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Abstract. We describe the evolution of the Brazilian bond market, the characteristics of issues and issuers. We find that Bond proceeds are small and have short maturity. International agencies are the main providers of rating. Fixed-yield bonds are rare. Generally, bonds are linked to the Brazilian interbank-offered interest rate (DI or CDI). Two local banks dominate the underwriting activity. These banks and their related parties receive more than half of the allocation. Less than half of issues have an investment-grade rating, and more than half are not rated at all. The incidence renegotiation of terms and default is also high. Liquidity in the secondary market is low.

Keywords: Brazil, bonds, bond market, capital markets

JEL codes: G18, G30

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1. 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), for government bonds; and Biais and Green (2019), for corporate and municipal bonds. In Asia and Africa, Gyntelberg, Ma and Remolona (2006); and Mo, Phelps and Slotsky (2013). 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 works in the opposite direction. 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 (de Carvalho, 2005; and Torres-Filho and Macahyba, 2014). Table 1 illustrate this point. It reports CNFC as a percentage of GDP from 2005 to 2017. CNFC in Brazil ranges from 35% to 40% of the GDP. This is below the averages of emerging markets, G20, and of other BRIC countries (Brazil, Russia, India and China). 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 (Lei Federal 11.101), that increased creditors' rights.

The Brazilian corporate bond market, as part of CNFC, has also had little relevance (de Carvalho, 2000; and Torres-Filho and 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 bi per year (nearly 44 issues per year), representing, in average, only 0.6% of the GDP and 5.3% of CNFC.

Until 2009, the only mechanism to issue bonds was CVM-400 (*Instrução 400* from *Comissão de Valores Mobiliários*, the Brazilian securities and exchange commission). Under it, issues needed to be registered at CVM and prospectuses needed

to be very detailed. In 2009, with the purpose of fostering the corporate bond market, the Brazilian CVM issued CVM-476 (*Instrução CVM 476*). This new regulation created an alternative, simplified procedure for bond issuance. CVM-476 does not require previous issue registration at 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, yearly proceeds increased to BRL \$71.4 bi per year (nearly 270 issues per year). These numbers, when compared to those of the 2005-2008 period, represent a jump of 0.8% 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 lost relevance for the issuance of *Regular bonds* (as a reference to non-Infra-bonds). As Table 1 reports, during the 2015-2017 period, it accounts for less than 10% of the issuance. 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 fast 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 regulation for bonds issuance

Brazilian regulations have two provisions for bond issuance, both established by the Brazilian Securities and Exchange Commission (*Comissão de Valores Imobiliários, CVM*). These provisions are known as *Instrução CVM 400* (ICVM-400 or CVM-400) and *Instrução CVM 476* (ICVM-476 or CVM-476).

CVM-400, issued in 2003, regulates the traditional form of bond issuance. To begin with, issues must be previously registered at CVM. Issuers must be public corporations¹ (Portuguese: *empresa aberta*) and fill in a detailed prospectus. The prospectus contains (i) complete information on the issuers' 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 investors and bear no restriction on trading. The only exception applies to bonds from pre-operational issuers that cannot float within the first eight months from issuance. These pre-operational bonds can be placed only among qualified investors (*QI*, from the Portuguese, *investidores qualificados*: those with more than BRL \$1 mi invested in securities).

In 2009, CVM issued Rule-476 that 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 detailed prospectus nor registration at CVM is needed. However, some constraints apply: the placement is restricted to professional investors (*PI*, from the Portuguese, *investidores profissionais*, those with investment in securities above BRL \$10 mi); the prospectus can be distributed to at most 75 PI investors; the issue can be placed among at most 50 PI;² and bonds cannot float within the first 90 days after the issuance. However, after this lockup period, *QI* can also trade on the bond.

In 2011, Law 12.431 created Infrastructure bonds (Infra-bonds). 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-bonds' 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, *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, *CDI* (Portuguese: *certificado de depósito*

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 investors' relations department; nomination of an officer for investors' relations; and financial statements audited by an independent auditor, and of public domain.

² At first, these limits were 50 and 25 QI, respectively. The current limits date from 2014.

interbancário). 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 (Portuguese: *peçoas físicas*) and foreign investors are tax-exempt and legal investors (Portuguese: *peçoas jurídicas*) pay 15% rather than the usual 25% tax-rate.

3. Data

Prospectuses and data on aggregate issuance, characteristics of issues, the secondary market, default and renegotiation come from the national association of capital markets agents (*Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais*, ANBIMA).³ Data on the placement of issues 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 maturity across 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 maturity between 5-10 years. Maturity between 3-5 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 longer maturity than regular bonds. Only rarely, do they have maturity below 5 years (their maturity cannot be less than 4 years).

Fixed- versus Linked-yields (Portuguese: *retorno pré- and pós-fixado*): in general, Brazilian bonds have linked yields. Table 4 report 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, nearly 78% of the proceeds and number of issues, are linked to the Brazilian interbank offered rate (*Certificado de Depósito Interbancário*, *CDI* or *DI*). Inflation-linked bonds account for 11% of proceeds and 17% of issues. Inflation-linkage

³ Available at www.debentures.com.br.

⁴ Available at www.cvm.gov.br.

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

Proceeds: proceeds are relatively low. Only 13.5% of the issues have proceeds above BRL \$500 mi. However, the aggregate proceeds of such bonds correspond to 54.2% of the total (Table 5, last column). On the opposite side, small issues (proceeds below BRL \$100 mi) represent only 6.5% of aggregate proceeds, but this corresponds to 38% of number of issues. CVM-476 seems to be most frequently used for small issues: 40.1% of issues have proceeds below BRL \$100 mi, but this corresponds to only 6.9% of proceeds. This characteristic is relatively uniform across all types of bonds.

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

4.2. *Ex-ante* issuers' performance

Rating: 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 suffix or prefix BR to indicate a local rating. For instance, the S&P best rating for Brazilian bonds is brAAA, which bears the same risk as the Brazilian Sovereign bonds (thus, brAAA is not equivalent to global AAA). The reference for local investment grade is the same as for the global. For instance, the S&P lowest local investment-grade rating is brBBB-.

Table 7 reports ratings. It is remarkable that more than half of the issues: 55.9% of the proceeds (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 investment grade.

Ex-ante credit event (EACE: default or renegotiation): as indicator of bond quality, reported EACE complements rating. Table 8 shows EACE 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 EACE is high, regardless of the period. Overall, EACE was reported for nearly 25% of proceeds, representing 23 to 30% of number of issues. EACE is significantly more frequent for CVM-476 than for CVM-400 bonds, and for Regular 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 EACE was still frequent among Infra-bonds (6.3% for CVM-400 and 11.7% for CVM 476).

To further investigate *ex ante credit events*, Table 9 splits them into *strict default* and *renegotiation*. The sample period is 2014-2017. By considering a more recent sample period, we increase issuers' EACE track record. Panel A shows that renegotiation was quite frequent, reaching 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, 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 (4.0% of aggregate proceeds and 2.3% of issues).

One would expect a negative correlation between EACE and investment grade. In particular, issuers that receive investment grade are not expected to have reported EACE. We investigate this. Table 10 reports cross-tabulation between investment grade and EACE in the 2014-2017 period. As expected, the EACE rate is lower among investment grade bonds than among bonds with no investment grade or a without 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 EACE for investment grade bonds. However, only 3 of these 63 issues (0.9%) were from issuers with reported strict default. Thus, surprisingly, it seems that ratings do not reflect renegotiation as a credit event.

4.2. Ex-post bond performance

Ex-post credit events (EPCE: either default or renegotiation). The main indicator for bond performance is the occurrence of EPCE. Table 11 reports EPCE for two separate periods: 2009-2013 and 2014-2017. One would expect frequency of EPCE to be lower in the more recent period, because the sample includes recently issued bonds. However, overall EPCE is very similar in both periods: nearly 20% of proceeds and number of issues. The unexpectedly high frequency of EPCE in the second period comes mostly from Regular-CVM-476 bonds that 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 EPCE in the recent period. Also surprisingly, the rate of EPCE among Infra-bonds in the first period is very high: 34.8% of proceeds among CVM-400 and 45.9% among CVM-476. These high values are driven by two factors: the small size of the Infra-bond market and EPCE of a few issuers (2 issues from OAS and OGX that filed for financial distress, and four other issues from Termeletrica Pernambuco).

To further investigate *ex-post credit events*, Table 12 splits them into *strict default* and *renegotiation*. The sample period is 2009-2013. Panel A shows that renegotiation was quite frequent, reaching 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 EPCE among Infra-bonds is 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 13 reports cross-tabulation between investment grade and EPCE in the 2009-2013 period. As expect, EPCE rate is lower among investment-grade bonds than among non-investment grade (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 EPCE for investment-grade bonds. However, only 3.9% (23 of 586 issues) resulted from strict default (most of EPCE is renegotiation). Nonetheless, this seems to be a very high default rate. For 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, 9.6%; and for junk bonds with

ratings below CCC, 23.9% (recall that in Brazil, the default rate among non-investment grade bonds is 77.2%).

Liquidity: Our measure of liquidity is the percentage of days for which there was some trade on the bond. We consider only 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 trade on Regular-CVM-476: 58.8% of these issues are never traded. This is expected, considering that these issues are allocated to, at most, 50 investors.

Clientele: CVM requires that underwriters publish detailed information on issues' allocation across groups of investors (referred to as clientele). This information is available in the *anuncios de encerramento de oferta*, AEO. We obtained AEO for the 2015-2017 period only. We divided the clientele into two main parties: related to and not-related to the syndicate of underwriters. Related parties include all financial institutions, brokerage houses, and investment funds managed by the underwriter. Table 15 reports allocation across clienteles. Remarkably, on average, nearly half of the proceeds are allocated to related parties. There is a strong cross-sectional variation over the different bonds. CVM-476 bonds tend to be allocated to related parties more than CVM-400 are. For instance, among Regular-CVM-400 bonds, 70.5% of the proceeds go to not-related parties, while among Regular-CVM-476, this proportion is 45.2%. For Infra-bonds, this difference is 82.8% among CVM-400 versus 58.1% among CVM-476. 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.

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 institution of legislation CVM-476 and infrastructure bonds. These new regulations fostered the corporate bond market in Brazil. We have 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 mi). Also, bonds have short maturity. For nearly 90% of the issues, it is below 10 years. International agencies are the main providers of rating. 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 is 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 exception are Infra-bonds that almost always bear an investment-grade rating. Even more curiously, investment-grade rating seems not to take into account recent credit events in the bond market: 20% of the issues with investment grade come from issuers with a recently reported credit event (most commonly in the form of bond terms renegotiation).

The incidence of *ex post credit events* (EPCE) is high: nearly 20% of bonds. EPCE occurs mostly in the form of renegotiation of bond terms. However, strict default is also high, reaching 6% of bonds. Even among investment-grade bonds, EPCE and strict default are large, 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 high frequency of renegotiation 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 (that 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 in Torres-Filho 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 guarantee of placement (acquiring part of the issue, if needed). The securities are placed in several portfolios under the underwriter's

management, from bank treasury to the investment funds under its management. This explains the abnormally high frequency of bond terms renegotiation. This operation results in a regulatory arbitrage. By doing so, banks pay fewer taxes and do not have to make provision for credit risk. This scheme raises a question about the existence of an effective bond market in Brazil. Our results are in line with those of Hawkins (2002), who points out a conflict of interest of banks as participants of the bond market.

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Table 1
Credit to Non-Financial Corporations (NFC)
(as percentage of GDP)

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

	Brazil	Russia	India	China	Emerging Markets	G20 Countries
2005	37.6	31.0	n.a.	n.a.	n.a.	n.a.
2006	40.1	31.7	n.a.	106.5	n.a.	n.a.
2007	35.1	39.0	42.3	96.8	n.a.	n.a.
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

Table 2
Bond Issuance over Time
(proceeds and number of issues)

Year total amount issued in BRL billions, year total number of issues (in parentheses), percentage of year total BRL value 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 (required registration 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 Markets Participants (ANBIMA). Available at www.debentures.com.br.

Year	Total BRL Bi (# issues)	percent 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 Bi (# issues)	125,7 (340)	542,0 (2,080)	15,4 (56)	19,3 (106)

Table 3
Bond Issuance by Maturity
(sample period 2009-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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); *Common bonds*: Non-infra bonds; *CVM-400*: bonds issued under Instruction CVM-400 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Maturity		Regular bonds		Infra-bonds		Overall
		CVM-400	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 Bi (# issues)	66.8 (166)	542 (2,088)	15.5 (56)	19.3 (106)	643.6 (2,408)

Table 4
Types of Yields

(sample period 2009-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Index	Regular bonds		Infra-bonds		Overall (%)	
	CVM-400	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 (anyone)	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 bi (# issues)	66.8 (166)	542 (2,088)	15.5 (56)	19.3 (106)	643.6 (2,408)

Table 5
Issues' Size

(sample period: 2009-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

BRL mi	Regular bonds		Infra-bonds		Overall	
	CVM-400	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 to 250	11.2% (27.7%)	18.0% (31.2%)	21.8% (35.7%)	31.9% (38.7%)	17.8% (31.4%)	
250 to 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 Bi (# issues)	66.8 (166)	542 (2,088)	15.5 (56)	19.3 (106)	643.6 (2,408)

Table 6
Leading Underwriters
(sample period: 2009-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Bank	Regular bonds		Infra-bonds		Overall	
	CVM-400	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 Bi (# issues)	66.8 (166)	542 (2,088)	15.5 (56)	19.3 (106)	643.6 (2,408)

Table 7
Bond Issuance by Rating
(sample period 2009-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Agents (ANBIMA). Available at www.debentures.com.br.

Percent	Regular-bonds		Infra-bonds		Overall (%)	
	CVM-400	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 bi (# issues)	66.8 (166)	542 (2,088)	15.5 (56)	19.3 (106)	643.6 (2,408)

Table 8
Ex-ante Credit Event (EACE)
(renegotiation and default)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Panel A: Sample period 2009-2013						
		Regular bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
EACE		21.1% (20.4%)	27.8% (24.4%)	-	8.4% (16.7%)	25.8% (23.5%)
No EACE		78.9% (79.6%)	72.2% (75.6%)	100%	91.6% (83.3%)	74.2% (76.5%)
Total	BRL Bi (# issues)	54.4 (147)	234.4 (1,009)	3.9 (13)	6.4 (18)	299.2 (1,187)
Panel B: Sample period: 2014-2017						
		Regular bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
EACE		17.6% (26.3%)	26.8% (33.4%)	6.3% (7.0%)	11.7% (9.1%)	25.2% (30.6%)
No EACE		82.4% (73.7%)	73.2% (66.6%)	93.7% (93.0%)	88.3% (90.9%)	74.8% (69.4%)
Total	BRL bi (# issues)	12.3 (19)	307.6 (1,071)	11.6 (43)	13.0 (88)	344.4 (1,221)

Table 9
Ex-ante Credit Event: Renegotiation versus Strict Default
(sample period: 2014-2017)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Panel A: Renegotiation						
		Regular bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
Renegotiation		17.6% (26.3%)	24.9% (31.7%)	2.3% (4.7%)	11.7% (9.1%)	23.4% (29.0%)
No renegotiation		82.4% (73.7%)	75.1% (68.3%)	97.7% (95.3%)	88.3% (90.9%)	76.6% (71.0%)
Total	BRL Bi (# issues)	12.3 (19)	307.6 (1,071)	11.6 (43)	13.0 (88)	344.4 (1,221)
Panel B: Strict Default						
		Regular bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
Strict default		-	2.9% (2.6%)	4.0% (2.3%)	-	2.7% (2.4%)
No default		100%	97.1% (97.4%)	96.0% (97.7%)	100%	97.3% (97.6%)
Total	BRL bi (# issues)	12.3 (19)	307.6 (1,071)	11.6 (43)	13.0 (88)	344.4 (1,221)

Table 10
Bond Rating versus *Ex-ante* Credit Event (EACE)

(sample period 2009-2013)

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-, in the Brazilian local scale. *Non-investment grade*: bonds with credit rating lower than BBB-. *Not rated*: bonds issued without credit rating. *Ex-Ante Credit Event* (EACE): existence of previous events of renegotiation or strict default of the issuer before the issuance. Source: Brazilian Association of Capital Markets Agents (ANBIMA). Available at www.debentures.com.br.

Number of issues	No EACE	EACE	EACE	
			Renegotiation	Strict Default
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)

Table 11
Ex-post Credit Event (EPCE)
(Default and Renegotiation)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Panel A: Sample period 2009-2013						
		Regular-bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
EPCE		9.8% (8.8%)	20.3% (22.4%)	34.8% (38.5%)	45.9% (33.3%)	19.1% (21.1%)
No EPCE		90.2% (91.2%)	79.7% (77.6%)	65.2% (61.5%)	54.1% (66.7%)	80.9% (78.9%)
Total	BRL bi (# issues)	54.4 (147)	234.4 (1,009)	3.9 (13)	6.4 (18)	299.2 (1,187)
Panel B: Sample period 2014-2017						
		Regular-bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
EPCE		2.2% (5.3%)	23.0% (25.0%)	2.6% (2.3%)	2.5% (2.3%)	20.8% (22.3%)
No EPCE		97.8% (94.7%)	77.0% (75.0%)	97.4% (97.7%)	97.5% (97.7%)	79.2% (77.7%)
Total	BRL bi (# issues)	12.3 (19)	307.6 (1,071)	11.6 (43)	13.0 (88)	344.4 (1,221)

Table 12
Ex-post Credit Event (EPCE): Renegotiation versus Default
(2009-2013)

Total in BRL billions, total number of issues (in parentheses), percentage of total BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br.

Panel A: Renegotiation						
		Regular-bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
Renegotiation		8.8% (7.5%)	18.3% (18.5%)	32.9% (30.8%)	1.6% (11.1%)	16.4% (17.2%)
No-renegotiation		91.2% (92.5%)	81.7% (81.5%)	67.1% (69.2%)	98.4% (88.9%)	83.6% (82.8%)
Total	BRL Bi (# issues)	54.4 (147)	234.4 (1,009)	3.9 (13)	6.4 (18)	299.2 (1,187)
Panel B: Strict Default						
		Regular-bonds		Infra-bonds		Overall
		CVM-400	CVM-476	CVM-400	CVM-476	
Strict Default		1.7% (2.0%)	5.7% (8.8%)	34.8% (38.5%)	45.9% (33.3%)	6.2% (8.7%)
No-Default		93.8% (98.0%)	94.3% (91.2%)	65.2% (61.5%)	54.1% (66.7%)	93.8% (91.3%)
Total	BRL Bi (# issues)	54.4 (147)	234.4 (1,009)	3.9 (13)	6.4 (18)	299.2 (1,187)

Table 13
Bond Rating x EPCE
(sample period 2009-2013)

Number of issues and its percentage of the total number of issues (in parentheses). Investment grade: bonds issued credit rating equal or higher than BBB- in Brazilian local scale; Non-investment grade: bonds issued with credit rating lower than BBB- in Brazilian local scale; Not rated: bonds issued without credit rating; Ex-Post Credit Event (EPCE): event of renegotiation or default after the issuance. Source: Brazilian Association of Capital Markets Agents (ANBIMA). Available at www.debentures.com.br.

Number of issues	No-EPCE	EPCE	EPCE	
			Renegotiation	Strict Default
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)

Table 14
Liquidity

(bonds issued during 2009-2013 period)

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 BRL value 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 (required registration 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 Participants (ANBIMA). Available at www.debentures.com.br and www.cvm.gov.br

Panel A: sample period 2009-2013						
		Regular-bonds		Infra-bonds		Overall
		CVM-400	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 Bi (# issues)	54.4 (147)	234.4 (1,009)	3.9 (13)	6.4 (18)	299.2 (1,187)

Table 16
Bond Allocation by Type of Issuance

Source: www.debentures.com.br and www.cvm.gov.br

Sample 2015-2017 (restrição dos anúncios de encerramento na página da CVM)

Investors	Regular-bonds		Infra-bonds		Overall
	CVM-400	CVM-476	CVM-400	CVM-476	
Non Related Parts					
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%
Related Parts					
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 Bi)	2.4	106.1	4.9	6.7	120.0