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## Information asymmetry and the Brazilian sovereign rating in the assessment of Credit Rating Agencies

### ABSTRACT

**Objective:** analyze the asymmetries of information in the content of the synthetic reports issued by the Credit Rating Agencies (CRA) Standard & Poor's, Moody's, and Fitch on the Brazilian sovereign rating.

**Method:** a content analysis was performed on the CRA synthetic reports to create variables and categories. Correspondence Analysis (CA) aimed these same category variables at a multidimensional space for comparative analysis.

**Originality/Relevance:** the study shows how the asymmetry of information between lenders and borrowers of sovereign bonds can also be preceded by the CRAs when they make different assessments of the same financial product available to the market. The result shows that information asymmetry between creditors and borrowers does not end; it just changes the source of information.

**Results:** the results showed that, although the content of the evaluations was harmful in the CRA, there are asymmetries in specific categories. Standard & Poor's, for example, was the agency that stood out the most in the analyses; this is because it differs from other CRAs and positions itself more freely between categories in different years.

**Theoretical/Methodological contributions:** the study integrates qualitative and quantitative methods to expand research on CRA information asymmetry. The study also analyzes synthetic reports, the most accessible to decision-makers in the market, showing that the analysis of complex reports and robust data is not exclusive to analyzing asymmetric information. In addition, it explores results on information asymmetry and the Brazilian sovereign, where few approaches and investigations have focused on the national academic scenario.

**Keywords:** Asymmetry. Brazil. CRA. Information. Sovereign rating.

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## 1 INTRODUCTION

Credit Rating Agencies (CRA) are specialized companies (Bichoffe, 2017; Poon, 2012) that issue a rating on companies, banks, and sovereign states to the market and determine the ability of these institutions to fulfill their obligations. Guided by "economic rationality," the risk ratings that these agencies issues can increase the efficiency and transparency of the capital market (Langohr & Langohr, 2008).

Receiving much attention in recent decades (White, 2018), the main CRAs in the market are Standards & Poor's, Moody's, and Fitch Service. Even though they are not the only sources of this type of information (White, 2018), they have much influence on market prices, and their impacts are associated not only with new information but also with certifications, such as the use of Outlooks, revisions, and supervisions (Kiff et al., 2010).

The informational content of the CRA is always based on scientific research, as it has implications for investments. For example, Drago & Gallo (2017) and Kemper & Mortenson (2020) provide results on the impacts of these ratings on markets. Other studies, such as Bedendo et al. (2017), Jorge (2019), Kemper & Mortenson (2020), have focused on the economic and financial applicability that CRA brings.

In several areas, empirical and theoretical studies address an important question about the role of CRA. They overcome information asymmetry and improve capital market efficiency (Chan & Yung, 2011; Ebenroth & Dillon, 1992; Ferri & Lacitignola, 2009; Langohr & Langohr, 2008). Asymmetric information refers to situations in which some creditors hold more or better information about borrowers than the opposite (Olegario, 2009). The problem that borrowers have more and better information about themselves and their ability to pay creditors highlights a limbo in transactional relationships in the market. For this reason, studies that relate information asymmetry and the role that CRA promote have been widely discussed. Shen, Huang and Hasan (2011), Korkeamäki et al. (2014), and Jung and Park (2018), for example, have shown the effects or impacts of information asymmetries in the market. Likewise, Tang (2009) shows how the asymmetry of information in the credit market affects the results of companies.

In addition to corporate analysis, CRAs also assess sovereign bonds, an activity they began to perform from the 1970s onwards. It is clear that, as with corporate ratings, CRA credit ratings can reduce information asymmetry in sovereign bond markets (Ferri & Liu, 2005). Thus, many studies have focused on the relevance of ratings on countries and the impacts of this type of analysis on the market. This perspective opens research gaps that can be analyzed in the light of different sovereigns, such as emerging ones. Moreover, these classifications are highly relevant for these countries, as they help foreign investors in their investments (Markoski & Moreira, 2010).

Although most research on CRA information asymmetry is carried out using complex reports and robust econometric data, the synthetic reports issued by the Agencies are the most accessible alternatives with the availability of information for investors and other financial market institutions. However, limitations of access to the complete CRA reports are a considerable problem in light of the analyses of researchers and investors worldwide because, in most cases, they are only available at a specific and high price. Sangiorgi and Spatt (2017) criticize this charging model because it excludes those who do not buy the information. These access limitations stem from issuing the report using an issuer-paid, or issuer-pays, payment style, a model used by CRAs since the 1970s (White, 2009).

Regarding the rating of the Brazilian sovereign, for example, it is noted that in 2014 the country entered a rating decline stage, when in 2015, by Standards & Poor's, it returned to

the speculative grade, a scale it had left in 2008. Based on the results of the National Treasury (2022) and twenty-seven reports issued by the CRAs in 2014-2019, the country stood out for six years, decreasing the rating ranking. The clipping demonstrates a period of negative information involving political and economic events subject to comparative analysis between CRA reports. Given this scenario, the research sought to analyze information asymmetries in the context of summary reports issued by Credit Rating Agencies, Standard & Poor's, Moody's, and Fitch, on the Brazilian sovereign. As the literature suggests, the study works with the hypothesis that the CRA released different information about the Brazilian sovereign state even when they launched maintenance in the same period.

The CRA's analytical reports were analyzed through content analysis to create variables and comparison categories for the research development. Through Correspondence Analysis (CA), these same variables and categories were aimed at comparing the informational content of the CRA in different periods. The CA is important because it shows the space of the CRAs in a multidimensional space based on their assessments of the Brazilian sovereign rating, which makes comparisons of informational convergences and divergences of these more accessible reports.

The research provides two central contributions. On the one hand, it shows that the asymmetry of information, often created between creditors and borrowers, can also be disseminated by the CRAs when they make information available to the market. In addition, it explores results on information asymmetry and the Brazilian sovereign, where there are few approaches and investigations in the national academic scenario on the subject. From the methodological point of view, the research proposal presents a combination of qualitative and quantitative analyzes for the study. Furthermore, it deals with the analysis of synthetic reports, the most accessible to decision-makers in the capital market, showing that one does not necessarily depend on the exclusive analysis of complex reports and robust econometric data to analyze asymmetric information.

## **2 LITERATURE REVISION**

### **2.1 Credit Rating Agencies and the Sovereign Rating**

It is known that the evaluation of bonds by Credit Rating Agencies did not start recently. According to Cantor & Parcker (1995), publications on titles began in 1909, when John Moody's published the first classifications of railroad titles in the USA. Later, in 1916 the classifications happened with Moody's and Poor's Publishing Company, in 1922 with the Standard Statistics Company, and in 1924 with the Fitch Publishing Company (Cantor & Parcker, 1995; White, 2010).

Since the classification activity began around the beginning of the 20th century, institutions and the State have had a growing need to adapt to the order imposed by the notion of risk in the market; this happens because these classifications are inserted within a concept of "risk and uncertainty" control (Espeland & Stevens, 1998), and this notion of risk can be associated with CRA ratings because they bring prediction, calculation, and statistics to the market.

On the global stage, CRAs play a central role in the debt markets of many countries (White, 2013). Sovereign credit ratings started in the 1970s with a few countries; emerging countries, on the other hand, began to be relevant from the 1980s onwards, when they began to be evaluated for their notorious investment capacity, serving as new options for investors worldwide (Langohr & Langohr, 2008).

The crucial role of CRAs lies in their responsibility to move financial markets through the information they emit about classifiable entities, correcting failures of asymmetric information in the market between creditors and borrowers (Ahn et al., 2014). Moreover, depending on the classification, the liquidity conditions of traded public securities can be drastically affected, as they reveal the country's conditions through spreads or fluctuations in credit prices (Bichoffe, 2017). Therefore, access to information plays an important role and conditions a vital force on the pricing of financial assets in the capital market (Sangiorgi & Spatt, 2017).

Bartels (2019) writes that the CRA treat different regions of the world differently. For example, countries with low information asymmetry usually have high income and information quality, such as those located in North America and Western Europe, while countries with high information asymmetry have opposite characteristics (Shen et al., 2011). Usually, countries classified in investment grade are more suitable for foreign investments, being better evaluated by the market since a good evaluation of sovereign bonds is evidenced.

The classifications foresee the risks of default – bankruptcy – which the countries are subject to because they are not adequate to the evaluation criteria of the CRAs. In the market, CRA scores reveal certain characteristics of countries within a simplified categorical tool (Fourcade, 2017). Within countless political and economic variables, the strengths and weaknesses of these countries are revealed. Economic variables include, for example, inflation, GDP, external debt and some employment/unemployment indices, business environment, business structure, financial sector risk, and others. (Fitch, 2019; S&P, 2017). From the political sphere, one can point out the base factors arising from the institutions and environment in which the government operates, such as the strength of political institutions and risks related to the political scenario, such as corruption and governance (Fitch, 2019; S&P, 2017). With these variables, the evaluations issued on the countries highlight their valuation or devaluation in the face of the market and investors.

## 2.2 CRA and the problem of information asymmetry

Langohr and Langohr (2008) describe information asymmetry as the fact that two parties to a transaction do not have access to the same information. Usually, financial intermediaries, such as banks, financial consultancies, and CRA, exist with the pretext of solving these asymmetry problems (Carey et al., 1998; Hemraj, 2015). This concept seeks to correct a flaw in classical economic theory, which states that information is always symmetric and that all borrowers and lenders have similar conditions on this issue (Olegario, 2009).

Being able to correct information asymmetry problems is one of the reasons why CRAs exist (Rhee, 2015). The CRAs monitor the Credit Rating of the Issuer or payer of the evaluation itself, seeking to alert investors about the evaluated entity's vulnerabilities. Issuing the report using an issuer-pays payment style is the model used by CRAs since the 1970s (White, 2009), where the issuer of security pays for the service and, consequently, has access to the report.

For White (2018), the relationship between creditor and borrower is what moves the issue of asymmetric information, as it is where one seeks to understand the extent to which the creditor has information about the credibility of the borrower to be able to lend, and the actual condition that the borrower has to pay a loan to the lender. For this reason, most research seeks to measure information asymmetry through companies' characteristics and forecasts by CRA analysts (Tang, 2009). Other studies, such as Garmaise & Nativid (2010), seek to understand how information asymmetry impacts financial and operational activities in credit assessments of microfinance institutions, for example.

Some information asymmetry problems cause variations in the credit risk assessment of CRAs (Liao et al., 2009); this is because the information CRAs have access to is also responsible for the divergences or convergences of their ratings; this shows that asymmetric information levels occur in companies and CRA, evidencing some divided classifications (Ismail et al., 2015). These split classifications, that is, different classifications in different CRAs, happen more easily when evaluating companies with great information asymmetry problems (Livingston et al., 2005). Therefore, borrowers with a good information environment can reduce conflicts of opinion between CRAs (Park & Yoo, 2019). However, they can cause evaluation errors, confusion, and misinformation for market agents and the evaluated companies.

Even with similar evaluation systems, some details of the classification process can also differ between CRAs (Ribeiro, 2014; Park & Yoo, 2019), providing different scores for the same country, for example. The premise of the problem may be related to the different methods for judging each evaluated criterion (Ribeiro, 2014), having as an impasse the result of asymmetric evaluations between the CRA themselves. Bartels (2019), for example, when analyzing why CRAs disagree about a country's sovereign default risk, indicates that the frequency of classifications and the different methodological evaluation models bring imbalance and uncertainty about the classifications. For the author, the frequency of split classifications and their imbalances result from uncertainty and the use of different classification methodologies.

The cycles of grades awarded are essential factors to consider in this problem. For example, for Broto and Molina (2016), classification cycles are highly asymmetrical, as their duration and amplitude differ in downgrades; this happens because recovering from downgrades is a slow process that takes time, however, to fall to that level, the process is much faster. Thus, the time required often affects the analysis of each CRA on a given sovereign.

Even being an organizational field with more than 100 years in the market, CRA are still uncertain, especially due to the informational content of their assessments for the market. In the literature, studies such as White (2011) and Lugo et al. (2015) associate the CRA and the veracity of their information with the international economic crises that occurred in society, such as the Subprime crisis in 2008. In addition, many of the prerogatives are related to the ability of the CRA to identify fraud or business omissions in their reports (Bichoffe, 2017) and the real credibility of information about borrowers.

Finally, the asymmetry of information between the CRAs can become a bottleneck for the market that is always looking for supervision of the quality of securities. Differences between the CRA may occur concerning the assessment of the political or economic scenario, as well as the positive, negative, or stable perspectives of a certain analyzed aspect; other examples are when one or more CRAs downgrade a sovereign to investment grade and another/others maintain it; when grades diverge on the grid; or when, in the same period of release, it presents divergences of analyzes in the notes.

### **3 RESEARCH METHODOLOGY**

The research is descriptive (Thomlison, 2001), carried out using the historical analysis method (Rowlinson, 2005), and centered on a qualitative (Holosko, 2010) and quantitative (Solomon & Draine, 2010) approach. The documentary research (Silveira & Córdova, 2009) comes from synthetic reports issued by the CRA to the financial market.

The historical outline of the research begins in 2014, when the country started to fall into the investment grid and continues until 2019, the pre-pandemic period of Covid-19. The

cut is essential because it demonstrates a period of negative information surrounding political and economic events exclusive to the country, such as the economic crisis, loss of investment grade in 2015, impeachment in 2016, pre-election tensions, and the inauguration of the right-wing government in the country. Between April 2020 and July 2022, the CRA issued 11 maintenances, but for analysis, it is unjustifiable, as it covers the period of the Covid-19 pandemic crisis, a different problem that covers everyone and not just the country.

Figure 01 presents all CRA's maintenance performed between 2014 and 2019.

**Figure 1**

*Grades issued during the survey period (2014-2019)*

Alteration	Agency	Grade	Action/maintenance
14/nov/19	Fitch	BB-	Grade maintenance and stable outlook maintenance
21/may/19	Fitch	BB-	Grade maintenance and stable outlook maintenance
07/feb/19	Standard & Poor's	BB-	Grade maintenance and stable outlook maintenance
01/aug/18	Fitch	BB-	Grade maintenance and outlook revision to stable
09/apr/18	Moody's	Ba2	Grade maintenance and outlook revision to stable
23/feb/18	Fitch	BB-	Rating downgrade and outlook revised to stable
11/jan/18	Standard & Poor's	BB-	Rating downgrade and outlook revised to stable
10/nov/17	Fitch	BB	Maintenance of the grade and maintenance of the negative outlook
26/may/17	Moody's	Ba2	Maintaining the grade and revising the outlook to negative
22/may/17	Standard & Poor's	BB	Maintenance of the grade and maintenance of the negative outlook
19/may/17	Fitch	BB	Maintenance of the grade and maintenance of the negative outlook
15/mar/17	Moody's	Baa3	Grade maintenance and outlook revision to stable
09/feb/17	Standard & Poor's	BB	Maintenance of the grade and maintenance of the negative outlook
11/nov/16	Fitch	BB	Maintenance of the grade and maintenance of the negative outlook
05/may/16	Fitch	BB	Downgrade of the grade and maintenance of the negative outlook
24/feb/16	Moody's	Ba2	Rating downgrade and outlook revised to negative
17/feb/16	Standard & Poor's	BB	Downgrade of the grade and maintenance of the negative outlook
15/dec/15	Fitch	BB+	Downgrade of the grade and maintenance of the negative outlook
09/dec/15	Moody's	Baa3	Maintaining the grade and revising the outlook to negative
15/oct/15	Fitch	BBB-	Downgrade of the grade and maintenance of the negative outlook
09/sep/15	Standard & Poor's	BB+	Downgrade of the grade and maintenance of the negative outlook
11/aug/15	Moody's	Baa3	Rating downgrade and outlook revised to stable
28/jul/15	Standard & Poor's	BBB-	Maintaining the grade and revising the outlook to negative
09/apr/15	Fitch	BBB	Maintaining the grade and revising the outlook to negative
23/mar/15	Standard & Poor's	BBB-	Maintaining the grade and revising the outlook to negative
09/sep/14	Moody's	Baa2	Maintaining the grade and revising the outlook to negative
24/mar/14	Standard & Poor's	BBB-	Rating downgrade and outlook revised to stable

Note. Data is available on the websites of Credit Rating Agencies and the website of the National Treasury. Available in: <https://sisweb.tesouro.gov.br/apex/f?p=2810:2:0>

Content analysis (Bardin, 2011) was performed on twenty-seven synthetic reports issued by the CRA. The synthetic reports selected in the pre-analysis present considerable data and information on page numbers ranging from 03 to 23. In all, 214 pages of synthetic reports were analyzed. These reports usually show two types of maintenance: maintenance of the rating note, which takes place through upgrades (elevation) and downgrades (downgrades), and outlooks, usually evaluated as stable, negative, or positive.

In qualitative and quantitative analyses, most CRA rankings reveal countries' political and economic conditions (Bichoffe, 2017; De Moor et al., 2018; Moody's, 2019; Fitch, 2019; Shahzad, 2013). Thus, in stage 1 of the analysis – floating reading and understanding of the context units – three major categories or context units were considered: Economic, Political, and Fiscal. Although the CRA assessments consider, in general, only political and economic aspects, this tax category was created/separated in order to detail the analyses. The categories also receive their respective principles or meanings at this stage. Thus, Economic refers to the

strengths and weaknesses of the country's economic issues, such as economic indicators, economic scenarios, macroeconomic conditions, etc.; Fiscal refers to the weaknesses and strengths of the country's financial and fiscal issues, such as budgets, fiscal indicators, such as fiscal deficit or surplus, public accounts, fiscal targets, etc.; and Politics, which is associated with issues in the country's political scenario, such as political crises, governance, political events, corruption, etc.

In step 2 – in-depth reading and coding – a new reading was performed when the recording units were identified and allocated within the large categories of context units. Some of these units are addressed at different times and in different ways. However, they are unified into a standard term record according to their meaning. Some reference and occurrence fragments, such as those that include "weak performance by the central bank" and "the Central Bank had little interference in the decision," for example were unified to the record "Performance by the Central Bank." Thus, the unit also receives a meaning that, in this case, "reveals the strength or capacity of the Central Bank to intervene in the country's economic decisions." For space reasons, it was impossible to conceptualize this text's recording units.

The categories and variables originate from the alignment of the CRA methodologies on the sovereign rating (Moody's, 2019; Fitch, 2019) and the indicators of fiscal and economic statistics (Banco Central, 2018; Secretaria da Fazenda, 2018), which are based in economic theory. In summary, Figure 02 presents the categories of context units and the main CRA analysis record units.

**Figure 2**

*The three categories of context units and the main recording units that characterize them*

Economic
Economic activity; Action of the Central Bank; Domestic scenery; Macroeconomic conditions; Economic growth; Economic performance; Loans to public banks; GDP indicators; Economic indicators; Domestic market; External market; Credit metrics; Reform approval process; Economic recession; Economic recovery; Resilience to external shocks; Capitalized banking system; Selic Rate; Petrobras conditions; Investor confidence; GDP; Diversified economy; Family debt; Investment indicators; Labor market; External market - trade balance; Credit profile; Economic policies; Inflation rate; Approval of the pension reform; Approval of renovations.
Fiscal
Tax conditions; Cost cutting; Tax credibility; Fiscal deficit; Interest on revenues; Fiscal targets; Budget; Fiscal policy; Proposed fiscal measures; Basic interest rates; Approval of fiscal measures; Budget Approval; Commitment to fiscal measures; Government expenditures; External finance; Public finances; Debt indicators; Fiscal indicators; fiscal policy and adjustment; International reservations; fiscal surplus
Political
Administration of the Temer government; Congressional Reform Agenda; Political scenario/Political environment; Congress support; Michel Temer case; Political consensus; Political credibility; Political crisis; Dialogue with congress; Governance; Lava Jato investigations; Dilma's popularity; Dilma's impeachment; Political uncertainties; Administration of the Dilma government; Government commitment; Economic commitment; Conflict between government and congress; Party conflicts; Political correctness; Corruption; Corruption of politicians and companies; Political decisions; Dialogue in Congress; Presidential elections; Political institutions; Government transparency; Administration of the Bolsonaro Government

Note. Based on the content analysis of the synthetic reports (2022).

In the 27 synthetic reports analyzed, it was possible to identify and categorize 80 registration units that are distributed in different maintenance periods and different periods. Most of these units are repeated when analyzed from one maintenance or report to another, even when it comes to the same period. Thus, 507 registration unit categories were counted at the end of the identification. It is important to highlight that the CRA evaluates these units with positivity, pessimism, or stability. Thus, it was considered to standardize these evaluations into three categories: Positive, Negative, or Stable, and evaluate the CRA.

## Organization of categories and variables

Given the particularity of the data and the number of categories that complement the context units evaluated by the CRA, three "statistical variables" were created and standardized (Hair et al., 2009). According to the authors, it is a set of categories organized by allocating weights/scores. Thus, a Matrix (Johson & Wichern, 2007) of data was created in Excel with three columns (variables), and 507 rows (categories) as all categories were identified and categorized.

Variables and categories were named in abbreviations to facilitate analysis. For example, in the first SPHERE variable (evaluated sphere), it was decided to transform the registration units into three unique categories: Economic, Fiscal, and Political: Example: economic performance unit, identified as Economic (Eco); fiscal deficit unit, identified only as Fiscal (Fisc); and corruption unit, identified himself as Politico (Poli). The solution also excludes any interpretive bias error from the recording units.

Positive, Negative, and Stable evaluations (Posi, Negat, and Stab) were also incorporated into the SPHERE variable. Thus, if an Economic category is identified as Positive, it is coded as PosiEco, and so on. In short, the SPHERE variable that identifies both the unit analyzed and the assessment content was structured into nine categories.

PosiFisc – Identifies categories of the tax sphere evaluated positively

NegatFisc - Identifies negatively assessed tax sphere categories

StabFisc - Identifies categories of the fiscal sphere evaluated in a stable way

NegatEco - Identifies categories of the negatively evaluated economic sphere

StabEco - Identifies categories of the economic sphere evaluated in a stable way

PosiPoli - Identifies categories of the political sphere evaluated positively

NegatPoli - Identifies negatively evaluated categories of the political sphere

StabPoli - Identifies categories of the political sphere evaluated in a stable way

The variable AGEN\_YEAR identifies the Agency and the year the maintenance was launched. This variable contains 16 categories since Fitch did not release a report in 2014 and Moody's did not release it in 2019. Thus, we have:

Stand2014 - Identifies SPHERE categories counted in S&P's 2014 summary reports.

Stand2015 - Identifies SPHERE categories counted in S&P's 2015 summary reports.

Stand2016 - Identifies SPHERE categories counted in S&P's 2016 summary reports.

Stand2017 - Identifies SPHERE categories counted in S&P's 2017 summary reports.

Stand2018 - Identifies SPHERE categories counted in S&P's 2018 summary reports

Stand2019 - Identifies SPHERE categories counted in S&P's 2019 summary reports

Moods2014 - Identifies SPHERE categories counted in Moody's 2014 summary reports.

Moods2015 - Identifies SPHERE categories counted in Moody's 2015 summary reports.

Moods2016 - Identifies SPHERE categories counted in Moody's 2016 summary reports.

Moods2017 - Identifies SPHERE categories counted in Moody's 2017 summary reports.

Moods2018 - Identifies SPHERE categories counted in Moody's 2018 summary reports

Fitch2015 - Identifies SPHERE categories counted in Fitch's 2015 summary reports.

Fitch2016 - Identifies SPHERE categories counted in Fitch's 2016 summary reports.

Fitch2017 - Identifies SPHERE categories counted in Fitch's 2017 summary reports.

Fitch2018 - Identifies SPHERE categories counted in Fitch's 2018 summary reports

Fitch2019 - Identifies SPHERE categories counted in Fitch's 2019 summary reports

In the SCORE variable, the weights of how many times the SPHERE categories were simultaneously counted in the AGEN\_YEAR are assigned. In this way, the model of the organization of variables and categories in the final Matrix is presented in the Table, with three columns and 117 lines, where the total sum of the SCORE is equal to 507.



**Table 1**  
*Analysis Matrix Model*

AGEN_YEAR	SPHERE	SCORE
Stand2014	PosiFisc	1
...	NegatFisc	8
...	StabFisc	1
...	PosiEco	3
...	NegatEco	3
...	StabEco	9
...	PosiPoli	1
...	NegatPoli	3
...	StabPoli	1
Stand2015	...	...
Stand2016	...	...
Stand2017	...	...
Stand2018	...	...
Stand2019	...	...
Moods2014	...	...
Moods2015	...	...
Moods2016	...	...
Moods2017	...	...
Moody2018	...	...
Fitch2015	...	...
Fitch2016	...	...
Fitch2017	...	...
Fitch2018	...	...
Fitch2019	...	...
Total		507

Each category of the variable SPHERE can be counted once or several times in some category of AGEN\_YEAR. At each simultaneous reference, the categories were counted in SCORE.

For the analysis of the Matrix, the Correspondence Analysis (CA) technique was performed, which is included in the ANACOR option – Simple Correspondence Analysis – in the SPSS program (Statistical Package for Social Science). CA is "known as scaling or optimal score, reciprocal mean or homogeneity analysis" (Hair et al., 2009, p. 507). The CA analyzes only two variables and their respective categories based on a measurement scale (score/weights). Correspondence Analysis is important because, as a result, it seeks to analyze the relationship between nominal categories in a multidimensional space. In SPSS, the symmetric standardization method option was used, in which it is important to look for differences or similarities between categories.

## 4 RESULTS AND DISCUSSIONS

### 4.2 Results of the analysis and the experience of the Brazilian sovereign rating (2014 - 2019)

The CA result presented eight dimensions for analysis. The relevance of the dimensions can be measured from the proportion of inertia, which can also reveal the contribution (degree of explained variance) each category has for analysis through the row and column calculation (Hair et al., 2009).

In dimension 1, there is a proportion of 57.8% of inertia, while in dimension 2, there is a proportion of 12.7%; this means that only the first two dimensions explain 70.5% of the data in the multidimensional space. Table 2 shows the proportion of inertia for each dimension.

**Table 2**  
*Inertia ratio for each dimension*

Dimension	Inertia	Chi-square	Sig.	Inertia ratio	
				Accounted for	Cumulative
1	0,213			0,578	0,578
2	0,047			0,127	0,705
3	0,038			0,102	0,807
4	0,033			0,089	0,896
5	0,018			0,048	0,944
6	0,011			0,03	0,974
7	0,007			0,020	0,993
8	0,002			0,007	1,000
Total	0,368	186,761	0,000 <sup>a</sup>	1,000	1,000

Note. For proportions in %, multiply the values in the table by 100. a. 120 degrees of freedom. Significance < 0.05 (Hair et al., 2009), that is, there is an association between the variables.

An ideal proportion is that the total inertia of the dimensions corresponds to at least 20.0% for the analysis to be considered compensatory. As shown in Table 1, the CA showed that 36.8% of the total variance in the dimensions helps explain the data, which makes the analysis satisfactory. The scores on the dimensions serve as coordinates to distribute the variables and categories in the correspondence map (Hair et al., 2009), in addition to showing the categories with the greatest weight of inertia and contribution.

Although the main explanatory background of the CA is that the closer the categories are in the dimension, the more related they are, it is important to highlight the categories that had greater relevance in the proportion of inertia and, therefore, contribution to guide the analyses. For reasons of space, Table 3 presents only the highlighted categories.

**Table 3**  
*The proportion of inertia of relevant categories.*

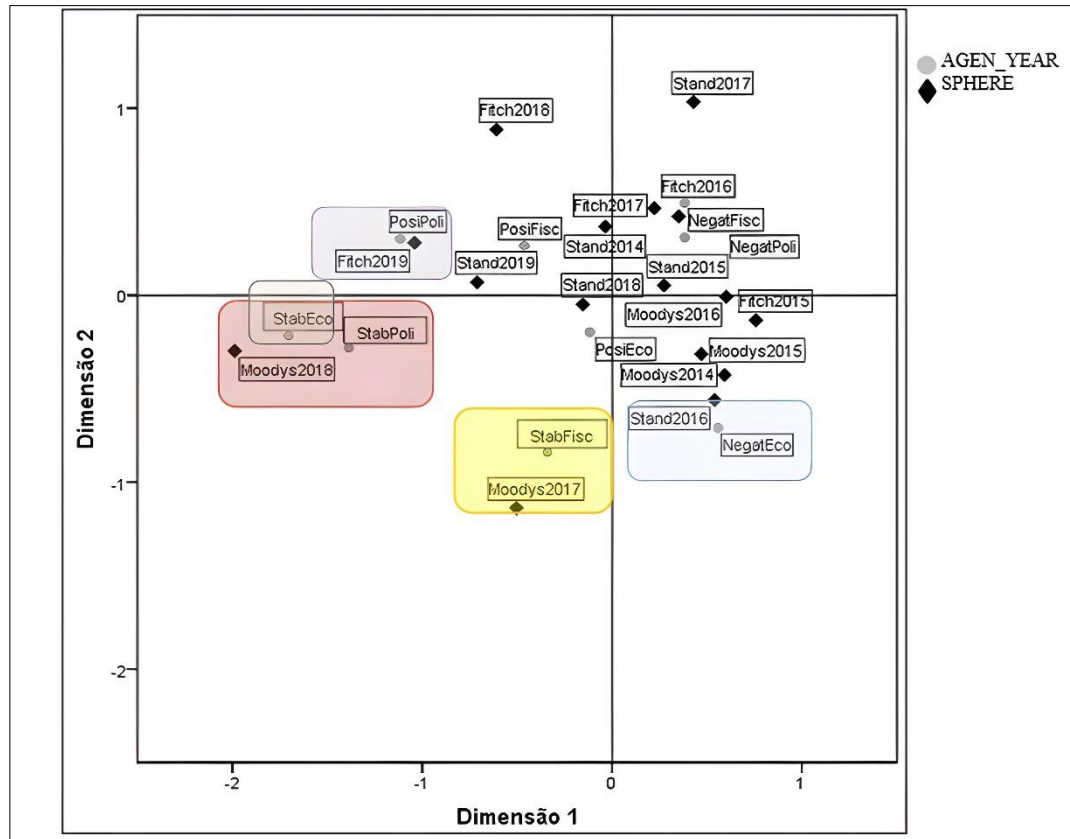
Category	Inertia	Dimension score		Dimension point contribution	
		Dim 1	Dim 2	Dim 1	Dim 2
Moodys2018	0,084	-1.988	-0,299	0,389	0,019
Fitch2019	0,045	-1.041	0,280	0,176	0,027
StabEco	0,083	-1,703	-0,216	0,360	0,012
PosiPoli	0,058	-1,115	0,302	0,186	0,029
NegatEco	0,056	0,558	-0,710	0,136	0,469

Note. For proportion in %, multiply table values by 100. Dimension score = position/coordinate on map. Sign (-) = left or bottom.

The categories that best represent the analysis, based on the value of inertia, are Moodys2018 (8.40%), StabEco (8.30%), PosiPoli (5.80%), NegatEco (5.6%), and Fitch2019 (4.50%). Note that dimension 1 (horizontal) has two sides, left and right; dimension 2 (vertical) presents the upper and lower sides. Thus, based on the contribution of the categories, in dimension 1, on the left side, three categories of the AGEN\_YEAR and SPHERE variables draw attention, namely: Moodys2018 (38.90%), StabEco (36.00%) and StabPoli (18.00%). 60%). In dimension 2, lower side, the categories NegatEco (46.90%) and StabEco (36.00%) stand out; on the upper side, the Fitch2019 (17.60%) and PosiPoli (2.90%) categories. In Figure 3, the multidimensional space of variables and categories is presented.

According to the map, it is considered that the evidence of convergent information is given by the proximity of the CRA in the same period. Example: if Fitch2017 gets close to Moodys2017 and Stand2017 through a common SPHERE category.

**Figure 3**  
 Column and row points: multidimensional space



In 2017, Moody's (Moods2017), which is positioned on the lower left side of dimension 1, tends to have a greater relationship with a stable analysis of the country's fiscal situation (StabFisc), something that other CRAs do not focus on in the same year; instead, Stand2017 is on the opposite side of the map. On the right side of this dimension, Moodys2015 and Moodys2016 are closer to Fitch2016 when related to any evaluated aspect since no SPHERE category characterizes them.

On August 11, 2015, in Moody's publication titled "Moody's Downgrades Brazil's Rating to Baa3 from Baa2; perspective is changed to stable", the Agency points out: "the ability to withstand external financial shocks because of the abundant international reserves" (Moody's, 2015, p. 03) when referring to the positive points of the Brazilian sovereign. In another report issued in 2017, which changed the outlook for the rating to stable from negative, Moody's cites that the decision was taken "due to the economy, which is showing signs of recovery, falling inflation and the fiscal scenario is more clear" (Moody's, 2017, p. 01). The CRA justifies that the perspective is related to economic recovery due to the performance of Temer Government, which invested in "economic reforms" (Ibidem). President Michel Temer's government began in 2016 when he took over as an interim government after the impeachment of President Dilma.

The map also shows that Moodys2018, the category with the highest contribution (38.90%) in dimension 1, on the left side of the map, distances itself from the other agencies in 2018, especially in terms of political (StabPoli) and economic (StabEco) analysis, which he considers stable. Characterized by a more positive perspective of the political scene, it is closer to Stand2018 and largely distances itself from Fitch2018, which is negative in these

scenarios. Moody's did not release a report in 2019, which is characterized as a problem with the CRA maintenance cycle time.

Between 2014 and 2015, an evaluation pattern happened with Standards & Poor's. The Agency's assessments stand out for analyzing the country's political situation more negatively (NegatPoli), something Fitch also sees (Fitch2015). In March 2014, for example, Standards & Poor's downgraded the rating in Brazil to speculative grade, and on September 9, 2015, it downgraded one more rating, maintaining the harmful content of the ratings. Although Fitch also gave the speculative degree in the same year, Moody's only came to define this degree in 2016, reaffirming a problem of asymmetry over time.

In 2016, S&P stood out for its negative assessment of the economic scenario in Brazil. However, on the Stand2016 side, the NegatEco category is the most significant contributor on the lower side of dimension 2, with 46.90%. This means that for a convergence of information between the CRAs, Fitch2016 and Moodys2016 would have to be closer to these two categories, which does not happen, as both are positioned on different sides of the map. For example, on the right side of dimension 1, Fitch2016 is more related to negative fiscal conditions (NegatFisc), while Moodys2016 is unrelated to any category that characterizes it.

The year 2016 was marked by demonstrations and a strong political crisis arising from the impeachment process of President Dilma Rousseff on charges of fiscal responsibility. The problem is based on the negative condition of the then government's management of acting with fiscal and economic measures and resolving political differences. As even ponders Standards & Poor's in a report published on 02/17/2016, the (economic) measures are complicated by the ongoing impeachment process of President Dilma Rousseff in Congress (S&P, 2016).

Fitch2019, the category with the highest contribution (17.60%) on the left side of the map, distances itself from the other CRAs in the same period. However, especially characterized by the positive political evaluation (PosiPoli), it has little to do with Stand2019. In 2019, the market was positively surprised by the actions of President Bolsonaro, a right-wing government that was inclined to meet its needs with a commitment to pursue reformist proposals, such as pension, labor, and tax reforms.

Fitch2018 and Stand2017 do not show considerable forces of inertia in space nor close relation to other categories. This means that in these periods, both CRA maintain a different assessment from the assessments previously granted by themselves and by the others in those same years.

## 4.2 Discussion of Results

The analysis categories objectified in Figure 03 show the convergences and divergences that occur in the informational content that the CRA make available to the market. The results show that the CRA presented information asymmetries, especially since many of their analyses, even published in the same periods, have some differences in the content of evaluating the spheres analyzed. As discussed, some justifications for these impasses may be related to the assessment methods of the CRA themselves that differ from each other (Ribeiro, 2014; Park & Yoo, 2019), the duration of the assessments (Broto & Molina, 2016), or even about the conflicts of information to which the CRA have access (Liao et al., 2009; Bartels, 2019).

The results reflect that the asymmetry of information, which is often created between creditors and borrowers (Ahn et al., 2014), can also be disseminated by the CRAs when they make information available to the market. This problem may indicate a vicious circle in which the information asymmetry between creditors and borrowers does not end; it only changes the

source of information. Although CRA exists to minimize information asymmetries (White, 2018), they can also come from an inevitable informational confusion between themselves.

The relationship between the lender and the borrower that drives the problem of asymmetric information (White, 2018) can be diffuse in the position of the CRA. It can be seen, for example, that Standard & Poor's was the agency that stood out the most in the analyses, as it is the one that is positioned more freely on the map and maintains a more negative content concerning the spheres evaluated in different years; this happens because Standard & Poor's is the most independent CRA among the three and provides lower and more volatile ratings (Alsakka & Ap Gwilym, 2010).

From the analyses, it is evident that information is a vital force on prices traded in financial markets (Sangiorgi & Spatt, 2017) and that some categories of CRA that distance themselves from each other can influence how companies and investors analyze investments. Although it seems insignificant, this disagreement can have numerous effects on the market (Jung & Park, 2018) and investors' decision-making since the publication time of CRA can take months and even years.

Finally, although the scenarios change from one year to the next, it was expected that there would be more convergence of evaluations in the spheres of analysis and that the categories of CRA and year would approach at least one category in common. On the contrary, even with harmful content in most analyses, the CRA are positioned on opposite sides in many categories of the same period.

## 5 FINAL CONSIDERATIONS

The research aimed to analyze the asymmetries of information in the content of the synthetic reports issued by the Credit Rating Agencies Standard & Poor's, Moody's, and Fitch on the Brazilian sovereign rating. The applied methodology and the results proved to be highly rewarding for research. First, the hypothesis that CRA released different types of information, even when considering the same maintenance release period, was confirmed. Although the CA has shown some similarities in content, especially regarding the pessimism of the analyzed spheres, it is evident that the asymmetry is more predominant between the CRA in the analyzed periods and categories.

Second, the research provided two central contributions. On the one hand, it shows that the asymmetry of information often created between creditors and borrowers can also be disseminated by CRAs when they make information available to the market. In addition, it explores results on the Brazilian sovereign, which few approaches and investigations in the national academic scenario have sought to penetrate.

From the methodological point of view, the research proposal presents a combination of qualitative and quantitative methods for asymmetry analysis. In addition, it deals with the analysis of synthetic reports, that is, the most accessible to decision-makers in the capital market, showing that one does not necessarily depend on the exclusive analysis of complex reports and robust econometric data to analyze asymmetric information. The proposed model is easy to reproduce and can usually be replicated to expand research on CRA information asymmetry on corporate market ratings and other financial products; this facilitates further analysis of the CRA since access to complete reports is limited. Although CRAs index is a highly restrictive style of information, it is believed that science can explore other research gaps in this way.

For theory, it is suggested, through this research and methodology, to carry out others that consider a more significant number of reports, analysis variables, and other periods such as those of the Covid-19 pandemic. In addition, it is suggested to extend the research proposal

with the inclusion of empirical data on corporate securities, analyzed using Multiple Correspondence Analysis (MCA). This type of analysis can cover a more significant number of variables and categories in addition to bringing more satisfactory results to the problem of asymmetry presented by this work.

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## Assimetria de informações e o rating soberano brasileiro na avaliação das Agências de Classificação de Risco

### RESUMO

**Objetivo:** analisar as assimetrias de informações no conteúdo dos relatórios sintéticos emitidos pelas Agências de Classificação de Risco (ACR) Standard & Poor's, Moody's e Fitch sobre o rating soberano brasileiro.

**Método:** realizou-se uma análise de conteúdo nos relatórios sintéticos das ACR com a finalidade de criar variáveis e categorias. Por meio da Análise de Correspondência (AC), objetivou-se essas mesmas variáveis de categorias em um espaço multidimensional para análise comparativa.


**Originalidade/Relevância:** o estudo mostra como a assimetria de informações entre credores e mutuários de títulos soberanos também pode ser precedida pelas próprias ACR quando disponibilizam para o mercado diferentes avaliações sobre um mesmo produto financeiro. O resultado mostra que assimetria de informações entre credores e mutuários não finda, apenas muda a fonte de informação.


**Resultados:** os resultados mostraram que, embora o teor das avaliações tenha sido negativo nas ACR, há assimetrias em categorias específicas. A Standard & Poor's, por exemplo, foi a Agência que mais se destacou nas análises. Ela se difere das demais ACR e se posiciona mais livremente entre as categorias em anos distintos.

**Contribuições Teóricas/Metodológicas:** contribui com a integração de métodos qualitativos e quantitativos para ampliação de pesquisas sobre assimetria de informações das ACR. O estudo também analisa relatórios sintéticos, isto é, os mais acessíveis aos tomadores de decisão no mercado, mostrando que não é exclusiva a análise de relatórios complexos e dados robustos para analisar informações assimétricas. Além disso, explora resultados sobre assimetria de informações e soberano brasileiro, onde poucas abordagens e investigações teve enfoque no cenário acadêmico nacional.

**Palavras-Chave:** ACR. Brasil. Assimetria. Informações. Rating soberano.

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