e. the price response to these changes. More precisely, it observes the impact of upgrades and downgrades in LAC sovereign credit ratings from 2003 to 2017 on the behavior of sovereign bond spreads as measured by the JPMorgan Emerging Market Bond Index Global (EMBIG), using an

event study methodology, which has the purpose of isolating the incremental impact of an event on a variable of interest besides the normal performance of that variable (see annex A for a description of the methodology). An event is defined as a credit rating change, with the two possible outcomes being an upgrade (up) or a downgrade (down). This chapter examines whether upgrades and downgrades have an asymmetric impact on bond spreads; whether credit rating changes have different impacts depending on the subregion; and whether the impact varies when looking at three different time periods: 2003-2007, 2008-2012, and 2013-2017.

Studies about the impact of credit ratings on financial variables are part of a vast field, with several having used an event study methodology and/or looked at the impact of credit ratings on sovereign bond spreads in particular. In their seminal paper, Cantor and Packer (1996) address the important question of how much impact credit ratings may have on sovereign borrowing costs. Their methodology includes a cross-section dataset and different econometric tools (regressions and event study) which are applied to just one day (29 September 1995). They find that rating announcements have immediate effects on market pricing for non-investment grade bonds.

Sy (2001) runs a panel regression model for seventeen emerging market countries where he estimates the relation between sovereign risk and a set of independent variables (among them: credit ratings, a measure of currency risk, and liquidity conditions) with monthly data from January 1994 to April 2001. The author highlights that market views are represented by bond spreads while economic fundamentals are captured by ratings.[7] He finds a negative relationship between sovereign spreads and credit ratings, with higher ratings being associated with lower spreads, an interrelation that has strengthened over the years.

Kräussl (2003) analyzes the role of credit rating agencies in international financial markets, particularly whether sovereign credit ratings have an impact on financial stability in emerging market economies. To perform the study Kräussl defines a Speculative Market Index (SMI) to be used as a dependent variable in a panel regression. His null hypothesis is that CRAs add value, meanwhile the alternative hypothesis represents a confirmation of the Efficiency Market Hypothesis. He also carries out an event study analysis with daily data from 1 January 1997 to 31 December 2000. Among his findings is that credit rating agencies have substantial influence on the size and volatility of emerging markets lending. Moreover, his 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 et al. (2004) use an event study framework to analyze the impact of ratings on credit default swaps (CDS) and bond yields in a daily frequency between 5 January 1998 and 24 May 2002. A sovereign or corporate's credit default swap spread is the cost per annum for protection against a default. Specifically, the authors test the extent to which credit rating announcements by Moody's are anticipated by participants in the CDS market. The authors find CDS spread changes tend to anticipate negative rating announcements, particularly when extreme declines in credit quality happen within a short period of time. Either credit spread changes or credit spread levels provide helpful information in estimating the probability of negative credit rating changes. The results for positive rating events were much less significant than the results for negative rating events.

Gaillard (2009) analyzes the correlation between EMBIG spreads and ratings of the three main CRAs, using monthly data for the period of December 1993 to February 2007. The estimation is done using a univariate model of EMBIG spreads to determine differences between the market and the three main agencies. The author uses an unbalanced panel data estimation of log spreads on Standard & Poor's, Moody's and Fitch's ratings. Focusing on the specific relationship between the market and each agency, one of the author's conclusions is that for the three agencies, there is an asymmetric adjustment of ratings: they are more prone to downgrade following excessive high spreads and spread increases than upgrade following excessive low spreads and spread decreases.

[7] Carvallo et all. (2008), however, remark that bond spreads and ratings are both measures of the same – but not observed – fundamentals.

Ismailescu and Kazemi (2010) perform an event study analysis and multivariate regression to check for the effects of sovereign credit ratings change announcements on CDS spreads, and their spillover effects on other emerging economies' CDS premiums. They find that positive events have a greater impact on CDS markets in the two-day period surrounding the event and are more likely to spill over to other emerging countries. Alternatively, CDS markets anticipate negative events, and previous changes in premiums can be used to estimate the probability of a negative credit event (the information contained in credit downgrades is already incorporated in CDS spreads by the time the rating announcement is released).

Afonso et. al. (2012) use daily data (from 2 January 1995 to 10 October 2010) to perform an event study analysis about the impact on government yield spreads before and after announcements from rating agencies in Europe. They find significant response of government's bond yield spreads to changes in rating notations and outlook, particularly in the case of negative announcements.

In this paper, we apply an event study methodology to estimate the impact of credit rating changes on sovereign bond spreads, performing a variety of estimations to assess the impact of credit rating changes over a measure of country risk (i.e. EMBIG). In terms of the available literature, it is an effort to focus the analysis entirely on Latin America and the Caribbean, including seventeen countries and more than fifteen years of data collection, and to better understand the characteristics of the region and its subregions regarding the trends in credit ratings in the past fifteen years.

Table 9
Impact of credit ratings on bond spreads: literature comparison (selected papers)

	Cantor and Packer (1996)	Sy (2001)	Kräussl (2003)	Hull et al. (2004)
Estimated Relationship	The authors study the determinants and impact of the sovereign credit ratings assigned by the two leading U.S. agencies, Moody's and Standard & Poor's.	Relationship between emerging market sovereign spreads and credit ratings.	Role of credit rating agencies in international financial markets, particularly whether sovereign credit ratings have an impact on the financial stability in emerging market economies.	Relationship between credit default swaps and bond yield.
Estimation Methodology	Event Study and Cross section regression	Panel Regression	Event Study - Panel regression	Event Study - Logistic Models
Data Sample	29-Sep-95	January 1994 - April 2001	1 January 1997 to 31 December 2000	5 January 1998 to 24 May 2002
Data Frequency	Daily	Monthly	Daily	Daily
Main Findings	• Authors find that rating announcements have immediate effects on market pricing for non-investment-grade issues. • Credit ratings "appeared to have some independent influence on yields over and above their correlation with other publicly available information" (p.37)	• Negative association between sovereign spreads and ratings, with higher ratings being associated with lower spreads. This relationship has strengthened over the years. • Dispersion of spreads – as measured by the coefficient of variation – for similarly rated countries increased during the 1998 crisis.	• Findings indicate that credit rating agencies have substantial influence on the size and volatility of emerging markets lending. • Empirical findings are significantly stronger in the case of government's downgrades and negative imminent sovereign credit rating actions such as credit watches and rating outlooks than positive adjustments by the credit rating agencies.	• In relation to CDS changes conditional on a ratings announcement, authors find that reviews for downgrade contain significant information, but downgrades and negative outlooks do not. • Either credit spread changes or credit spread levels provide helpful information in estimating the probability of negative credit rating changes.

Table 9 (conclusion)

	Gaillard (2009b)	Ismailescu & Hossein (2010)	Afonso et al. (2011)
Estimated Relationship	Interactions between EMBIG spread and credit rating agencies	Effects of sovereign credit rating change announcements on CDS spreads, and their spillover effects on other emerging economies' CDS premiums.	Impact of rating events on government yield and credit default swaps spreads
Estimation Methodology	Panel Regression	Event Study, and Multivariate Regression	Event Study
Data Sample	December 1993 to February 2007	2 January 2001 to 22 April 2009	2 January 1995 to 10 October 2010
Data Frequency	Monthly	Daily	Daily
Main Findings	• Ratings are stable. • Asymmetric adjustment: more prone to downgrade following excessively high spreads and spreads increases than to upgrade following excessively low spreads and spread decreases. • Reactions of spreads to rating changes reveal that S&P downgrades and Moody's upgrades have the most significant impact on spread movements.	• Rating announcements appear to reveal new information that affects CDS spreads. More specifically, premiums display a stronger reaction to positive announcements, but respond weakly to negative events. • The latter indicates that the information contained in credit downgrades is already incorporated in CDS spreads by the time the rating announcement is released. • Investors may be able to use changes in CDS spreads to estimate the probability of a rating event: changes in CDS premiums are particularly useful in estimating the probability of negative events. • Negative credit rating announcements have no impact on CDS spreads of other emerging economies. • The spillover effect of positive events, however, is only marginally significant and its impact is considerably reduced by prior rating events.	• Significant responses of government bond yield spreads to changes in rating notations and outlook, particularly in the case of negative announcements; • Announcements are not anticipated at 1-2 months horizon but there is bidirectional causality between ratings and spreads within 1-2 weeks; • Spillover effects especially from lower rated countries to higher rated countries; • Persistence of effects for recently downgraded countries.

Source: Elaborated by the authors.

A. Dataset and descriptive statistics

We focus on events that imply an effective rating change (a downgrade or an upgrade), putting away revisions and outlooks to avoid potential bias through contamination or clustering effects.[8] The methodology assumes that different events are independent and do not overlap (zero covariance). Our dataset contains credit rating changes from Standard & Poor's, Moody's and Fitch, and sovereign country risk as measured by JPMorgan EMBIG spreads, which represents the cost of borrowing abroad. The sample contains seventeen LAC countries,[9] for which data – both on credit ratings and EMBIG spreads – is available. The data frequency is daily, and the period analyzed is from 1 January 2003 to 31 December 2017. The first observation for each country varies because of EMBIG data availability, but all countries have the final value in the last business day of December 2017 (see table 10).

Table 10
Estimation time span by country

Country	First observation	Country	First observation
Argentina	1/2/2003	Guatemala	6/29/2012
Belize	5/3/2007	Jamaica	10/31/2007
Brazil	1/2/2003	Mexico	1/2/2003
Chile	1/2/2003	Panama	1/2/2003
Colombia	1/2/2003	Peru	1/2/2003
Costa Rica	7/31/2012	Trinidad and Tobago	5/31/2007
Dominican Republic	1/2/2003	Uruguay	1/2/2003
Ecuador	1/2/2003	Venezuela (Bolivarian Republic of)	1/2/2003
El Salvador	1/2/2003		

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

Table 11
EMBIG spreads (in basis points) by country: descriptive statistics

Country	Number of observations	Mean	Standard Deviation	Min.	Max.
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 (Bolivarian Republic of)	3,749	1,241	904	161	4,982

Source: Authors based on collected data from JPMorgan Emerging Market Bond Index Global.
Note: Data collected for the time span specified on table 10.

[8] Similar results held for outlook revisions, but they were not always statistically significant.
[9] They include: Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, and Venezuela (Bolivarian Republic of).

The behavior of EMBIG spreads during the period analyzed varies widely by country, highlighting differences in volatility. On one end, Argentina, Venezuela and Ecuador show the highest volatility (as measured by the standard deviation) over the 2003-2017 period, and on the other end, Guatemala, Chile and Mexico show the lowest (table 11).

There were 280 credit rating changes in the period analyzed, with upgrades accounting for more than half (155) of the total (table 12). Standard & Poor's accounts for the largest number of events (122 or 44% of total credit changes), followed by Fitch (82 or 29%) and Moody's (76 or 27%). During the period analyzed, 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. In terms of shares (table 13) Standard & Poor's has the biggest share of downgrades (49% of total downgrades), followed by Fitch (29%) and Moody's (22%). In the case of upgrades, Standard & Poor's also has the biggest share (40%) of total upgrades, followed by Moody's (31%) and Fitch (29%).

Table 12
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 based on collected data from Standard & Poor's, Moody's and Fitch.
Note: Data collected for the time span specified on table 10.

Table 13
Share of credit rating upgrades and downgrades by agency

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

Source: Authors based on collected data from Standard & Poor's, Moody's and Fitch.
Note: Data collected for the time span specified on table 10.

Table 14
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 (B. R. of)	9	19	28
Total	**155**	**125**	**280**

Source: Authors based on collected data from Standard & Poor's, Moody's and Fitch.
Note: Data collected for the time span specified on table 10.
See Annex 3 for number of credit rating changes by country for each of the CRAs.

Venezuela, Ecuador and Uruguay are the countries with the most changes in credit ratings in the relevant period (table 14). On the other hand, Guatemala, Costa Rica, and Trinidad and Tobago are the countries with least amount of credit rating changes. Uruguay (20), Brazil (17), and Ecuador (17) had the biggest number of upgrades in the period, while Venezuela (19), El Salvador (19) and the Dominican Republic (14) had the most downgrades.

B. Methodology and results

For the estimation of the impact of a credit rating change on EMBIG spreads we used the event study methodology, which is described in detail in annex A. According to it, and following Campbell (1996), 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 should be expected if the event (i.e. a change in a credit rating) did not take place:

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

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

Using an event window of 30 days[10] and estimating normal returns according to the Capital Asset Pricing Model (CAPM), our findings (table 15) show 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 bigger for downgrades than for upgrades, confirming the asymmetry observed in the literature. The parameters show statistical significance and congruence with ex-ante sign expectation.

Table 15
Event study results

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	73	13.87***	positive
Rating downgrade Moody's	130	41.85***	positive
Rating downgrade Fitch	105	31.63***	positive
Rating upgrade Standard & Poor's	-18	-33.37***	negative
Rating upgrade Moody's	-56	-12.83***	negative
Rating upgrade Fitch	-8	-17.83***	negative
Downgrade - Simple Average	**103**		
Upgrade - Simple Average	**-27**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

The cumulative average of the impact following rating downgrades (upgrades) was an increase (decrease) of 103 (27) basis points for the EMBIG when considering a simple average of the three credit rating agencies' ratings. However, when looking by agency level, results vary from 130 to 73 basis points impact for a credit downgrade, and from -56 to -8 basis points impact for a credit upgrade, which would suggest that investors react differently depending on the CRA assessment, perhaps reacting more forcefully to the first change in a sovereign credit rating, which may later be followed by further changes and/or by rating changes by other agencies. Further research is needed to better understand these reactions.

To check for robustness of the above results, we conducted an exercise with a different technique for estimating normal returns. In this case we considered as normal return 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 15: all estimations are statistically significant, with the expected ex-ante signs. In addition, the impact of rating changes on EMBIG spreads are almost of the same magnitude (see table 16).

[10] For results using other estimation windows see annex B.

Table 16
Alternative normal return

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	66	12.49***	positive
Rating downgrade Moody's	136	43.93***	positive
Rating downgrade Fitch	99	29.67***	positive
Rating upgrade Standard & Poor's	-19	-35.33***	negative
Rating upgrade Moody's	-64	-14.83***	negative
Rating upgrade Fitch	-14	-30.72***	negative
Downgrade - Simple Average	**100**		
Upgrade - Simple Average	**-32**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

1. Results by subregion

Trends in credit quality varied within Latin America and the Caribbean. For South America and Mexico, credit quality was on an upward trend since 2003, as seen in the previous chapter, 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 look at estimations by subregional level (South America and Mexico, Central America, and the Caribbean).

Our findings suggest that the impact of credit rating changes on EMBIG spreads vary by subregion. The biggest impact on sovereign spreads after a downgrade is observed in South America + Mexico. A tentative explanation may be the fact that credit quality, as seen in the previous chapter, was on an upward trend in recent years in this subregion, thus a reversal in direction would have a bigger impact on risk premia and on markets' confidence. In this subregion, the increase in risk premia after a downgrade is, on average, more than seven times higher than the impact after an upgrade (table 17). At the individual agency level, the subregion presents more volatility in the results than the other two subregions. Further analysis is required to understand why the impact on spreads from a downgrade by Moody's, for example, is higher than by other agencies.

In the Caribbean, the impact of both downgrades and upgrades is more balanced, with downgrades having a slightly bigger impact on risk premia (table 18). In Central America, results suggest credit rating changes have had little impact on sovereign spreads (table 19).

Table 17
Results by subregion: South America + Mexico

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	101	10.68***	positive
Rating downgrade Moody's	263	38.09***	positive
Rating downgrade Fitch	196	30.08***	positive
Rating upgrade Standard & Poor's	-7	-7.9***	negative
Rating upgrade Moody's	-63	-8.98***	negative
Rating upgrade Fitch	-6	-11.1***	negative
Downgrade - Simple Average	187		
Upgrade - Simple Average	-25		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

Table 18
Results by subregion: Caribbean

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	86	8.11***	positive
Rating downgrade Moody's	61	17.34***	positive
Rating downgrade Fitch	41	11.57***	positive
Rating upgrade Standard & Poor's	-48	-69.29***	negative
Rating upgrade Moody's	-68	-90.84***	negative
Rating upgrade Fitch	-13	-24.71***	negative
Downgrade - Simple Average	**63**		
Upgrade - Simple Average	**-43**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

Table 19
Results by subregion: Central America

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	13	6.96***	positive
Rating downgrade Moody's	1	2.12**	positive
Rating downgrade Fitch	7	6.50***	positive
Rating upgrade Standard & Poor's	-10	-7.04***	negative
Rating upgrade Moody's	-5	-1.73**	negative
Rating upgrade Fitch	-16	-9.52***	negative
Downgrade - Simple Average	**7**		
Upgrade - Simple Average	**-10**		

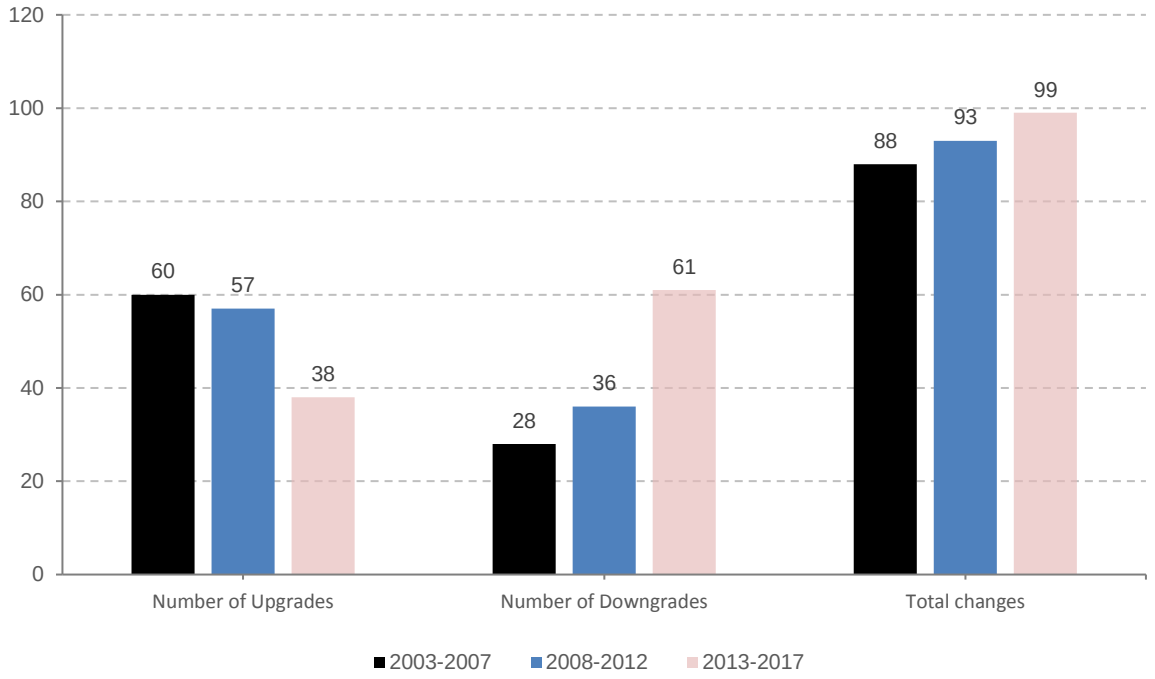
Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

2. Results by time-period

In this section we examine whether the impact of credit rating changes on sovereign EMBIG spreads may vary depending on the time-period. Three different time periods are considered: 2003–2007; 2008–2012; and 2013–2017. The first – from 1 January 2003 to 31 December 2007 – accounts for years of economic and fiscal boom in a major number of countries in Latin America and the Caribbean. The second – from 1 January 2008 to 31 December 2012 – is a period of worse economic and social performance for the region, due in part to the global financial crisis of 2008-2009, which adversely affected fiscal balances in several countries and led to a sequence of credit rating downgrades. The last – 1 January 2013 to 31 December 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 99 rating changes are observed, compared to 88 changes in the first period, and 93 in the second. Most downgrades happened during the last (2013-2017) period (61 of 125 downgrades, or about 50% of total downgrades), while upgrades mainly took place in the first two periods (with 117 of 155 upgrades, or 75% of total upgrades), particularly in the first (figure 8). As shown in the previous chapter, after reaching a peak in 2011, the upward trend in LAC credit quality stalled at first and beginning in 2013 it started to reverse direction.

Figure 8
Number of credit rating changes in Latin America and the Caribbean (2003-2017)
(Number of credit ratings, including upgrades and downgrades, by sub-periods)



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

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 20 and 21). This is in contrast with the last period when the estimated impact on sovereign spreads from credit rating changes by different agencies appear to be more convergent (table 22).

Table 20
Results by time-period: 2003-2007

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	65	10.37***	positive
Rating downgrade Moody's	38	6.93***	positive
Rating downgrade Fitch	79	38.28***	positive
Rating upgrade Standard & Poor's	-2	-1.41*	negative
Rating upgrade Moody's	-110	-8.85***	negative
Rating upgrade Fitch	-15	-22.00***	negative
Downgrade - Simple Average	**61**		
Upgrade - Simple Average	**-42**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

Table 21
Results by time-period: 2008-2012

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	80	11.13***	positive
Rating downgrade Moody's	189	41.10***	positive
Rating downgrade Fitch	192	43.87***	positive
Rating upgrade Standard & Poor's	-19	-33.67***	negative
Rating upgrade Moody's	-21	-24.22***	negative
Rating upgrade Fitch	-6	-10.46***	negative
Downgrade - Simple Average	**153**		
Upgrade - Simple Average	**-15**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

Table 22
Results by time-period: 2013-2017

Event Type	Average cumulative basis points change in spreads	Z-statistic	Ex-ante sign expectation
Rating downgrade Standard & Poor's	28	3.42***	positive
Rating downgrade Moody's	15	2.60***	positive
Rating downgrade Fitch	31	4.06***	positive
Rating upgrade Standard & Poor's	-21	-50.46***	negative
Rating upgrade Moody's	-17	-22.15***	negative
Rating upgrade Fitch	-7	-16.90***	negative
Downgrade - Simple Average	**25**		
Upgrade - Simple Average	**-15**		

Source: Authors' estimations.
Note: Each * represents one tailed significance level at 10%, 5% and 1%, respectively.

On average, the biggest impact on spreads due to a downgrade is observed in 2008–2012, which followed a period of boom when credit quality in the region was on the rise and global economic conditions were extremely favorable to emerging markets. The good performance of emerging markets during the boom years raised speculation that emerging markets had "decoupled" from developments in developed markets.[11] A downgrade in the 2008–2012 period was thus out of step with the previous underlying trend, and the widespread belief that emerging markets would not be seriously affected by developed economies' woes. The impact of a sovereign downgrade on sovereign spreads was thus stronger, as it broke with trend and had a component of surprise, revealing that the downgraded sovereign faced important shortcomings.

The lowest impact is observed during 2013–2017, when most of the downgrades took place. The fact that the upward trend in credit quality had already reached 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 time-periods show (except for Moody's in the 2003–2007 period) a similar impact after upgrades, with values close or below -20 basis points.

[11] Decoupling takes place when two different asset classes that typically rise and fall together move in opposite directions, such as one increasing and the other decreasing. The notion that the health of emerging markets was no longer determined by the ups-and-downs in developed economies, or the "decoupling" debate, arose towards the end of our first time-period.

III. Final thoughts

The history of Latin American and Caribbean sovereign credit ratings shows that the 1990s witnessed a sharp increase in the number of rated sovereigns, which continued in the 2000s and beyond, although at a slower pace. The evolution of credit ratings in the region point to an improvement in credit quality from 2003 to 2013, a period when a sharp compression in bond spreads is also observed. Since then there has been a reversal in direction, and sovereign creditworthiness has been slowly deteriorating. Most of the improvement was explained by better credit quality in South America and Mexico, while in the Caribbean creditworthiness has been on a downward trend since the mid-1990s. In Central America, credit quality has not changed as much as in the other two subregions.

In terms of the available literature, this paper is an effort to focus the analysis entirely on Latin America and the Caribbean, bringing together the history of sovereign ratings in the region from when they were first assigned to December 2017. Applying an event study methodology to estimate the impact of credit rating changes on sovereign bond spreads, we performed a variety of estimations to assess the impact of credit rating changes over a measure of country risk (i.e. EMBIG). The event study analysis includes seventeen LAC countries and more than fifteen years of data collection, in addition to using the CAPM as the benchmark model for the estimation of normal returns. We find that, consistent with a major part of the literature on the subject, there is an asymmetric impact on sovereign bond spreads between upgrades and downgrades, with credit rating downgrades showing a much bigger impact than upgrades.

Besides an asymmetric impact during the analyzed period, there are additional interesting findings. After clustering the data in three subregions we observe that the impact of credit rating changes on sovereign spreads vary by subregion. The biggest impact following a downgrade is observed in South America and Mexico, where credit quality improved the most in the period analyzed. In the Caribbean, the impact of both downgrades and upgrades is more balanced, with downgrades having a slightly bigger impact on risk premia. In Central America, results suggest credit rating changes have had little impact on sovereign spreads.

When the dataset is divided in three different periods of five years, the impact of credit rating changes on sovereign spreads vary by time-period. The biggest impact on sovereign spreads after a downgrade is observed in the 2008–2012 period, which follows a period of improvement in credit ratings from 2003 to 2007. 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 the country risk will depend on the magnitude

of the unexpected component of the event. In this case, a break with an underlying trend qualifies as unexpected. The biggest number of downgrades takes place in the 2013–2017 period, when a reversal of the upward trend in credit quality is observed.

The results of this study suggest that sovereign credit quality has an important role in determining how costly the access to private external financing can be. This becomes particularly relevant as private financing grows more important in the context of the 2030 Agenda and the need to increase the mobilization of resources for its implementation. 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, pondering how to strengthen institutions in general, reinforce fiscal management, and create innovative financial instruments that can improve risk sharing and mitigation.

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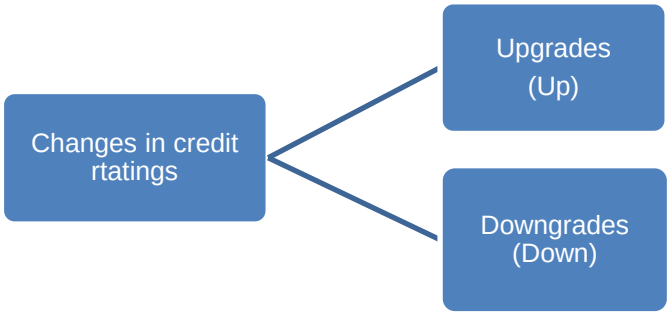
Annexes

Annex 1
Event study methodology

This annex is an overview of some important aspects of the event study methodology applied to this paper. The relevant literature is extensive (see for example the references in Kothari and Warner, 2004), beginning in the 1930s. However, two significant contributions are the seminal papers by Ball and Brown (1968) and Fama, Fisher, Jensen, and Roll (1969), which according to Campbell et al. (1996) introduced the methodology that is essentially still in use.

In more general terms, the event study methodology has the purpose of isolating the incremental impact of an event on a variable of interest besides the normal performance of that variable. In chapter II of this report an event is defined as a credit rating change,[12] with the two possible outcomes:

Diagram A1.1
Changes in credit ratings: possible outcomes



Source: Elaborated by the authors.

Following Campbell et al. (1996), the abnormal return is the actual ex-post return of the security (in chapter II 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:

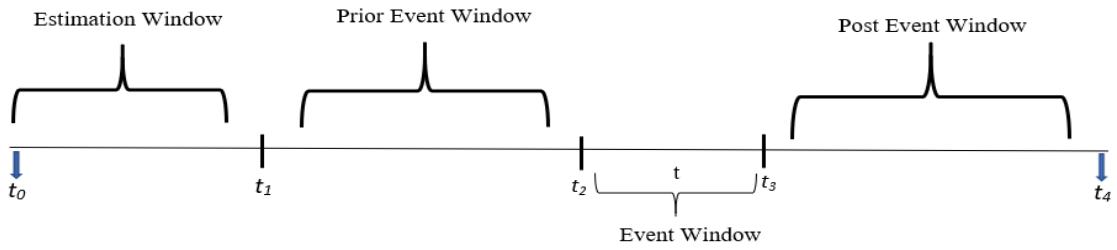
$$AR_{i,t}^{*} = R_{i,t} - E\left[R_{i,t} \mid x_t\right]$$

Where $AR_{i,t}^{*}$, $R_{i,t}$, and $E\left[R_{i,t}\right]$ are the abnormal, actual, and normal returns, for period t. x_t is the conditional information for the normal performance model. At this point emerges the key decision of how to measure normal returns (the returns that would have occurred if the event did not happen), which will be extracted from actual returns for the identification of abnormal returns. There are two main ways to do this: use a statistical or an econometric approach. The most used statistical approaches are the Market Model (MM), the Constant Mean Return Model (CMRM) and the Factor Models (FM). In the case of econometrics models, the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) are the most widespread methodologies. In Chapter II we decided to use the CAPM as our benchmark model, since this methodology accounts for more sophisticated financial specifications than the most common CMRM.

The time window is composed by the following four stages: the estimation window, which is the time frame for estimating the normal returns, the event window, which is the time where the event of interest takes place, and the prior and post event windows, where, jointly with the event window, are generally tested for different hypotheses of normality of returns.

[12] A *rating change* represents the actual change on the sovereign credit rating based on a shift in the CRA's perception of the likelihood of a rated debt obligation being repaid in full and on time.

Diagram A1.2
Event's time window: composed by four stages



Source: Elaborated by the authors based on (Campbell, Low and MacKinlay, 1996).

The next step consists in specifying the sampling interval and the event window length, for which is necessary to first define the following formulas:

The *Cumulative Abnormal Returns* (CAR) over time is defined as:

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

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

The *Variance of CAR* is given by:

$$VAR\left[CAR_i(T_2,T_3)\right]=\sigma_i^2(T_2,T_3)=(T_3-T_2+1)\cdot\sigma_{e_i}^2$$

For cross section aggregation purpose, the *Cumulative Average Abnormal Return* (CAAR) is defined as:

$$CAAR(T_2,T_3)=\frac{1}{N}\sum_{i=1}^{N} CAR_i(T_2,T_3)$$

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

The *Variance of CAAR* is given by:

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

Under the *null hypothesis* of no event effect, meaning that there is no abnormal return within the event window, [13] the following statistic is constructed for each kind of event – upgrade or downgrade by a credit rating agency (Standard & Poor's, Moody's and Fitch):

$$z=\frac{CAAR(T_2,T_3)}{\sqrt{VAR\left[CAAR(T_2,T_3)\right]}} \quad : \quad N(0,1)$$

In chapter II, an estimation window with a length of 30 days is used, balancing the availability of data and accuracy of estimated parameters against the potential contamination bias.[14] The event window was settled to 2 days, which includes the effective day of the event plus the day after it, due to lack of information about the precise hour at which the event took place, which could have happened after trading hours in the event day.

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

[14] Alternative estimations were made with different prior window lengths, including 15 and 60 days. Results of these estimations go in line with the 30 days window span (see annex B).

The selection of the model for estimating normal returns has presented similar difficulties to previous works regarding the availability of non-contaminated data in the estimation window. Taking this into account, we proceed to estimate a basic version of the CAPM. Particularly, 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

$$R_{i,t} = \alpha_i + \beta_i \cdot R_{m,t} + \varepsilon_{i,t}$$

$$\text{with } E\left[\varepsilon_{i,t}\right] = 0, \text{ and } Var\left[\varepsilon_{i,t}\right] = \sigma_i^2$$

where $R_{i,t}$, and $R_{m,t}$ are the period-t returns on security i and the market portfolio, respectively, and $\varepsilon_{i,t}$, is the zero-mean disturbance term. 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 rearrange it for estimating purposes we have:

$$\mathrm{E}(R_{i,t}) = R_f + \beta_i \cdot [E\left(R_{m,t}\right) - R_f]$$

where, $\mathrm{E}(R_{i,t})$ is the expected value of country's "i" EMBIG, at time "t"; and $E\left(R_{m,t}\right)$ 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 spread over similar but risk-free assets.

The parameter β_i could be expressed as:

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

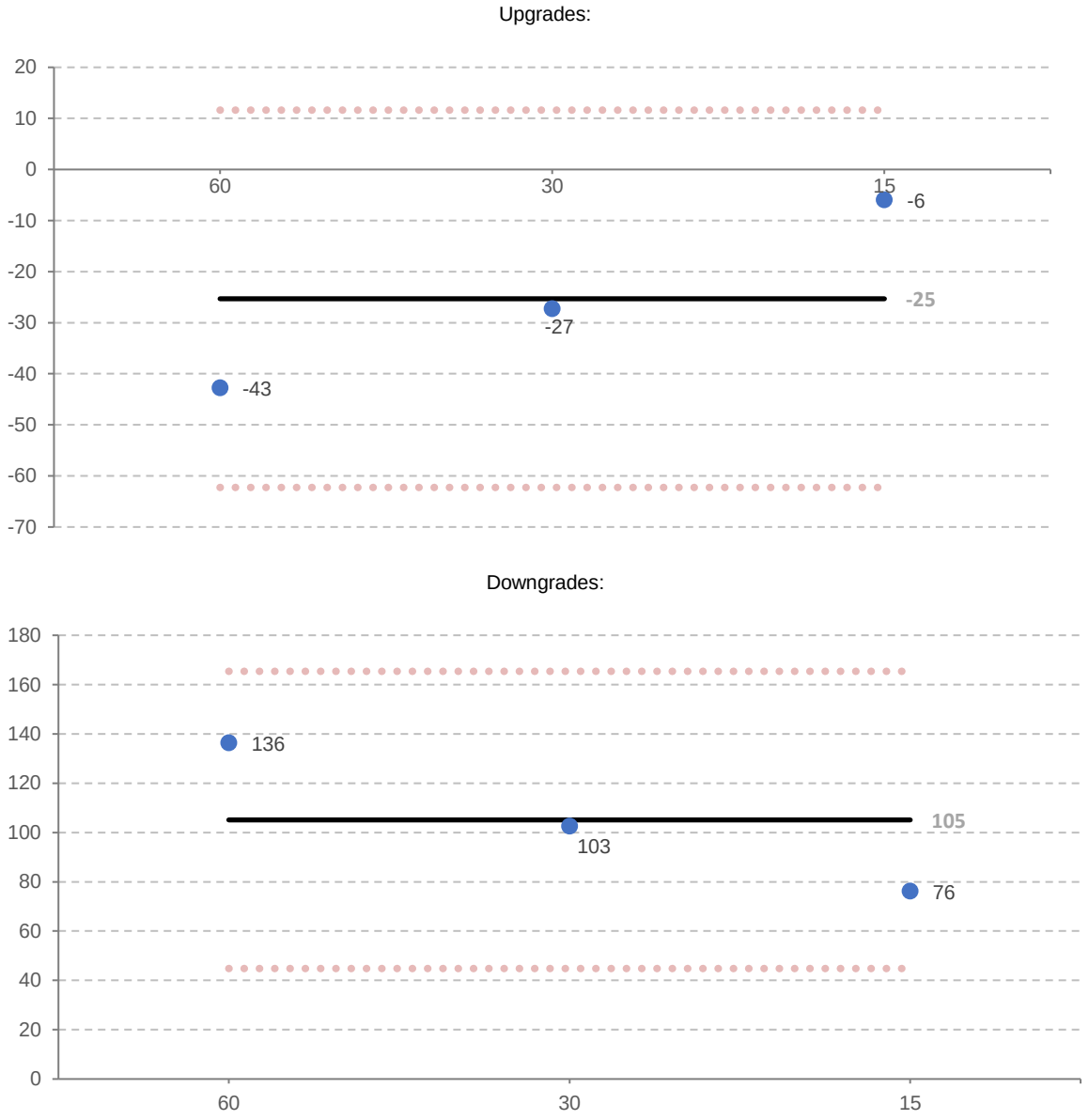
The results of using the above methodology are discussed in chapter II.

Annex 2
Results using other estimation windows

As mentioned in the previous section on the methodology used, we performed the event study accounting for different sizes of the estimation window. The summary of these results both for upgrades and downgrades are presented in the figures below, where the results are included into two standard deviation values (dashed line). Moreover, the 30-day window size, which we selected, is the closest to the average of the values of the three window spans (represented by the solid line).

Figure A2.1
Average cumulative change in spreads by estimation window's size (all agencies)

(Basis points)



Source: Authors based on estimations using the event study methodology for three different estimation windows of 60, 30 and 15 days. The dashed line represents +2 and -2 standard deviations, and the solid line the average.

Annex 3
Credit rating changes by country and by agency

Table A3.1
Standard & Poor's: rating changes by country

Country	Number of Upgrades	Number of Downgrades	Total
Argentina	7	6	13
Belize	2	8	10
Brazil	5	3	8
Chile	3	1	4
Colombia	3	1	4
Costa Rica	0	1	1
Dominican Republic	4	6	10
Ecuador	6	6	12
El Salvador	2	8	10
Guatemala	0	1	1
Jamaica	4	5	9
Mexico	3	1	4
Panama	3	0	3
Peru	5	0	5
Trinidad and Tobago	1	2	3
Uruguay	8	3	11
Venezuela (Bolivarian Republic of)	5	9	14
Total	**61**	**61**	**122**

Source: Authors based on collected data from Standard & Poor's. 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 (see table 10, p. 32) are considered in the event study.

Table A3.2
Moody's: rating changes by country

Country	Number of Upgrades	Number of Downgrades	Total
Argentina	4	1	5
Belize	4	2	6
Brazil	6	2	8
Chile	3	0	3
Colombia	3	0	3
Costa Rica	0	2	2
Dominican Republic	3	3	6
Ecuador	7	3	10
El Salvador	0	6	6
Guatemala	0	0	0
Jamaica	3	3	6
Mexico	2	0	2
Panama	2	0	2
Peru	5	0	5
Trinidad and Tobago	0	3	3
Uruguay	5	0	5
Venezuela (Bolivarian Republic of)	1	3	4
Total	**48**	**28**	**76**

Source: Authors based on collected data from Moody's. 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 (see table 10, p. 32) are considered in the event study.

Table A3.3
Fitch: rating changes by country

Country	Number of Upgrades	Number of Downgrades	Total
Argentina	2	2	4
Belize	0	0	0
Brazil	6	2	8
Chile	2	1	3
Colombia	3	0	3
Costa Rica	0	1	1
Dominican Republic	4	5	9
Ecuador	4	2	6
El Salvador	1	5	6
Guatemala	0	1	1
Jamaica	4	5	9
Mexico	3	1	4
Panama	2	0	2
Peru	5	0	5
Trinidad and Tobago	0	0	0
Uruguay	7	4	11
Venezuela (Bolivarian Republic of)	3	7	10
Total	**46**	**36**	**82**

Source: Authors based on collected data from Fitch. 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 (see table 10, p. 32) are considered in the event study.

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