

The Microstructure of the Brazilian Market for Corporate Bonds

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Abstract

Purpose – The Brazilian government approved regulations to foster the corporate bond market. In 2009, Instruction 476 of the *Comissão de Valores Mobiliários* (the Brazilian capital market regulator) relaxed the requirements for issuing bonds. In 2011, Law 12,431 created infrastructure bonds, which give individuals tax exemptions. Since then, aggregate proceeds have more than tripled. We describe the Brazilian bond market and the characteristics of issues and issuers; and critically evaluate this evolution.

Design/methodology/approach – Descriptive analysis. Data on aggregate issuances; bond characteristics (proceeds, maturity, yields, underwriting); issuer characteristics; secondary market (trading); performance (default and renegotiation rates); and allocation of issues.

Findings – Bond issues are small and bonds present a short maturity. International agencies are the main ratings providers, using a Brazilian-adjusted rating scale. Fixed-yield bonds are rare. The vast majority of regular bonds are linked to the interbank offered interest rate (DI or CDI). Only two local universal banks dominate the underwriting activity. These banks and their related parties receive more than half of the aggregate allocation. Less than half of issues have an investment grade, and more than half are not rated at all. The incidence of ex-post credit events is most frequently in the form of renegotiations of bond terms. Strict defaults are also high. Liquidity for bonds in the secondary market is low.

Originality/value – To our knowledge, this is the first article to describe the microstructure of the Brazilian bond market.

Keywords – Brazil, bonds, bond market, capital markets



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I Introduction

The microstructure of bond markets is a subject of research in a wide range of markets. In the United States, Fleming and Krishnan (2012) study government bonds, and Biais and Green (2019) examine corporate and municipal bonds. In Asia and Africa, Gyntelberg, Ma, and Remolona (2006) and Mo, Phelps, and Stotsky (2013) have also investigated the topic. Some authors have found key factors for the development of a corporate bond market. Ong (2005) indicates that good corporate governance fosters the development of local bond markets, while high levels of government debt issuance have the opposite effect. Hawkins (2002) points out that banks have a crucial role in bond markets in emerging economies. First, banks are competitors, because bond markets can replace bank lending and reduce deposits in banks. Second, banks play an important role in the allocation and issuance of corporate bonds.

This creates conflicts of interest among lending, underwriting, and asset management activities. Nonetheless, there is a paucity of studies on the Brazilian bond market and its role in the funding of non-financial corporations. This article starts to fill this gap, providing a description of the microstructure of the Brazilian bond market.

Credit to non-financial corporations (CNFC) in Brazil has been low (Carvalho, 2005; Torres & Macahyba, 2014). Table 1 illustrates this point. It reports CNFC as a percentage of GDP from 2005 to 2017. CNFC in Brazil ranges from 35% to 40% of GDP. This is below the averages for emerging markets, the G20, and other BRIC (Brazil, Russia, India, and China) countries. For decades, the low CNFC has been a concern for the Brazilian government. Several measures have been undertaken to improve CNFC, most notably the revision of the Bankruptcy Law in 2005 (Law n. 11,101, 2005), which increased creditors' rights.

Table 1
Credit to Non-Financial Corporations, as a percentage of GDP

	Brazil	Russia	India	China	Emerging Markets	G20 Countries
2005	37,6	31,0	n.d.	n.d.	n.d.	n.d.
2006	40,1	31,7	n.d.	106,5	n.d.	n.d.
2007	35,1	39,0	42,3	96,8	n.d.	n.d.
2008	41,6	42,8	46,2	96,3	56,3	78,1
2009	42,2	47,2	47,3	119,9	73,5	86,9
2010	42,4	41,9	50,3	120,7	72,1	83,3
2011	42,2	41,3	50,4	119,9	69,8	79,9
2012	44,0	39,8	51,9	130,6	78,0	84,0
2013	46,4	43,1	52,2	140,7	84,7	86,2
2014	47,5	53,8	50,3	149,9	88,7	84,5
2015	49,2	57,9	50,3	162,7	99,0	91,0
2016	45,9	51,5	46,3	166,4	101,7	91,6
2017	43,9	49,3	44,7	160,3	104,6	96,2

Source: Bank of International Settlements (<http://stats.bis.org>). n.a.: not available.

The Brazilian corporate bond market, as part of CNFC, has also had little relevance (Carvalho, 2000; Torres & Macahyba, 2014). Table 2 reports yearly aggregate bond issuance from 2005 to 2017. In the 2005-2008 period,

bond issuance was very modest. Proceeds averaged BRL 14.5 billion per year (nearly 44 issues per year), representing, on average, only 0.6% of GDP and 5.3% of CNFC.

Table 2
Bond Issuance over Time

Year	Total BRL bn (# issues)	Percentage of		Regular bonds (%)		Infra bonds (%)	
		GDP	CNFC	CVM-400	CVM-476	CVM-400	CVM-476
2005	14 (46)	0,66	6,69	100 (100)			
2006	22 (42)	0,92	8,51	100 (12,4)			
2007	13 (49)	0,49	3,90	100 (14,4)			
2008	9 (37)	0,29	1,90	100 (10,9)			
2009	29 (113)	0,88	6,04	45 (11,8)	55 (3,5)		
2010	55 (197)	1,41	9,88	29 (10,0)	71 (7,8)		
2011	52 (210)	1,20	8,01	6 (4,4)	94 (9,4)		
2012	92 (321)	1,90	12,96	16 (10,0)	79 (13,4)	1 (3,6)	4 (6,6)
2013	71 (346)	1,33	9,30	11 (7,1)	81 (14,4)	5 (19,6)	4 (10,4)
2014	123 (354)	2,12	15,46	2 (1,8)	94 (15,3)	2 (17,9)	2 (18,9)
2015	66 (270)	1,10	7,92	11 (2,1)	79 (11,4)	5 (19,6)	4 (14,2)
2016	60 (243)	0,96	8,07	0 (0,6)	92 (10,3)	3 (10,7)	5 (19,8)
2017	95 (354)	1,46	13,02	3 (1,2)	88 (14,5)	4 (28,6)	6 (36,2)
Total 2009-2017			BRL bn (# issues)	125,7 (340)	542,0 (2.080)	15,4 (56)	19,3 (106)

Year total amount issued in BRL billions, year total number of issues (in parentheses), percentage of year total in BRL billions, and percentage of year total issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors); *CNFC*: credit to non-financial corporations. Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

Until 2009, the only mechanism through which bonds could be issued was CVM-400 (*Instrução CVM n. 400*, 2003) of the *Comissão de Valores Mobiliários* (the Brazilian securities and exchange commission). Under it, issues needed to be registered at the CVM and prospectuses needed to be very detailed. In 2009, with the purpose of fostering the corporate bond market, the CVM issued CVM-476 (*Instrução CVM n. 476*, 2008). This new regulation created an alternative,

simplified procedure for bond issuance. CVM-476 does not require previous issue registration at the CVM. With the same purpose, Law 12,431 of 2011 created *infrastructure bonds* (or *infra bonds*) with tax exemption for individual and foreign investors.

CVM-476 and infra bonds together caused a significant change in the size of the bond market. As Table 2 shows, in the 2009-2017 period, yearly proceeds increased to BRL 71.4

billion per year (nearly 270 issues per year). These numbers, when compared to those of the 2005-2008 period, represent a 0.8% jump in term of GDP (from 0.6% to 1.4%) and 5% in terms of CNFC (from 5% to 10%).

CVM-476 and infra bonds together caused a significant change in the structure of the bond market. Over the 2009-2017 period, bonds issued under CVM-476 became predominant, accounting for 87% of the proceeds and 82% of the number of issues. Issuance of infra bonds began in 2012. During the 2012-2017 period, infra bonds accounted for 7% of the proceeds and the number of issues. After 2014, CVM-400 became less relevant for the issuance of *regular bonds* (i.e. non-infra bonds). As Table 1 reports, during the 2015-2017 period, it accounts for less than 10% of issuances. However, CVM-400 is still significant for the issuance of infra bonds. It accounted for 44% of the proceeds (35% of the number of issues) of the infra bonds issued between 2012 and 2017.

The rapid change in the size and structure of the Brazilian bond market motivates this article. We aim to provide a broad picture of this market. Section 2 briefly describes the legal provisions for bond issuance. Section 3 presents our data sources. Section 4 explores the characteristics of bond issues and their performance. Finally, Section 5 critically evaluates the recent changes that occurred in the bond market.

2 Brazilian provisions and regulations for bonds issuances

The Brazilian regulations have two provisions for bond issuances, both established by the Brazilian Securities and Exchange Commission (*Comissão de Valores Mobiliários, CVM*). These provisions are known as CVM Instruction 400 (*Instrução CVM n. 400, 2003*) and CVM Instruction 476 (*Instrução CVM n. 476, 2008*).

CVM-400, issued in 2003, regulates the traditional form of bond issuance. To begin with, issues must be previously registered at the CVM. Issuers must be public corporations¹

(*empresas abertas*, in Portuguese) and fill in a detailed prospectus. The prospectus contains: (i) complete information on the issuer's business, main advantages, and competitive strategies; (ii) a description of the issuer's five main risk factors, in order of relevance; (iii) details on the uses of the proceeds; and (iv) financial statements for the previous three years. Bonds issued under CVM-400 can be distributed to any investor and bear no restriction on trading. The only exception applies to bonds of pre-operational issuers that cannot be floated within the first eight months after issuance. These pre-operational bonds can only be distributed among qualified investors (QIs, with more than BRL 1 million invested in securities).

In 2009, the CVM issued CVM-476, which provides a broader, faster, and cheaper track for bond issuance than CVM-400. Under CVM-476, issuers are not required to be public corporations, and neither a detailed prospectus nor registration at the CVM are needed. However, some constraints apply: distribution is restricted to professional investors (PIs, with investments in securities of more than BRL 10 million); the prospectus can be distributed to at most 75 PIs; the issue can be divided among 50 PIs at most;² and bonds cannot be floated within the first 90 days after the issuance. However, after this lockup period, QIs can also trade the bond.

In 2011, Law 12,431 created infrastructure bonds (infra bonds). The proceeds of these bonds must be used to fund infrastructure projects. Before issuing infra bonds, corporations must have their projects approved by the government. Infra bond maturity cannot be less than 4 years. The interval between coupon payments cannot be less than 180 days. Infra bonds can be inflation-linked (effective interest rate pegged to the consumer price index, the *IPCA*), but not interest rate-linked. Only Specific Purpose Entities (SPE) are allowed to issue floating-rate infra bonds. In this case, the rate is pegged to the Brazilian interbank offered interest rate, the *CDI* (*certificado de depósito interbancário*, in Portuguese). During the first two years after issuance, issuers cannot

trade in their own infra bonds. Call provisions are not allowed. Infra bonds can be issued under both CVM-400 and CVM-476. Individuals (*peçoas físicas*, in Portuguese) and foreign investors are tax-exempt and legal entities (*peçoas jurídicas*, in Portuguese) pay a 15% rather than the usual 25% tax rate.

3 Data

The prospectuses and data on aggregate issuances, the characteristics of issuances, the secondary market, defaults, and renegotiations come from the Brazilian Association of Financial and Capital Market Entities (*Associação Brasileira das Entidades dos Mercados Financeiros e de Capitais*, ANBIMA).³ The data on the placement of the issuances come from the offer-closing announcements (*anúncios de encerramento de oferta*).⁴

4 The bond market

4.1 Bond characteristics

In this section, we characterize bonds issued in Brazil from 2009 to 2017.

Maturity: Table 3 lists the maturities of the different types of bonds. The last column reports aggregate values. The majority of the bonds (53% of the proceeds and 46% of the number of issues) have a maturity of between 5 and 10 years. Maturity between 3 and 5 years (22% of the proceeds and 20% of the number of issues) or below 3 years (22% of the number of issues, but only 14% of the proceeds) are also common. As expected, infra bonds have a longer maturity than regular bonds. Only rarely do they have a maturity below 5 years (their maturity cannot be less than 4 years).

Table 3
Bond Maturity

Sample period 2009-2017						
Maturity CVM-400	Regular bonds		Infra bonds		Overall	
	CVM-476	CVM-400	CVM-476			
< 3 years	10,3 (29)	86,4 (549)	-	-	14% (22%)	
3 to 5 years	25,4 (50)	127,6 (471)	-	0,27 (3)	22% (20%)	
5 to 10 years	75,5 (224)	276,1 (890)	11,1 (39)	8,7 (39)	53% (46%)	
> 10 years	14,4 (37)	51,8 (170)	4,2 (17)	10,3 (64)	12% (11%)	
Total (100%)	BRL bn (# issues)	66,8 (166)	542 (2.088)	15,5 (56)	19,3 (106)	643,6 (2.408)

Total in BRL billions, total number of issues (in parentheses), percentage of total in BRL billions, and percentage of total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Common bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Markets Participant (ANBIMA). Available at www.debentures.com.br.

Fixed versus Linked yield (retorno pré- and pós-fixado, in Portuguese): In general, Brazilian bonds have linked yields. Table 4 reports the types of yields. Fixed-yield bonds account for only 2.3% of the aggregate proceeds (0.8% of the number of issues). The vast majority of bonds, accounting for nearly 78% of the proceeds and number of issues, are linked to the Brazilian interbank offered rate (*CDI* or *DI*). Inflation-linked bonds account for

11% of proceeds and 17% of issues. Inflation-linkage prevails among infra bonds (69% of proceeds and 91% of the number of issues). Inflation-linkage is also frequent among regular CVM-400 bonds (28.5% of proceeds and 36.7% of the number of issues). US dollar-linked bonds are rare, accounting for only 6.4% of proceeds and 0.3% of the number of issues. Thus, US dollar-linked issues are large ones.

Table 4
Types of Yields

Sample period 2009-2017						
Index	Regular bonds		Infra bonds		Overall (%)	
	CVM-476	CVM-400	CVM-476			
Fixed rate	2,3% (1,8%)	1,4% (0,4%)	-	28,1% (7,5%)	2,3% (0,8%)	
Interest rate (DI)	64,1% (57,8%)	84,1% (87,1%)	-	-	77,5% (79,2%)	
Inflation index (any one)	28,5% (36,7%)	4,4% (9,2%)	100% (100%)	69,7% (91,5%)	11,1% (16,9%)	
Government-arbitrated	3,1% (2,4%)	1,1% (2,5%)	-	2,2% (0,9%)	1,3% (2,3%)	
Dollar	-	7,6% (0,4%)	-	-	6,4% (0,3%)	
Other	1,9% (1,2%)	1,3% (0,4%)	-	-	1,3% (0,4%)	
Total	BRL bn (# issues)	66,8 (166)	542 (2.088)	15,5 (56)	19,3 (106)	643,6 (2.408)

Proceeds: Proceeds are relatively low. Only 13.5% of the issues have proceeds of more than BRL 500 million. However, the aggregate proceeds of such bonds correspond to 54.2% of the total (Table 5, last column). On the other hand, small issues (proceeds of below BRL 100 million) represent only 6.5% of aggregate

proceeds, but this corresponds to 38% of the number of issues. CVM-476 seems to be most frequently used for small issues: 40.1% of issues have proceeds of below BRL 100 million, but this corresponds to only 6.9% of proceeds. This characteristic is relatively uniform across all types of bonds.

Table 5
Issue Size

Período amostral: 2009-2017						
BRL m CVM-400	Regular bonds		Infra bonds		Overall	
	CVM-476	CVM-400	CVM-476			
< 100	2,6% (16,3%)	6,9% (40,1%)	4,5% (19,6%)	12,2% (41,5%)	6,5% (38,0%)	
100 a 250	11,2% (27,7%)	18,0% (31,2%)	21,8% (35,7%)	31,9% (38,7%)	17,8% (31,4%)	
250 a 500	25,6% (29,5%)	20,4% (15,8%)	34,1% (28,6%)	28,3% (15,1%)	21,5% (17,0%)	
> 500	60,5% (26,5%)	54,8% (12,9%)	39,6% (16,1%)	27,7% (4,7%)	54,2% (13,5%)	
Total	BRL bn (# issues)	66,8 (166)	542 (2.088)	15,5 (56)	19,3 (106)	643,6 (2.408)

Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

Underwriting: Unlike other bond markets, where the underwriting of bonds is usually competitive and dominated by international investment banks (Carbo-Valverde, Rodriguez-Fernandez, & Saunders, 2016; Manconi, Neretina, & Renneboog, 2018), underwriting in the Brazilian bond market is dominated by only two local universal banks. Table 6 reports

on underwriting in the Brazilian bond market. Bradesco has the largest share: 53.3% of proceeds and 49.6% of issues. Itau-Unibanco has 43.5% of proceeds and 45.5% of issues. Banco do Brasil comes next with only 0.8% of proceeds and 0.4% of issues. This pattern is consistent across regular and infra bonds, and CVM-400 and CVM-476 issues.

Table 6
Leading Underwriters

Sample period: 2009-2017						
Bank	CVM-400	Regular bonds		Infra bonds		Overall
		CVM-476	CVM-400	CVM-476		
Banco do Brasil		0,8% (0,6%)	0,8% (0,4%)	0	0	0,8% (0,4%)
Bradesco		53,5% (46,4%)	53,7% (50,0%)	59,4% (62,5%)	33,7% (38,7%)	53,3% (49,6%)
Itaú		44,8% (51,8%)	42,8% (44,8%)	40,6% (37,5%)	59,5% (53,8%)	43,5% (45,5%)
Others		1,73% (1,8%)	3,43% (5,1%)	0	6,8% (7,5%)	3,27% (4,9%)
Total	BRL bn (# issues)	66,8 (166)	542 (2.088)	15,5 (56)	19,3 (106)	643,6 (2.408)

Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

4.2 Ex-ante issuer performance

Ratings: Brazilian bond ratings come predominantly from global rating agencies (Standard and Poors - S&P, Moodys, and Fitch). However, ratings also come from local rating agencies (mainly LF Rating and Austin Rating). Global rating agencies use a local rating scale, corresponding to their global scale with the suffix or prefix BR to indicate a local rating. For instance, S&P's best rating for Brazilian bonds is brAAA, which bears the same risk as Brazilian sovereign bonds (thus, brAAA is not equivalent to the global

AAA). The reference for local investment grade is the same as for the global one. For instance, S&P's lowest local investment-grade rating is brBBB-.

Table 7 reports on ratings. It is remarkable that more than half of the issues, accounting for 55.9% of the proceeds and 61.3% of the number of issues, have no rating at all. Issues with no rating prevail almost exclusively among regular CVM-476 bonds: 66% of proceeds and 70.5% of issues. Infra bonds usually have an investment grade: less than 10% of the infra bonds do not have an investment grade.

Table 7
Bond Issuance by Rating

Sample period 2009-2017						
Percent CVM-400	Regular bonds		Infra bonds		Overall (%)	
	CVM-476	CVM-400	CVM-476			
Investment grade	97,6% (98,2%)	33,6% (28,2%)	100%	94,2% (91,5%)	43,6% (37,5%)	
Non-investment grade	0,9% (1,2%)	0,5% (1,3%)	-	-	0,5% (1,2%)	
Not rated	1,5% (0,6%)	66,0% (70,5%)	-	5,8% (8,5%)	55,9% (61,3%)	
Total	BRL bn (# issues)	66,8 (166)	542 (2.088)	15,5 (56)	19,3 (106)	643,6 (2.408)

Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of the total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Agents (ANBIMA). Available at www.debentures.com.br.

Ex-ante credit events (EACEs: defaults or renegotiations): As an indicator of bond quality, reported EACEs complement ratings. Table 8 shows EACEs for two separate periods: 2009-2013 and 2014-2017. CVM-400 was predominant in the first period, and CVM-476 in the second (we exclude issues before 2009, when there was no CVM-476). Strikingly, the frequency of EACEs is high, regardless of the period. Overall, EACEs were reported for nearly 25% of proceeds,

representing 23 to 30% of the number of issues. EACEs are significantly more frequent for CVM-476 than for CVM-400 bonds, and for regular rather than for infra bonds. Focusing on regular bonds in the second period, the EACE rate was higher for CVM-476 than for CVM-400 bonds: 26.8% versus 17.6% of the proceeds. Reported EACEs were still frequent among infra bonds (6.3% for CVM-400 and 11.7% for CVM-476).

Table 8
Ex-ante Credit Events (EACEs)

Panel A: Sample period 2009-2013						
CVM-400		Regular bonds		Infra bonds	Overall	
		CVM-476	CVM-400	CVM-476		
EACEs		21,1% (20,4%)	27,8% (24,4%)	- (16,7%)	25,8% (23,5%)	
No EACEs		78,9% (79,6%)	72,2% (75,6%)	100% (83,3%)	74,2% (76,5%)	
Total	BRL bn (# issues)	54,4 (147)	234,4 (1.009)	3,9 (13)	6,4 (18)	299,2 (1.187)

Panel B: Sample period: 2014-2017						
CVM-400		Regular bonds		Infra bonds	Overall	
		CVM-476	CVM-400	CVM-476		
EACEs		17,6% (26,3%)	26,8% (33,4%)	6,3% (7,0%)	11,7% (9,1%)	25,2% (30,6%)
No EACEs		82,4% (73,7%)	73,2% (66,6%)	93,7% (93,0%)	88,3% (90,9%)	74,8% (69,4%)
Total	BRL bn (# issues)	12,3 (19)	307,6 (1.071)	11,6 (43)	13,0 (88)	344,4 (1.221)

Ex-ante Credit Events (renegotiations and defaults). Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of the total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

To further investigate *ex-ante credit events*, Table 9 splits them into *strict defaults* and *renegotiations*. The sample period is 2014-2017. By considering a more recent sample period, we increase the issuers' EACE track record. Panel A shows that renegotiation was quite frequent, affecting 23.4% of the proceeds and 29.0% of the issues. This is surprising, given the efforts and

coordination involved in the negotiation of bond terms. As expected, the overall strict default rate is low (Panel B): 2.7% of the aggregate proceeds and 2.4% of the issues. Strict default occurs only among regular CVM-467 bonds (2.9% of aggregate proceeds and 2.6% of issues) and infra CVM-400 bonds (4.0% of aggregate proceeds and 2.3% of issues).

Table 9

Ex-ante Credit Events (EACEs): Renegotiations versus Strict Defaults

Sample period: 2014-2017						
Panel A: Renegotiation						
CVM-400		Regular bonds		Infra bonds	Overall	
		CVM-476	CVM-400	CVM-476		
Renegotiations		17,6% (26,3%)	24,9% (31,7%)	2,3% (4,7%)	11,7% (9,1%)	23,4% (29,0%)
No renegotiations		82,4% (73,7%)	75,1% (68,3%)	97,7% (95,3%)	88,3% (90,9%)	76,6% (71,0%)
Total	BRL bn (# issues)	12,3 (19)	307,6 (1.071)	11,6 (43)	13,0 (88)	344,4 (1.221)
Panel B: Strict Default						
CVM-400		Regular bonds		Infra bonds	Overall	
		CVM-476	CVM-400	CVM-476		
Strict defaults		-	2,9% (2,6%)	4,0% (2,3%)	-	2,7% (2,4%)
No defaults		100%	97,1% (97,4%)	96,0% (97,7%)	100%	97,3% (97,6%)
Total	BRL bn (# issues)	12,3 (19)	307,6 (1.071)	11,6 (43)	13,0 (88)	344,4 (1.221)

Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of the total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

One would expect a negative correlation between EACEs and investment grades. In particular, issuers that receive investment grades are not expected to have reported EACEs. We investigate this. Table 10 reports a cross-tabulation between investment grades and EACEs in the 2014-2017 period. As expected, the EACE rate is lower among investment grade bonds than among bonds with no investment grade or without any

rating: 20.0% versus 55.5% and 34.1% of issues in each category, respectively. Strikingly, 20% (63 of 315 issues) is a very high rate of EACEs for investment grade bonds. However, only 3 of these 63 issues (0.9%) were from issuers that had reported a strict default. Thus, surprisingly, it seems that ratings do not reflect renegotiation as a credit event.

Table 10
Bond Ratings versus *Ex-ante* Credit Events (EACEs)

Number of issues	(sample period 2009-2013)			
	No EACEs	EACEs	EACEs	
			Renegotiations	Strict Defaults
Investment grade	252 (80%)	63 (20,0%)	60 (19,0%)	3 (0,9%)
Non-investment grade	4 (45,5%)	5 (55,5%)	5 (55,5%)	2 (22,2%)
Not rated	591 (65,9%)	306 (34,1%)	289 (32,2%)	24 (2,6)

Number of issues and the percentage of the total number of issues (in parentheses). *Investment grade*: bonds with credit rating equal to or higher than BBB-, on the Brazilian local scale. *Non-investment grade*: bonds with credit rating lower than BBB-. *Not rated*: bonds issued without credit rating. *Ex-Ante Credit Events* (EACEs): existence of previous events involving renegotiation or strict default by the issuer before the issuance. Source: Brazilian Association of Capital Market Agents (ANBIMA). Available at www.debentures.com.br.

4.3 Ex-post bond performance

Ex-post credit events (EPCEs: either defaults or renegotiations). The main indicator for bond performance is the occurrence of EPCEs. Table 11 reports on EPCEs for two separate periods: 2009-2013 and 2014-2017. One would expect the frequency of EPCEs to be lower in the more recent period, because the sample includes recently issued bonds. However, overall EPCEs are very similar in both periods: nearly 20% of proceeds and the number of issues. The unexpectedly high frequency of EPCEs in the second period comes mostly from regular CVM-476 bonds, which represent 89% of proceeds in the period

(307.6/344.4). Thus, regular CVM-476 bonds begin to present credit events from quite an early period after their issuance. For the other types of bonds, the result is as expected: a very low rate of EPCEs in the recent period. Also surprisingly, the rate of EPCEs among infra bonds in the first period is very high: 34.8% of proceeds among CVM-400 bonds and 45.9% among CVM-476 bonds. These high values are driven by two factors: the small size of the infra-bond market and the EPCEs of a few issuers (2 issues from OAS and OGX, which filed for financial distress, and four other issues from Termeletrica Pernambuco).

Table 11
Ex-post Credit Events (EPCEs)

Panel A: Sample period 2009-2013						
CVM-400		Regular bonds		Infra bonds		Overall
		CVM-476	CVM-400	CVM-476		
EPCEs		9,8% (8,8%)	20,3% (22,4%)	34,8% (38,5%)	45,9% (33,3%)	19,1% (21,1%)
No EPCEs		90,2% (91,2%)	79,7% (77,6%)	65,2% (61,5%)	54,1% (66,7%)	80,9% (78,9%)
Total	BRL bn (# issues)	54,4 (147)	234,4 (1.009)	3,9 (13)	6,4 (18)	299,2 (1.187)

Panel B: Sample period 2014-2017						
CVM-400		Regular bonds		Infra bonds		Overall
		CVM-476	CVM-400	CVM-476		
EPCEs		2,2% (5,3%)	23,0% (25,0%)	2,6% (2,3%)	2,5% (2,3%)	20,8% (22,3%)
No EPCEs		97,8% (94,7%)	77,0% (75,0%)	97,4% (97,7%)	97,5% (97,7%)	79,2% (77,7%)
Total	BRL bn (# issues)	12,3 (19)	307,6 (1.071)	11,6 (43)	13,0 (88)	344,4 (1.221)

EPCEs: defaults and renegotiations. Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of total number of issues (in parentheses). *Infra-bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

To further investigate *ex-post credit events*, Table 12 splits them into *strict defaults* and *renegotiations*. The sample period is 2009-2013. Panel A shows that renegotiations were quite frequent, affecting 16.4% of proceeds and 17.20% of issues. As expected, the overall strict default rate is smaller, but still considerable (Panel

B): 6.2% of aggregate proceeds and 8.7% of issues. Since the EPCEs among infra bonds are biased by a few cases, we focus only on regular bonds. Strict default occurs mostly among regular CVM-467 bonds (5.7% of proceeds and 8.8% of issues).

Table 12

Ex-post Credit Events (EPCEs): Renegotiations versus Defaults

Sample period: 2009-2013						
Panel A: Renegotiation						
CVM-400		Regular bonds		Infra bonds		Overall
		CVM-476	CVM-400	CVM-476		
Renegotiations		8,8% (7,5%)	18,3% (18,5%)	32,9% (30,8%)	1,6% (11,1%)	16,4% (17,2%)
No-renegotiations		91,2% (92,5%)	81,7% (81,5%)	67,1% (69,2%)	98,4% (88,9%)	83,6% (82,8%)
Total	BRL bn (# issues)	54,4 (147)	234,4 (1.009)	3,9 (13)	6,4 (18)	299,2 (1.187)
Panel B: Strict Default						
CVM-400		Regular bonds		Infra bonds		Overall
		CVM-476	CVM-400	CVM-476		
Strict Defaults		1,7% (2,0%)	5,7% (8,8%)	34,8% (38,5%)	45,9% (33,3%)	6,2% (8,7%)
No-Defaults		93,8% (98,0%)	94,3% (91,2%)	65,2% (61,5%)	54,1% (66,7%)	93,8% (91,3%)
Total	BRL bn (# issues)	54,4 (147)	234,4 (1.009)	3,9 (13)	6,4 (18)	299,2 (1.187)

Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br.

Table 13 reports a cross-tabulation between investment grade and EPCEs in the 2009-2013 period. As expected, the EPCE rate is lower among investment-grade bonds than among non-investment grade ones (bonds bearing a non-investment rating or not rated): 11.2% versus 77.2% and 28.8% of issues in each category, respectively. This proportion, 11.2% (66 of 586 issues), is a very high rate of EPCEs for investment-grade bonds. However, only 3.9% (23 of 586 issues) resulted from strict defaults (most

of the EPCEs are renegotiations). Nonetheless, this seems to be a very high default rate. For a comparison, consider the S&P default rate for global investment-grade corporate bonds for the 1981-2016 period (Standard and Poors, 2017). The average EPCE (default rate) rate among BBB- bonds (the lowest investment grade) is only 0.26%; among B- bonds, it is 9.6%; and for junk bonds with ratings below CCC, it is 23.9% (recall that in Brazil, the default rate among non-investment grade bonds is 77.2%).

Table 13
Bond Ratings versus Ex-post Credit Events (EPCEs)

Sample period: 2009-2013				
Number of issues	No EPCEs	EPCEs	EPCEs	
			Renegotiations	Strict Defaults
Investment grade	520 (88,8%)	66 (11,2%)	50 (8,5%)	23 (3,9%)
Non-investment grade	5 (22,8%)	17 (77,2%)	15 (68,2%)	4 (18,2%)
Not rated	412 (71,2%)	167 (28,8%)	139 (24,0%)	76 (13,1)

Number of issues and their percentage of the total number of issues (in parentheses). Investment grade: bonds issued with a credit rating equal to or higher than BBB- on the Brazilian local scale; Non-investment grade: bonds issued with a credit rating lower than BBB- on the Brazilian local scale; Not rated: bonds issued without a credit rating; Ex-Post Credit Events (EPCEs): events involving renegotiations or defaults after the issuance. Source: Brazilian Association of Capital Market Agents (ANBIMA). Available at www.debentures.com.br.

Liquidity: Our measure of liquidity is the percentage of days for which there was some trading of the bond. Table 14 reports the liquidity for bonds issued before 2013. 51.7% of issues (38.2% of proceeds) are never traded. Another 38.6% are traded on, at most, 5% of the days.

Only 1.5% of the issues are traded on more than 20% of the days. Liquidity varies across bond types. There is very little trading of regular CVM-476 bonds: 58.8% of these issues are never traded. This is expected, considering that these issues are allocated to, at most, 50 investors.

Table 14
Bond Liquidity

Sample period 2009-2013						
CVM-400	Regular bonds		Infra bonds		Overall	
	CVM-476	CVM-400	CVM-476			
x = 0%	7,2% (8,8%)	45,4% (58,8%)	-	62,2% (44,4%)	38,2% (51,7%)	
0% < x ≤ 5%	27,3% (43,5%)	49,3% (38,4%)	7,7% (7,7%)	23,3% (33,3%)	44,2% (38,6%)	
5% < x ≤ 10%	31,0% (24,5%)	3,5% (2,2%)	11,3% (38,5%)	9,8% (16,7%)	8,8% (5,6%)	
10% < x ≤ 20%	21,7% (15,0%)	1,5% (0,6%)	13,1% (15,4%)	4,7% (5,6%)	5,4% (2,6%)	
x > 20%	12,8% (8,2%)	0,3% (0,1%)	67,9% (38,5%)	-	3,4% (1,5%)	
Total	BRL bn (# issues)	54,4 (147)	234,4 (1.009)	3,9 (13)	6,4 (18)	299,2 (1.187)

Number of days with trading over the number of days since issuance. Total in BRL billions, total number of issues (in parentheses), percentage of total amount in BRL billions, and percentage of total number of issues (in parentheses). *Infra bonds*: bonds issued to fund priority infrastructure projects (created by Law 12,431 of 2011); *Regular bonds*: non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (registration required and broad distribution); and *CVM-476*: bonds issued under Instruction CVM-476 (registration not required and distribution restricted to a limited number of professional investors). Source: Brazilian Association of Capital Market Participants (ANBIMA). Available at www.debentures.com.br and www.cvm.gov.br

Clientele: The CVM requires underwriters to publish detailed information on the allocation of issues across groups of investors (referred to as *clientele*). This information is available in the *anúncios de encerramento de oferta*, or AEOs. We obtained AEOs for the 2015-2017 period only. We divided the *clientele* into two main groups: related to and non-related to the syndicate of underwriters. Related investors include all financial institutions, brokerage houses, and investment funds managed by the underwriter. Table 15 reports the allocation across *clienteles*. Remarkably, on average, nearly half of the proceeds are allocated to organizations/investors related to the underwriter. There is a strong cross-sectional variation between the different bonds.

CVM-476 bonds tend to be allocated to related investors more than CVM-400 ones are. For instance, among regular CVM-400 bonds, 70.5% of the proceeds go to non-related investors, while among regular CVM-476 bonds, this proportion is 45.2%. For infra bonds, this difference is 82.8% among CVM-400 bonds versus 58.1% among CVM-476 bonds. The main *clienteles* for Brazilian bonds are investment funds not related to the underwriter (39.4% of the allocation) and financial institutions related to the underwriter (33.7% of the allocation). Investment clubs, insurance companies, pension funds, and foreign investors receive less than 1% each. Curiously, investment funds managed by the underwriter receive only 2.49% of the proceeds.

Table 15
Bond Allocation by Type of Issuance

Investors	Regular bonds		Infra bonds		Overall
	CVM-400	CVM-476	CVM-400	CVM-476	
Allocation to Non-Related Investors/Organizations					
Investment clubs	0.00%	0.00%	0.06%	0.11%	0.01%
Mutual funds	58.68%	41.24%	6.59%	23.09%	39.37%
Insurance companies	0.46%	0.49%	0.06%	0.00%	0.44%
Other financial institutions	9.43%	1.65%	12.69%	14.65%	2.96%
Other legal entities	0.09%	0.13%	0.03%	0.08%	0.12%
Pension funds	1.73%	0.87%	0.96%	0.15%	0.85%
Foreign investors	0.00%	0.75%	0.00%	0.00%	0.66%
Legal persons	0.09%	0.09%	62.46%	20.04%	3.76%
Sub-total	70.5%	45.2%	82.8%	58.1%	48.2%
Allocation to Related Investors/Organizations					
Financial institutions	14.78%	35.74%	6.43%	29.04%	33.76%
Intermediate institutions	12.93%	15.37%	9.47%	10.52%	14.81%
Mutual funds	1.82%	2.98%	0.77%	0.36%	2.49%
Other legal entities	0.00%	0.65%	0.00%	1.38%	0.65%
Legal persons	0.00%	0.04%	0.48%	0.61%	0.09%
Sub-total	29.5%	54.8%	17.2%	41.9%	51.8%
Total (BRL bn)	2.4	106.1	4.9	6.7	120.0

Source: www.debentures.com.br and www.cvm.gov.br.
Sample period: 2015-2017 (not available on the CVM webpage before 2015).

5 Final remarks

This article describes the microstructure of the market for corporate bonds in Brazil. We focus on the 2009-2017 period, following two major changes in the bond market: the establishment of legislation CVM-476 and infrastructure bonds. These new regulations fostered the corporate bond market in Brazil. We examined some of the main characteristics of the bond market. First, bond proceeds tend to be small (70% of the issues are less than BRL 250 million). Also, bonds have a short maturity. For nearly 90% of the issues, it is below 10 years. International agencies are the main ratings providers. However, they use a Brazilian-adjusted rating scale. Fixed-yield bonds are rare. The vast majority of regular bonds (non-infrastructure bonds) are linked to the Brazilian interbank offered interest rate (DI or CDI). Infrastructure bonds are most commonly inflation-linked.

The most striking aspects of the Brazilian bond market concerns underwriting, allocation, and bond performance. Only two local universal banks dominate the underwriting activity. These banks and their related parties receive more than half of the allocation. This pattern is more frequent among bonds issued under CVM-476. In contrast, the majority of the CVM-400 bonds are allocated to non-related parties.

Less than half of issues have an investment-grade rating, and more than half are not rated at all. The exceptions are infra bonds, which almost always bear an investment-grade rating. Even more curiously, investment-grade ratings seem not to take into account recent credit events in the bond market: 20% of the issues with an investment grade come from issuers with a recently reported credit event (most commonly in the form of a renegotiation of bond terms).

The incidence of *ex-post credit events* (EPCEs) is high: nearly 20% of bonds. EPCEs occur mostly in the form of renegotiations of bond terms. However, strict defaults are also high, affecting 6% of bonds. Even among investment-grade bonds, EPCEs and strict defaults are high,

at 11% and 3.9% of issues. Finally, liquidity for bonds in the secondary market is low, with the exception of infra bonds issued under CVM-400.

The combination of a high frequency of renegotiations of bond terms, the frequent link to the DI rate (which is the reference for bank loans), low liquidity, and the use of CVM-476 (which waives, among other things, registration and the need for a detailed prospectus) possibly reflect the replacement of bank loans by corporate bonds. This was described by Torres and Macahyba (2014). Accordingly, banks recommend that their larger corporate clients issue corporate bonds whenever their short-term credit lines are fully used. In this process, banks offer guaranteed placement (acquiring part of the issue, if needed). The securities are placed in several portfolios under the underwriter's management, ranging from the bank's treasury to the investment funds under its management. This explains the abnormally high frequency of renegotiations of bond terms. This operation results in regulatory arbitrage. With this, banks pay fewer taxes and do not have to make provisions for credit risk. This scheme raises questions about whether an effective bond market exists in Brazil. Our results are in line with those of Hawkins (2002), who points out a conflict of interest of banks, as they are participants in the bond market.

Notas

- 1 In Brazil, public corporations are subject to the rules established in Law 6404/1976. Principal requirements for public corporations: bylaws in accordance with Law 6404/1976; creation of an investor relations department; appointment of an officer for investor relations; and financial statements audited by an independent auditor and made available in the public domain.
- 2 At first, these limits were 50 and 25 QIs, respectively. The current limits date from 2014.
- 3 Available at www.debentures.com.br.
- 4 Available at www.cvm.gov.br.

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1. Definition of research problem	√	√
2. Development of hypotheses or research questions (empirical studies)	√	√
3. Development of theoretical propositions (theoretical work)	√	√
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	
6. Data collection		√
7. Statistical analysis	√	√
8. Analysis and interpretation of data	√	√
9. Critical revision of the manuscript	√	√
10. Manuscript writing	√	√
11. Other (please specify which)		