Revista
Cadernos de Finanças Públicas

03 | 2024

MEASURING THE FINANCIAL CONDITION OF BRAZILIAN STATES

George Andre Palermo Santoro

ABSTRACT

Providing a tool to help managers and financial institutions improve their credit analysis. To replicate, for Brazilian states, a Financial Condition Index – or FCI, based on the research by Wang, Dennis, and Tu (2007), and then adapt this index to Brazilian fiscal rules. There is no record of a accounting index, as applied to Brazilian states. The measurement of the financial condition of the states of Brazil between 2014 to 2018, through a correlation test and factor analysis, and s empirical verification of the relations of the variables own revenue, personnel expenses, and indebtedness and the developed indices.

SUMMARY

1. INTRODUCTION

The assessment of the financial condition of subnational entities has been the object of international research since the 1990s (GONÇALVES, 2018). This study proposes utilizing two indicators, which have not yet applied to Brazilian states, in order to help financial institutions improve their credit analysis for subnational public entities. Also, this will serve as a management tool for public administrators. Thus, the two indices proposed in this research differ from the one currently existing in Brazil (CAPAG - Analysis of payment capacity established by STN Ordinance No. 501, of November 23, 2017) developed by the National Treasury Secretariat, as these indices analyze all balance sheet accounts and fiscal information of the accounting, budget, and fiscal statements established in the Fiscal Responsibility Law—LRF. This law establishes a series of fiscal rules for subnational entities, including provision for punishment in case of non-compliance (CRUZ; AFONSO, 2018).

The analysis of the financial condition of subnational entities is able to guide management so that they take sufficient decisions to correct course, making their management more efficient and effective (RITONGA, 2014). In this sense, the existence of many studies that sought to create mechanisms for the detection and assessment of the financial condition of states and local governments in different countries were indentified. Some authors elaborated indices or measures of financial condition, as was the case of Brown (1993), Wang et al. (2007), Zafra-Gomez, Lopez-Hernandez, and Hernández-Bastida (2009), Rivenbark, Roenigke, and Allison (2010), Ritonga (2014), Stone (2015), Davies, Johnson, and Lowensohn (2017), among others.

Few studies were found that had developed an index that could measure the financial condition of Brazilian subnational entities. The works of Diniz, da Silva Macedo, and Corrar (2012), Gonçalves (2018), Cruz and Afonso (2018) can be highlighted. Even so, most of the researche did not study Brazilian states, but rather municipalities, and neither did they develop a financial accounting index that was able to assess the financial situation.

Unlike the private sector, which has mature and reliable indexes to identify the financial condition of companies, the public sector is still in the process of developing this type of tool (RITONGA; CLARK; WICKREMASINGHE, 2012). Therefore, it is essential that there is a set of financial indicators which can signal economic and financial condition and, equally, guide state planning (DINIZ et al., 2012; SANTOS; PEREIRA; RODRIGUES, 2018).

Thus, the objective of this research is to replicate, in Brazil, a Financial Condition Index based on the index developed in the research by Wang et al. (2007) and to present an index

adapted by including 4 new indicators to the FCI. These indices should be able to indicate the fiscal sustainability of Brazilian states based on a set of indicators that analyze long-term Cash solvency, budget results, availability of revenue for the provision of services, and the results of the fiscal structure of the before. Thus, systematically measuring the financial health of these public entities.

Methodologically, this research is an empirical study using panel data with random effects that verified the reliability of the FCI by Wang et al. (2007) to point out the financial condition of Brazilian states. This index was also adapted with the inclusion of a new component consisting of fiscal indicators, extracted from the fiscal statements required by the Fiscal Responsibility Law and by the Accounting Manual Applied to the Public Sector of the National Treasury Secretariat – STN. This measure aimed to capture variations in the financial condition of the states, according to their degree of adherence to fiscal rules, such as the positive primary result, and thus present an alternative to the FCI of Wang et al. (2007) capable of become aware of these management behaviors.

In this study, after measuring the FCI and the Adapted FCI, the reliability of the measurements is tested, checking the correlation of the indicators to ensure that they can assess the entity's financial condition as a whole. Next, the validity of the measurement is verified through econometric analysis. Thus, the hypothesis of relationship of variables were empirically tested: own income, personnel expenses, and indebtedness and socioeconomic variables. Thus, the adapted FCI proposed in this research innovates on the research by Wang et al. (2007) and all others that replicated it among diverse countries by including a pillar with typical indicators of fiscal rules provided for in the legal system of each country.

It was found that the FCI, and the adapted FCI, are able to indicate the need for course correction in the fiscal management of a state and also to serve as a basis for managers to make decisions when there are significant variations in some of the pillars (groupings of equity composition indicators, budget and fiscal management) that make up the index.

2. THEORETICAL FOUNDATION

2.1. *The importance of the governmental financial condition financial condition measures*

According to Wang et al. (2007), there are some definitions of financial condition found in

the literature, which can vary from general to specific and be directly associated with the government's capacity to adequately provide services to the population. In some situations, financial condition can be defined by analyzing net assets, equity or even cash flows, all measured by cumulative financial changes.

Ritonga (2014), based on accounting data from Indonesian municipalities, confirmed the direct relationship between the financial health of subnational entities and the capacity of these governments to adequately finance the provision of services to the population. In the short term, local infrastructure is affected by community preferences, specific demographic characteristics, and the wealth and strength of the local community in terms of public goods and services (WANG et al., 2007). Therefore, understanding why a Brazilian state reached a fiscal stress situation is very relevant.

With regard to measures of financial condition, the use of a Financial Condition Index – FCI model has been tested in several studies over the last 25 years (BROWN, 1993; HENDRICK, 2004; DENNIS, 2004; WANG et al., 2007; ZAFRA-GOMEZ et al., 2009; RIVENBARK et al., 2010; RITONGA et al., 2012; RITONGA, 2014). However, which of these studies used a set of different indicators seeking to prioritize their aspects. Nevertheless, by exposing the financial condition of the local government, leads to the possibility of social control increased due to the increase in transparency (RITONGA et al., 2012).

Wang et al. (2007) developed a financial condition index that addressed four solvency dimensions. Cash solvency, directly related to the availability of sufficient resources to cover the entity's short-term expenses arising from financial management. Budget solvency, related to the state entity's ability to generate sufficient revenue to finance its current or desired service levels. Long-term solvency, relating to the impact of existing future obligations on the resources to be earned. And service-level solvency, linked to an organization's ability to provide a service to citizens in the standards they desire and demand (WANG et al., 2007).

Thus, FCI Wang et al. (2007) managed to analyze all the balance sheet accounts of a public entity, thus providing a more complete and refined analysis of financial health. This allows better inputs for the decision-making process of government management. Thus, we can highlight the evolution of studies on the financial condition of subnational entities over time. The following studies was thus identified: Brown (1993), Hendrick (2004), Dennis (2004), Wang et al. (2007), Rivenbark et al. (2010), Ritonga et al. (2012) and Ritonga (2014), Zafra-Gomez et al. (2009), Rivenbark et al. (2011), Arnett (2011), Ritonga (2014), Clark (2015), Stone (2015), Zhang, Gibson and Schafer (2017), Davies et al. (2017), Gonçalves (2018), Cella and Zanolla

(2018) and Cruz and Afonso (2018).

2.2. Factors affecting the financial condition

From the 1990s onwards, there has been a significant amount of empirical studies that analyze the repercussions of fiscal decentralization on economic growth and on the financial condition of subnational entities (BASKARAN; FELD; SCHNELLENBACH, 2016). Some absolutely closed using only entity data; others were open, making correlation with environmental variables and others semi-open that used internal and environmental variables (RAMSEY, 2013). These studies identified that the financial condition is directly related to internal and external factors that affect it such as: fiscal responsibility, economic activity, and managerial and political decisions (HENDRICK, 2004; WANG et al., 2007; RITONGA, 2014). Evidence of the influence of socioeconomic, management and environmental factors such as the economic growth rate or tax revenue are directly related to the financial condition (DAVIES et al., 2017).

Dennis (2004) states in his study that the ability of a municipality to respond to the preferences and needs of its community depends on its available financial resources, which are directly related to the collection. For this, the following research hypothesis is presented below:

H1 - The financial condition of the Brazilian states is positively related to the state's own revenue collection capacity.

However, the way the evolution of the financial deconcentration process evolved in Brazil was responsible for the mismatch between income earned and responsibilities for providing services to the population (REZENDE; AFONSO, 2004). What you can see is that a large part of the budget is earmarked for spending on payroll, which is a reality for most Brazilian states and municipalities (MERCÊS; FREIRE, 2017). Thus, the growth in expenditure on payroll and salaries reflected not only the acceleration of pensions, but also a substantial increase in the number of active public servants. In addition, there was a substantial increase in the average wages paid either by unmeasured increases or by the payment of various trinkets (MENDES, 2016; HORTA, 2018).

It was thus identified that, in moments of cash slack, political pressures in some governments ended up generating uncontrolled personnel expenses (HORTA, 2018; CRUZ; AFONSO, 2018; CORREIA; NEDUZIAK, 2019). However, although part of this expenditure is rigid, a considerable portion has scope to reduce and optimize it,through the use of more modern management tools, technology, greater control of productivity, and a correct assessment of the

need for workforce (MENDES, 2016; MACIEL, 2016). Thus, the following research hypothesis is presented:

H2 - The financial condition of the Brazilian states is directly related to personnel expenses

Wang et al. (2007), on the other hand, identified that the reflection of long-term obligations, such as those arising from indebtedness and personnel expenses, affects the availability of future resources and, therefore, long-term solvency. Thus, Mercês and Freire (2017) and Horta (2018) identified that the combined effect of indebtedness, with a high budgetary commitment made to the states with worse financial conditions, to be used as the payment postponement mechanism. This transforms this unusual formula into indebtedness with suppliers and employees.

However, Zhang et al. (2018) identified that many entities resort to indebtedness in periods of fiscal stress. Thus, the entity's indebtedness is fundamental to define, most of the time, its financial solvency, and a key indicator for its financial condition. However, higher levels of public debt may imply an entity's need to finance basic services and indicate possible problems in its financial condition (ZHANG et al., 2018). Thus, the following research hypothesis is presented below:

H3 - The financial condition of Brazilian states is directly related to public indebtedness.

3. METHODOLOGY

3.1. Typology and data

This research is an empirical study. For the construction of the database referring to the 27 subnational entities for this study, it presents two cutoff points. The first concerns the standardization of public accounts through the adoption of the Accounting Plan Applied to the Public Sector (PCASP) as of 2014 (STN Ordinance No. 634, of November 19, 2013). From that year onwards, there was a convergence that the indicators will have the same standardization of information. The second cutoff point concerns the availability of information from when this study began, given that the National Treasury Secretariat database presented information up to the fiscal year 2018.

After defining the collection period, three steps are followed in order to replicate the study carried out by Wang et al. (2007) for the Brazilian states. The first concerns the construction of indices for measuring the financial condition, while the second and third concern the relia-

bility and identification of determining factors. The accounting data presented in the financial statements required by the Fiscal Responsibility Law (LRF) were used to collect the fifteen indicators necessary for the first stage, and for the collection of other accounting information from the 27 Federation Units necessary for the second and third stages. Finally, socioeconomic variables were used, namely: population, personal income, GDP per capita, personal income variation, population growth, economic momentum index, occupancy rate, change of position in the economic momentum index ranking, were collected in the bank of data from the Brazilian Institute of Geography and Statistics (IBGE). In this way, the necessary database to follow the three steps is concluded.

3.2. Measurement

The construction of the two indexes closely follows the steps constructed by Wang et al. (2007) and has three steps. The first concerns the measurement of the index. The authors selected financial indicators, widely used in the literature relevant to the measurement of financial condition, described in Table 1.

Table 1. Financial condition indicators according to Wang et al. (2007)

Pilar	Indicator	Calculation method	Objective	Concept Applied by the Authors
Cash solvency	The cash ratio	(Cash + equivalents) / current liabilities	Measures the ability to pay short-term liabilities immediately.	Higher results from these indicators indicate that total assets exceed total liabilities, so that there is a higher level of Cash solvency.
	The quick ratio (LiqMed)	(Cash + cash equivalents + accounts receivable) / current liabilities	Measures the financial condition to settle short-term commitments.	
	The current ratio	Current assets / current liabilities	It demonstrates whether the organization has or will have sufficient financial resources to honor its short-term commitments (up to one year).	
Budget solvency	The operating ratio	Total Revenue / Total Expense	It depicts the budget result earned in the financial year.	The higher the result, the higher the Budget solvency
	Surplus (deficit) per capita	Total surplus (deficits) / Population	Indicates the per capita availability of resources after payment of all the entity's expenses.	

Long-run solvency	Net asset ratio	Equity / Total assets	In the private sector it is known as the PL immobilization index. Indicates how much of the government's equity is invested in permanent assets.	Higher result between Equity and Total Assets indicates a greater Long-run solvency. The higher the result of the indicators of long-term liabilities and long-term liabilities per capita, the lower the solvency level.
	Long-term liability	Long-term liabilities / Total assets	It points out the ability of the entity's assets to pay their indebtedness	
	Long-term liability per capita	Long-term liabilities/population	Indicam o valor do endividamento de longo prazo per capita da população. É uma medida que reflete o comprometimento econômico futuro.	
Service solvency	Tax per capita	Total Tax / Population	Points to per capita tax collection. It is a measure of economic capacity utilization.	Tax revenue per capita and revenue per capita assess the weight of taxes and the weight of revenue for the population, while expenditure per capita is an indicator of the cost of service. Thus, a higher value in these indicators reveals a lower level of Service solvency.
	Revenue per capita	Total Revenue / Population	It measures the value of the entity's available income per capita, being, therefore, a measure of economic capacity.	
	Expenses per capita	Total Expenses / Population	Measures the state's per capita expenditures. It is a measure of economic repercussion that directly influences GDP.	
Fiscal solvency	Ability to Pay Debt - Primary result	Primary Result / Interest and Debt Amortization	This index indicates the financial availability that the entity has to pay off with the debt service.	The greater the result, the greater the ability to pay the debt service.
	Ability to Reduce Debt -Nominal result	Nominal result/ Consolidated Debt	It indicates the growth rate of the state's indebtedness. It is a measure that measures future financial capacity.	The greater the result, the greater the fiscal solvency and the lesser the effort to have resources available to make investments.
	Ability to meet current budget - Accounts payable	Accounts payable/Cash + Cash Equivalents	Measures the short-term financial capacity to bear the liabilities of previous years.	Higher result in this indicator infers less commitment of cash availabilities.
	Current Savings (Operational result)	Current Revenue/ Current Expense	It measures the operating result of the state and its ability to have the financial availability to pay for investment expenses and debt amortization.	A higher result in this indicator infers that the commitment of the revenue made with the executed expenses is low.

Note: Wang et al. (2007); Arnett (2011); Ritonga (2014); Cruz e Afonso (2018); Source: Elaborated by the author.

The calculation of the two indices considered that the 11 indicators for the first index and

the 15 indicators for the second index need to check the direction of the indicator. This direction is observed, as is the case with cash liquidity, which has a positive direction, that is, the higher this indicator, the better the capacity to pay short-term liabilities. Per capita expenditure, on the other hand, has a negative direction, given that the lower this indicator, the lower the cost of services, therefore, the better for the entity. Some of the variables present in the two indexes have different directions. Here, in order for them to have the same pattern, all indicators with negative direction were inverted (Y=1/X, where X is the indicator with negative direction and Y is the inverted indicator with positive direction), thus, all start to show direction positive.

Finally, the measurement takes place by extracting an arithmetic mean of the indicators as presented in equations 1 and 2 below.

$$ICF = \left(liqCaixa + LiqMed + LiqCorr + EficOpe + ROper + PLestrut \right.$$
$$\left. + OLP + \frac{1}{OLPper} + \frac{1}{RIper} + \frac{1}{RTper} + \frac{1}{DTper} \right)/11 \tag{1}$$

$$ICFadaptado = \left(liqCaixa + LiqMed + LiqCorr + EficOpe + ROper + PLestrut + OLP \right.$$
$$\left. + \frac{1}{OLPper} + \frac{1}{RIper} + \frac{1}{RTper} + \frac{1}{DTper} + ResP + ResN + RestP + RcDc \right)/15 \tag{2}$$

It is pointed out that there are, in each indicator that make up the indexes, heterogeneities that need to be corrected before calculation. For example, Acre's Revenue from Taxes per capita, which, in 2014, has a value of 1446.9 and the current savings of the same entity, in the same year, with a value of 1.1. To avoid these differences in the magnitude of the indicators interfering with the calculation of the adapted FCI and FCI, all absolute variations must be transformed into relative variations. For this, Wang et al. (2007) suggested standardization by z-score. So, this will make all of them have zero mean and unity standard deviation. This modification affects only the absolute level of variation, preserving the mathematical and explanatory qualities of each indicator.

3.3 Measurement reliability, measurement validity, econometric model and variables

With regard to measurement reliability, the second stage of the index concerns the measurement of measurement reliability. According to Wang et al. (2007) suggested that it is necessary that the indicators that make up the FCI present some degree of correlation with each other, as well as that the dimensions must present some degree of correlation with each other. For this purpose, the bivariate analysis proposed by the calculation of the Pearson correlation

was used. Additionally, for the robustness of the test, a factor analysis was applied for the FCI and adapted FCI indicators. The main benefit of this method is to find linear combinations within a multivariate analysis, being complementary to the bivariate correlation analysis, and thus encompassing the analysis of all indicators that make up the two indexes. Factor modeling is built in two parts estimated together: the first part extracts factors and the second part indicates the degree of correlation of the indicators with each factor.

Finally, regarding the validity of the measurement, the third phase of the study was the verification of the validity of the calculated indices. To this end, we tested whether the measure of financial condition was empirically associated with socioeconomic variables (control variables) believed to be associated with a government's financial condition. This criterion, also known as "predictive validity", was based on a general model of how a government's socioeconomic status might be related to its financial status. In simple terms, a stronger economy leads to enhanced financial standing and a government's financial capacity (IE, expanded revenue bases and more revenue collected), which, in turn, results in better socio-economic standing. Additionally, the empirical analysis leading to measurement validation also aims to test hypothesis 1, hypothesis 2, and hypothesis 3 of this study. That is, verifying whether the financial condition of the Brazilian states would be positively associated with the state's own revenue collection capacity and directly related to expenditure on personnel and public indebtedness, respectively.

With regard to the model, which is presented in equations 3 and 4, the constructed database has longitudinal characteristics. For the econometric calculation it is necessary to identify which is the best estimator to use, if stacked OLS (MQO), Fixed Effects Panel (FE) or Random Effects Panel (RE). It was necessary to use tests to identify among the three estimators. The first test concerns the Chow test which indicates the choice of the best estimator between OLS and FE. The second test, Breusch and Pagan, indicates the best between OLS and EA (BREUSCH; PAGAN, 1980). The third test, Hausman, indicates the best estimator between FE and RE.

The validity of the measurement was tested, as discussed above, based on the argument that financial condition is empirically associated with own income, personnel expenses and public indebtedness. For this, the model described in equations 3 and 4 is presented in order to answer the research question of this study and its respective hypotheses:

$$ICF = \beta_0 + \beta_1 lnarrec_{it} + \beta_2 lndesp_{it} + \beta_3 lnendiv_{it} + \beta_4 lnpop_{it} ++ \beta_5 lnrendap_{it} + \beta_6 lnpibper_{it}$$
$$+ \beta_7 var\_renda_{it} + \beta_8 tx\_pop_{it} + \beta_9 ime_{it} + \beta_{10} var\_tx\_ocup_{it} + \beta_{11} mudanca_{it} + \varepsilon_{it} \qquad (3)$$

$$ICFadaptado = \beta_0 + \beta_1 lnarrec_{it} + \beta_2 lndesp_{it} + \beta_3 lnendiv_{it} + \beta_4 lnpop_{it} + \beta_5 lnrendap_{it} + \beta_6 lnpibper_{it}$$
$$+ \beta_7 var\_renda_{it} + \beta_8 tx\_pop_{it} + \beta_9 ime_{it} + \beta_{10} var\_tx\_ocup_{it} + \beta_{11} mudanca_{it} + \varepsilon_{it} \qquad (4)$$

Additionally, variables that have identified outliers were winsorized (WANG et al., 2007; RITONGA, 2014; GONÇALVES, 2018) in 5% of the sample, 2.5% in the lower stratum and 2.5% in the upper stratum. Table 2 also demonstrates all the variables involved in the empirical analysis of measurement validation and its characteristics.

Table 2. Variables used in measurement validation

Variable	Type	Description	Calculation method
FCI	Explained	Index that measures the Financial Condition of Brazilian States, according to Wang et al. (2007)	The index is obtained by the average of the 11 duly standardized indicators that make up the dimensions Cash solvency, Budget solvency, Long-run solvency and Service solvency.
FCI Adaptado	Explained	Index that measures the Financial Condition of Brazilian States, according to Wang et al. (2007), plus the Fiscal solvency dimension.	The index is obtained by the average of 15 duly standardized indicators that make up the dimensions Cash solvency, Budget solvency, Long-run solvency, Service solvency and Fiscal solvency.
Lnarrec	Explanatory	It represents the entity's own collection capacity in accordance with the Federal Constitution and the National Tax Code.	Lnarrec = ICMS + IPVA + Others + Taxes + Contribution of Improvements collected in the year + Income from Financial Applications, Income from Social Contributions, Income Tax, Industrial Income, Service Income, Agricultural Income, Other current income, except for social security compensation. The variable was calculated in its logarithmic form.
Lndesp	Explanatory	Variable that indicates the size of the personnel expense.	The reference is the value of personnel expenses, according to the data disclosed in Annex 1 of the Fiscal Management Report of the States disclosed in Siconfi. This variable was calculated in the regression in its logarithmic form.
Lnendiv	Explanatory	Variable that indicates the size of the debt.	The value of the consolidated debt according to the data disclosed in Annex 2 of the Fiscal Management Report of the States. This variable was calculated in the regression in its logarithmic form.
Lnpop	Control	Variable that indicates the population size.	The reference is the estimated number of inhabitants calculated by IBGE. The variable was calculated in its logarithmic form.

Lnrendap	Control	Represents Personal Income.	Lnrendap = Average real monthly household income per capita indicates the labor income usually earned per month. The variable was calculated in its logarithmic form.
Lnpibper	Control	Indicator that helps measure the degree of economic development.	Lnpiper = State Gross Domestic Product (GDP) / Population. The variable was calculated in its logarithmic form.
var_renda	Control	Variation in Personal Income	Percentage year-on-year change in average real monthly household income per capita indicates the labor income usually earned per month.
tx_pop	Control	Variable that measures Population Growth	It is calculated from the population estimate released by IBGE. Population growth estimates are performed using the geometric method.
IME	Control	Variable that measures the Economic Moment Index (EMI).	ime_w = composed of the averages of variations in employment, income and population levels relating the performance of each entity to the national average (fixed at zero, that is, average 0 and standard deviation 1).
var_tx_ocup	Control	Year-over-year percentage change in occupancy rate.	var_tx_occup = calculated from the ratio between employed population and economically active population.
Mudança	Control	Change of Position in Economic Moment Index Ranking.	Mudança = change in occupation position in the economic momentum index ranking year by year.

Note: Regression was performed for two Explained Variables, FCI and Adapted FCI, the first replicates the Wang et al. (2007) Index, while the second adds the Fiscal solvency dimension to measure the financial condition of Brazilian states.

Source: Prepared by the author.

4. RESULTS

4.1. Measurement of the state financial condition

By analyzing the results of the "Cash solvency" pillar, which is related to effective cash management, it is identified that the vast majority of Brazilian states present results below average throughout the period analyzed. That is, they may have current liabilities greater than their short-term assets. This situation differs from that identified by Wang et al. (2007) when studying the American states, and Gonçalves (2018), who analyzed the Brazilian municipalities that had much better Cash solvency. In this regard, the states of Amazonas, Pará, Paraíba and Rondônia presented above-average results, while Goiás, Minas Gerais, Mato Grosso, Rio de Janeiro and Rio Grande do Sul were below average.

In the "Budget solvency" 44% of the states were found that had total expenditure grea-

ter than total revenue, while in the study by Wang et al. (2007), it was 57.1%. For descriptive analysis, it was necessary to remove the year 2016, as all states received extraordinary revenue from resources arising from the taxation of repatriation of resources carried out in a timely manner only in that year. The states of Minas Gerais and Rio de Janeiro presented very expressive deficits in almost every year. In 2018, Rio de Janeiro had an above-average result, as it entered the tax recovery regime provided for in Complementary Law No. 159/17 and, therefore, had suspended payments related to its debt service for three years.

The negative result in the indicator of Equity versus total capital structure is noteworthy when analyzing the "Long-run solvency" pillar of the FCI. This indicates that at least 10 Brazilian states, over the years analyzed, have unsecured assets. A different result from the study by Wang et al. (2007) who identified 75.5% of the American states with their positive relationship, but it can be explained by the fact that Brazil is experiencing a transition in its accounting records model and not all asset values are computed in the balance sheets, such as the registration of real estate assets (STN Ordinance No. 548, of September 24, 2015 establishes a deadline until 2020 for the registration of real estate assets and 2023 for infrastructure assets).

In the same way, Gonçalves (2018), when analyzing Brazilian municipalities, found positive values in this indicator for most Brazilian municipalities tested, and also in the research by Rivenbark and Roenigk (2011) who, when studying the fiscal situation of American capital cities, found a result positive. The Brazilian states, unlike the municipalities analyzed in the two studies, have a higher value of liabilities of all kinds due to their own characteristics of federative formation (FERREIRA, 1998). In addition, little of this difference is also explained by Cabello, Bilancieri, and de Azevedo (2019) by the fact that accounting accounts for equity assets adequate to international accounting standards for the public sector are not yet implemented in the country.

When analyzing the "Solvency of services" it is verified that the states located in the North and Northeast regions have the worst revenue from taxes per capita, with Maranhão having the lowest average. The states of the South, Southeast, and Midwest have the highest averages, with Brasília having the best result. Such situation of distortion of the Brazilian federative system also appears in the study by Souza Júnior and Gasparini (2006), when it is verified the availability of services below the average for the Northeast region. A given circumstance is the result of the smaller contribution of resources, despite the State Participation Fund supplying part of this deficiency (SOUZA JUNIOR; GASPARINI, 2006).

In the "Fiscal solvency" pillar, introduced in this research, it was found that the nego-

tiation of debt with the federal government in 2015, promoted by Complementary Law No. 148/2014, which reduced the debt balance with the federal government for some states and it changed the interest and correction conditions, did not greatly change the fiscal perspective of most states. This was also the conclusion of the research by Mercês and Freire (2017). Complementary Law No. 148/2014 provided, in addition to a reduction in debt service expenditures, a reduction in the stock growth rate due to the change in the index. In addition, States had a great cash relief, as they did not pay the debt for six months and then the installments had decreasing discounts until July 2018, when they returned to paying normally (MERCÊS; FREIRE, 2017).

The indicator "Compliance with the Current Budget" points to the States that compromise the availability of future cash to cover past debts. There was a slight improvement in this indicator, as in 2014 only 4 states were positive and, in 2018, this number rose to 9. This apparent improvement must be related to surplus cash from debt renegotiation than with the improvement of its fiscal structure, which has been deteriorating due to greater budget commitment to personnel expenses Horta (2018). The problem of the continuous increase in personnel expenses is evident, as some states are no longer able to finance part of these expenses within a financial year (MERCÊS; FREIRE, 2017).

As we can see (Table 3), there is a large discrepancy between Brazilian states in terms of financial condition, considering the standard deviation value and the difference between the maximum and minimum values.

Table 3. Descriptive statistics of the indices for the 26 states and the federal district

Index	Year	N	Mean	SD	Min	P25	P50	P75	Max
	2014	27	0	0,544	-0,688	-0,366	-0,159	0,245	1,467
	2015	27	0	0,543	-0,889	-0,429	-0,027	0,305	0,922
FCI	2016	27	0	0,576	-0,989	-0,448	0,065	0,380	1,292
	2017	27	0	0,618	-0,752	-0,537	-0,095	0,369	1,430
	2018	27	0	0,538	-0,761	-0,476	0,000	0,251	1,423
	2014	27	0	0,480	-0,657	-0,327	-0,137	0,196	1,471
	2015	27	0	0,442	-0,810	-0,377	0,048	0,332	0,796
Adapted	2016	27	0	0,480	-0,825	-0,334	0,002	0,319	0,930
	2017	27	0	0,503	-0,736	-0,376	-0,064	0,302	1,129
	2018	27	0	0,452	-0,769	-0,368	-0,010	0,303	1,104

Source: Information extracted from the accounting statements released by STN.

The ranking of states in terms of financial condition was calculated for the adapted index. It can be seen that over the period analyzed, at least 10 states have always had rates below average, which may indicate a higher medium-term fiscal risk for these entities. because they did not present availability of resources in the short term, or ability to obtain an increase in revenue, or have future economic commitment. In the same sense as pointed out in the study

by Horta (2018). In 2014, 17 states were identified with the FCI adapted below the average, while in 2018 it became 13. Thus, it is assumed that the average financial condition of Brazilian states, over the five years analyzed in this study, improved in the FCI and in the Adapted FCI. Only 7 states, for the study period, always presented an index above the average, a fact common to them is the low indebtedness. Only three states that presented below-average results in 2014 managed to have substantial improvements: Alagoas, Espírito Santo, and Rondônia. This confirmed what was pointed out in the research by Correia and Neduziak (2019) that the fiscal reactions of the states are different, with no homogeneity in the budget adjustments to contain the indebtedness of state entities. Each one reacted differently to the renegotiation of the debt with the Federal Government. Another interesting point identified by the data is that the nature of the liabilities influences the FCI. Some states, such as Rio Grande do Norte and Piauí, which, despite having an above-average FCI, are experiencing financial difficulties in the short term, as they have a high commitment of their income with the payment of salaries. Thus, the FCI points out that it is easier for these states to improve than, for example, Minas Gerais and Rio Grande do Sul, as in addition to the short-term difficulty resulting from the high commitment of their payroll revenue, they still have high indebtedness.

To analyze the reliability of the proposed measurement, it was necessary to examine the association of the dimensions that make up the FCI and the FCI adapted to each other. The results of the Pearson correlation analysis demonstrate that the dimensions used to measure financial condition in this study are associated with each other and that the indicators in each dimension are also associated (WANG et al., 2007; GONÇALVES, 2018). In general, Pearson's analysis indicated that there was a positive correlation between most pillars when taking into account those coefficients that were at least 10% significant. This result corroborates the proposal that dimensions must be at least positively correlated so that they can measure the same condition (WANG et al., 2007).

In addition to assessing the association for dimensions and indicators within each dimension, this study also examines whether indicators can be grouped individually to assess financial condition. The cash ratio has a strong positive correlation (0.77 and 0.98 respectively) with the current ratio and the quick ratio. Likewise, the operating ratio has a strong positive correlation (0.82) with current savings (Operational result). Furthermore, it is observed that most indicators, with at least 10% significance, are positively correlated with magnitudes ranging from moderate to strong. This result corroborates the proposal by Wang et al. (2007) in which the indicators are correlated, demonstrating that the general index can measure the financial condi-

tion, through the Pearson correlation analysis between the indicators in part 2.

Additionally, to know whether the index can measure financial condition in a broad way, it is necessary to identify whether, individually, each indicator can preserve its individuality together within the index.

The proposal by Wang et al. (2007) suggests the use of Cronbach's Alpha Coefficient which indicates a coefficient of 0.79 for the adapted FCI and 0.80 for the FCI. It is understood that this is quite reasonable, given the sample size, as the minimum acceptable value for alpha is 0.70, with 0.90 being the expected maximum (CERVANTES, 2005). In the research by Wang et al. (2007), the result was 0.81 for the American states and 0.72 for cities above 250 thousand inhabitants, that is, a variability based on the sample size. Thus, the FCI and the adapted FCI indexes are within the reliability standards of the Wang et al. (2007) survey. Then, factor analysis completes the measurement reliability analysis procedure (WANG et al., 2007). Its main function is to give robustness to the two-by-two analysis that Pearson's correlation provides. Through factor analysis, it is possible to identify those three factors (factor 1, 2 and 3) account for more than 82.6% cumulative variation of the adapted index. Through the correlation analysis between the indicators, it is possible to observe that the linear dependence between the indicators forms 9 factors, with a strong level of individual relevance, for the general index. And it is possible to identify which indicators are most strongly related to each of the factors.

The correlation between the factors and indicators that Cash liquidity (0.858), The quick ratio (0.871), The current ratio (0.721) and long-term obligations per capita (0.700), in addition to Tax revenue per capita (0.608), Total Revenue per capita (0.626) and Total Expenditure per capita (0.699) are strongly related to factor 1. This may suggest that the main factor behind the financial condition of an entity is linked to its availability of resources in the short term, its ability to earn income and its indebtedness.

The FCI behaves very similarly, demonstrating that 92% of the variation in the index is composed of 3 factors (Factor 1, 2 and 3). And it is verified in the correlation analysis between the indicators and the FCI factors that the indicators related to the cash liquidity of the states account for a large part of the index result – Factor 1. In the same way as pointed out in the studies by Maciel (2016) and Tollini (2016). Also, identically to the FCI, the Adapted FCI demonstrates the same 6 indicators strongly related to the first factor.

4.2. Measurement validity: factors determining the financial condition - empirical analysis

The use of regression analysis allowed us to verify the dependence relationship of the dependent variable (FCI and Adapted FCI) and the multiple independent variables used in the research when analyzing the financial years 2014 to 2018.

The results obtained in the tests for choosing the best estimator. In detail, it was verified that both the Breusch-Pagan test and the Hausman test reveal the same result. Which implies the indication of the use of panel data with random effects as the estimator that best fits the data of the two indices proposed here.

Another test applied here is the Pesaran cross-dependence test (2020) and in it the null hypothesis is the presence of cross-sectional independence. The results obtained indicate that both the variables present in the FCI model (test p-value: 0.1253) and in the Adapted model (test p-value: 0.159) do not reject the null hypothesis of transversal independence of the regressors. Therefore, statistically it is indicated that the two models have independent and identically distributed residuals, not showing multicollinearity or autocorrelation. Once the method of data calculation is chosen, the estimated parameters in Table 4 are shown. In general, an explanatory power above 70% is seen in the two estimated models, explaining 73.0% and 71.94% in the FCI Adapted and FCI respectively of performance. It also presents a high level of joint statistical significance for all regressions, with R^2 and Wald results confirming the goodness of fit and statistical significance, as is also evidenced in the literature (BROWN, 1993; WANG et al., 2007; RITONGA, 2014; GORINA; MAHER; JOFFE, 2017).

Table 4. Results of random effects regressions

Variable	FCI Adapted	FCI
lnarrec	-0,013	-0,076
lndesp	-0,685***	-0,515**
lnendiv	-0,295***	-0,515***
lnpop	0,749***	0,854***
lnrendap	1,049***	1,217***
lnpibper	-0,532***	-0,744***
var_renda	-1,118**	-0,776
tx_pop_w	-3,325	-10,547
ime_w	0,047	0,082
var_tx_ocup	0,033	0,160
mudanca	0,001	0,008
constante	9,397***	9,856***
No. of Observations	135	135
R² (Overall)	0,7300	0,7194
Wald (F)	96,04***	136,05***

Note: *P<0.1; **P<0.05; ***P<0.01

Source: Prepared by the author

The lack of significance of the variable own collection (lnarrec) in the two proposed indices, called in this research "Adapted" and FCI by Wang et al. (2007), is also highlighted, different from the one identified in the research by Gorina et al. (2017) who linked governments with a greater capacity for their own collection to lower fiscal risk. This result does not corroborate the statement that the ability to collect own revenue is positively related to the financial condition of the Brazilian states. In this way, H1 is rejected. This fact can be explained by the great imbalance in the tax burden in the Brazilian federation. In which some States are already within the efficient collection limit of their main ICMS tax (REZENDE, 2018).

Thus, the explanatory variables that measure the fiscal risk of the Brazilian states, personnel expenses (lndesp) and indebtedness (lnendiv), showed significance at the 99% confidence level in both indexes. The results of the Adapted FCI model and the Wang et al. (2007) FCI, it is identified by the negative sign that in both models, the higher the personnel expenses and indebtedness, the lower the financial condition indicator. However, personnel expenses have a greater weight in the Adapted FCI than in the FCI, because for every 1% increase in it, the adapted FCI decreases by 0.006852 and the FCI by 0.005153. Meanwhile, the influence of

20

indebtedness in the Adapted FCI is smaller, because for every 1% increase in it, the indicator reduces by 0.002946, whereas in the FCI by 0.005152. Meanwhile, such facts confirm the H2 and H3 hypotheses of this study.

Correia and Neduziak (2019) and Maciel (2016) also point out as a determining factor for the lack of control of public accounts of federal entities the disproportionate increase in personnel expenses in relation to their income. This contradicts the LRF itself, which provides for the induction of management measures to control public expenditure (TOLLINI, 2016; CRUZ; AFONSO, 2018). The findings of these studies point to a fraying of the federative financing, as the own revenues are no longer able to answer for the federative fiscal capacity of the state. Probably, this is the result of = the Federal Government's advance in the country's tax cake (RESENDE; AFONSO, 2004; HORTA, 2018; RESENDE, 2018).

It was identified that many states did not take advantage of the financial slack generated by the renegotiation of their debts with the federal government to make investments, but rather an increase in the proportion of payroll expenses in total expenditures (CALDEIRA et al., 2016; TOLLINI, 2016; MERCÊS; FREITAS, 2017). However, when analyzing the results of the Fiscal solvency pillar, it was identified that some states moved towards even reducing the share of personnel expenses as a result of their Current Revenue, which caused their financial condition to have a substantial improvement in the period. studied. Pointing out that it is possible to control the growth of personnel expenses.

5. FINAL CONSIDERATIONS

The purpose of this study was to bring an index that assesses the financial condition of Brazilian states in order to help financial institutions improve their credit analysis - the condition index developed by Wang et al. (2007). This study also provides a tool for state finance managers to be able to have a more complete diagnosis of the fiscal solvency and financial situation, as well as serve as a basis for promoting adjustments in government planning and decision-making, taking into account the economic scenarios.

In addition, it was possible to develop an adaptation of this index with the inclusion of 4 more new indicators, components of the new Fiscal solvency pillar. This allowed, although incipient due to the short period of analysis, capturing the influence of fiscal management on the financial results of each state. In fact, this innovation was able to identify that among the 10 states with the best adapted FCIs, they are those that generated the highest primary result

balances (fiscal rule provided for in the LRF).

The empirical analysis, on the other hand, sought to verify the reliability and validity of the indicators, as well as the relevance of some economic and fiscal management factors in the two analyzed models, capable of positively influencing the results of the state's financial condition, as expected by the theoretical foundation. It was identified that some economic indicators (control variables) related to their variation over time, unlike the research by Wang et al. (2007), did not confirm this influence.

The hypotheses that the state's financial condition is related to its own revenue collection capacity, the level of indebtedness and personnel expenses were also tested. The results of the Adapted FCI indicated that in the period analyzed at least 10 states always had rates below average, indicating a situation of greater probability of being in fiscal stress situation.

It is also noteworthy that in the "Cash solvency" pillar, most entities had negative results and at least 10 had unsecured assets. This points to weakness in financial planning and cash management, as they are taking on short-term obligations without having available resources to cover. Research evidence suggests that currently the biggest problem for states has been the growing commitment of their cash to pay active and inactive personnel (CAETANO, 2016; BANDEIRA; DE BRITTO; SERRANO, 2018).

This study has its limitations recognized by the fact that Brazil has not yet fully implemented international accounting standards for the public sector and by the inconsistency of some accounting information presented by the States, which made it difficult to demonstrate the importance of the fiscal pillar in the Adapted FCI.

BIBLIOGRAPHICAL REFERENCES

ARNETT, Sarah. **Fiscal stress in the US states: An analysis of measures and responses (Uma análise de medidas e respostas)**. Instituto de Tecnologia da Geórgia e Universidade Estadual da Geórgia, 2011.

BANDEIRA, Marcos Lima; DE BRITTO, Paulo Augusto Pettenuzzo; SERRANO, André Luiz Marques. Gestão fiscal dos estados brasileiros: análise dos gastos com pessoal entre 2008 e 2016. **Negócios em Projeção,** v. 9, n. 2, p. 123-144, 2018.

BASKARAN, Thushyanthan; FELD, Lars P.; SCHNELLENBACH, Jan. Fiscal federalism, de-centralization, and economic growth: a meta-analysi**s. Economic Inquiry,** v. 54, n. 3, p. 1445-1463, 2016. 10.1111/ecin.12331

BREUSCH, Trevor S.; PAGAN, Adrian R. The Lagrange multiplier test and its applications to model specification in econometrics (O teste do multiplicador de Lagrange e suas aplicações à especificação de modelos em econometria**). The review of economic studies**, v. 47, n. 1, p. 239-253, 1980. 10.2307/2297111.

BROWN, Ken W. et al. The 10-point test of financial condition: Toward an easy-to-use assessment tool for smaller cities (Para uma ferramenta de avaliação fácil de usar em cidades menores). Government Finance Review, v. 9, p. 21-21, 1993.

CABELLO, Otávio Gomes; BILANCIERI, Marco Vinício; DE AZEVEDO, Ricardo Rocha. Conformidade inicial das normas de contabilidade aplicadas ao setor público no Brasil. **Revista Mineira de Contabilidade,** v. 20, n. 3, p. 5-17, 2019. 10.21714/2446-9114RMC2019v20n3t01.

CAETANO, Marcelo Abi-Ramia. **Solvência fiscal de longo prazo dos regimes próprios de previdência dos estados e municípios.** 2016. Ipea. http://repositorio.ipea.gov.br/handle/11058/6638

CALDEIRA, Alessandro Aurélio et al. Sustentabilidade da dívida estadual brasileira: uma análise da relação dívida líquida e resultado primário. **Revista de Administração Pública**, v. 50,

p. 285-306, 2016.

CELLA, Ricardo Sartori; ZANOLLA, Ercilio. A Lei de Benford e a transparência: uma análise das despesas públicas municipais. **BBR. Brazilian Business Review**, v. 15, p. 331-347, 2018. 10.15728/bbr.2018.15.4.2

CERVANTES, Víctor. Interpretaciones del coeficiente alpha de Cronbach. **Avances en medición**, v. 3, n. 1, p. 9-28, 2005.

CLARK, Benjamin Y. Avaliando a validade e a confiabilidade do índice de condição financeira para governos locais. **Public Budgeting & Finance**, v. 35, n. 2, p. 66-88, 2015. 10.1111/pbaf.12063.

CORREIA, Fernando Motta; NEDUZIAK, Luiz Carlos Ribeiro. Reações fiscais e a dívida dos estados brasileiros: efeitos do federalismo fiscal e das regras orçamentárias. **Revista Econômica do Nordeste**, v. 50, n. 4, p. 47-62, 2019.

CRUZ, Cláudia Ferreira da; AFONSO, Luís Eduardo. Gestão fiscal e pilares da Lei de Responsabilidade Fiscal: evidências em grandes municípios. **Revista de Administração Pública**, v. 52, p. 126-148, 2018. 10.1590/0034-7612165847.

DAVIES, Stephen P.; JOHNSON, Laurence E.; LOWENSOHN, Suzanne. Influências ambientais sobre os ativos líquidos municipais: Evidence from panel data. **Contemporary Accounting Research**, v. 34, n. 2, p. 1156-1177, 2017. 10.1111/1911-3846.12280.

DENNIS, Lynda M. **Determinantes da condição financeira: A study of United States cities**. University of Central Florida, 2004. http://purl.fcla.edu/fcla/etd/CFE0000187.

DINIZ, Josedilton Alves; DA SILVA MACEDO, Marcelo Alvaro; CORRAR, Luiz João. Mensuração da eficiência financeira municipal no Brasil e sua relação com os gastos nas funções de governo. **Gestão & Regionalidade**, v. 28, n. 83, 2012. 10.13037/gr.vol28n83.1347.

FERREIRA, Ivan Fecury Sydrião. **A Economia Política do Endividamento Público em uma**

24

Federação: um estudo comparativo entre o Brasil e os Estados Unidos. Tese de doutorado, Fundação Getúlio Vargas. 1998. http://hdl.handle.net/10438/5298.

FREITAS, Déborah Chaussê; QUEIROZ, Dimas Barrêto. **Influência da Condição Financeira Sobre os Gastos com Investimento nos Estados Brasileiros.** 2019. https://repositorio.ufpb.br/jspui/handle/123456789/18222

FUNDO MONETÁRIO INTERNACIONAL. **Manual de Estatística das Finanças Públicas 2014.** Washington, DC: Fundo Monetário Internacional. 2014.

GONÇALVES, M. C. **Condição Financeira dos Municípios Brasileiros:** fatores determinantes. Dissertação de mestrado. Fucape. 2018. http://legado.fucape.br/_public/producao_cientifica/18/REVISADA%20-%20DISSERTA%C3%87%C3%83O%20MARTA.pdf

GORINA, Evgenia; MAHER, Craig; JOFFE, Marc. Local fiscal distress: Measurement and prediction. **Public Budgeting & Finance**, v. 38, n. 1, p. 72-94, 2017. 10.1111/pbaf.12165

HENDRICK, Rebecca. Avaliação e mensuração da saúde fiscal dos governos locais: Focus on Chicago suburban municipalities. **Urban Affairs Review**, v. 40, n. 1, p. 78-114, 2004. 10.1177%2F1078087404268076.

HORTA, Guilherme Tinoco de Lima. A sustentabilidade fiscal dos estados brasileiros: análise recente e notas para o futuro. **Revista do BNDES**, v. 25, n. 50, 299-344, 2018. http://web.bndes.gov.br/bib/jspui/handle/1408/16843. https://servicos2.sjc.sp.gov.br/media/544209/portaria_stn_634_2013_processo_convergencia.pdf

BRASIL. Lei Complementar n° 101, de 04 de maio de 2000 - Lei de Responsabilidade Fiscal (LRF). **Estabelece normas de finanças públicas voltadas para a responsabilidade na gestão fiscal e dá outras providências. Diário Oficial da República Federativa do Brasil, Brasília-DF, 05 de maio de 2000.** https://www.planalto.gov.br/ccivil_03/leis/lcp/lcp101.htm

BRASIL. Lei Complementar nº. 148/2014, de 25 de novembro de 2014. **Altera a Lei Complementar nº 101, de 4 de maio de 2000, que estabelece normas de finanças públicas voltadas**

para a responsabilidade na gestão fiscal; dispõe sobre critérios de indexação dos contratos de refinanciamento da dívida celebrados entre a União, Estados, o Distrito Federal e Municípios; e dá outras providências.** https://www.planalto.gov.br/ccivil_03/leis/lcp/lcp148.htm

BRASIL. Lei Complementar nº. 159/2017, de 19 de maio de 2017. **Institui o Regime de Recuperação Fiscal dos Estados e do Distrito Federal e altera as Leis Complementares nº 101, de 4 de maio de 2000, e no 156, de 28 de dezembro de 2016.** https://www.planalto.gov.br/ccivil_03/leis/lcp/lcp159.htm

BRASIL. Lei nº. 4320/64, de 17 de março de 1964. **Institui normas gerais de direito financeiro para elaboração e controle dos orçamentos e balanços da União, Estados, Municípios e do Distrito Federal.** Diário Oficial da União, Brasília, DF, 23 mar. 1964, Seção 1, p. 2745. http://www.planalto.gov.br/ccivil_03/leis/l4320.htm

BRASIL. Lei nº. 9496/97, de 11 de setembro de 1997. **Estabelece critérios para a consolidação, a assunção e o refinanciamento, pela União, da dívida pública mobiliária e outras que especifica, de responsabilidade dos Estados e do Distrito Federal.** https://www.planalto.gov.br/ccivil_03/leis/l9496.htm

MACEDO, Joel de Jesus; CORBARI, Ely Célia. Efeitos da Lei de Responsabilidade Fiscal no endividamento dos municípios brasileiros: uma análise de dados em painel. **Revista Contabilidade & Finanças**, v. 20, p. 44-60, 2009. 10.1590/S1519-70772009000300004.

MACIEL, Pedro Jucá. **O processo recente de deterioração das finanças públicas estaduais e as medidas estruturais necessárias.** Rio de Janeiro: Record. 2016.

MENDES, Marcos. **A política de pessoal do governo federal. Finanças públicas: Da contabilidade criativa ao resgate da credibilidade**. Rio de Janeiro: Record. 2016.

MERCÊS, Guilherme; FREIRE, Nayara. Crise fiscal dos estados e o caso do Rio de Janeiro. **Geo Uerj**, n. 31, p. 64-80, 2017. 10.12957/geouerj.2017.32070.

MINISTÉRIO DA FAZENDA. Secretaria do Tesouro Nacional. Portaria STN Nº 634/2013.

Dispõe sobre regras gerais acerca das diretrizes, normas e procedimentos contábeis aplicáveis aos entes da Federação, com vistas à consolidação das contas públicas da União, dos Estados, do Distrito Federal e dos Municípios, sob a mesma base conceitual. https://goias.gov.br/economia/wp-content/uploads/sites/45/2013/12/portaria-de-2013-no.-634-da-stn_mf-procedimentos-contabeis-393.pdf

MINISTÉRIO DA FAZENDA. Secretaria do Tesouro Nacional. Portaria STN Nº 548/2015. **Dispõe sobre prazos-limite de adoção dos procedimentos contábeis patrimoniais aplicáveis aos entes da Federação, com vistas à consolidação das contas públicas da União, dos estados, do Distrito Federal e dos municípios, sob a mesma base conceitual.** https://www.cnm.org.br/cms/images/stories/Links/30092015_CPU_Portaria_STN_548-2015_-_PIPCP1.pdf

RAMSEY, Tina Kim. **Measuring and evaluating the financial condition of local government (Medição e avaliação da condição financeira do governo local)**. 2013. Tese de doutorado, Universidade Estadual da Califórnia. http://hdl.handle.net/10211.9/2187.

REZENDE, Fernando. Federalismo fiscal e gestão pública. **Negri, José Alberto, Araújo, Bruno Cesar e Bacelette, Ricardo. Desafios da Nação: artigos de apoio,** p. 203-228, 2018.

REZENDE, Fernando; AFONSO, José Roberto. **A federação brasileira: fatos, desafios e perspectivas. Federalismo e integração econômica regional-desafios para o Mercosul**. Rio de Janeiro: Konrad Adenauer. 2004.

RITONGA, Irwan Taufiq. **Modelagem das condições financeiras do governo local na Indonésia.** 2014. Tese de Doutorado. Universidade de Victoria.

RITONGA, Irwan Taufiq; CLARK, Colin; WICKREMASINGHE, Guneratne. Assessing financial condition of local government in Indonesia: an exploration (Avaliação da condição financeira do governo local na Indonésia: uma exploração). **Finanças Públicas e Municipais**, v. 1, n. 2, p. 37-50, 2012.

RIVENBARK, William C.; ROENIGK, Dale J. Implementation of financial condition analysis

in local government (Implementação da análise da condição financeira no governo local). **Public Administration Quarterly**, p. 241-267, 2011. 10.2307/41506755.

RIVENBARK, William C.; ROENIGK, Dale J.; ALLISON, Gregory S. Conceptualizing financial condition in local government. **Journal of Public Budgeting, Accounting & Financial Management**, v. 22, n. 2, p. 149-177, 2010. 10.1108/JPBAFM-22-02-2010-B001

SANTOS, Nálbia de Araujo; PEREIRA, Luana Aparecida; RODRIGUES, Daniele Silva. Relação entre a Atuação dos Conselhos Municipais do FUNDEB e os Desperdícios Ativos e Passivos. **BBR. Brazilian Business Review**, v. 15, p. 460-474, 2018. 10.15728/bbr.2018.15.5.4

SOUZA JÚNIOR, Celso Vila Nova de; GASPARINI, Carlos Eduardo. Análise da eqüidade e da eficiência dos estados no contexto do federalismo fiscal brasileiro. **Estudos Econômicos (São Paulo)**, v. 36, p. 803-832, 2006. 10.1590/S0101-41612006000400006.

STONE, Samuel B. The effect of fiscal decentralization on the financial condition of municipal Government (O efeito da descentralização fiscal na condição financeira do governo municipal). **International Journal of Public Administration**, v. 38, n. 6, p. 453-460, 2015. 10.1080/01900692.2014.949740.

STONE, Samuel B. et al. A comparison of financial indicators: The case of Detroit. **Public Budgeting & Finance**, v. 35, n. 4, p. 90-111, 2015. 10.1111/pbaf.12079.

TOLLINI, Hélio Martins. Repensando a gestão das finanças públicas no Brasil. **Finanças públicas: da contabilidade criativa ao resgate da credibilidade.** Rio de Janeiro: Record, p. 115-148, 2016.

WANG, Xiaohu; DENNIS, Lynda; TU, Yuan Sen. Measuring financial condition: A study of US states. **Public Budgeting & Finance**, v. 27, n. 2, p. 1-21, 2007. 10.1111/j.1540-5850.2007.00872.x.

ZAFRA-GÓMEZ, José Luis; LOPEZ-HERNANDEZ, Antonio Manuel;

HERNÁNDEZ-BASTIDA, Agustín. Desenvolvimento de um modelo para medir a condição financeira do governo local: Avaliando a qualidade do serviço e minimizando os efeitos do ambiente socioeconômico: Uma aplicação aos municípios espanhóis. **The American Review of Public Administration**, v. 39, n. 4, p. 425-449, 2009. 10.1177/0275074008320710.

ZHANG, Zhiwei; GIBSON, Bryan; SCHAFER, Josephine Gatti. Reexaminando a relação entre estresse fiscal e terceirização. **Public Performance & Management Review**, v. 41, n. 1, p. 22-46, 2018. 10.1080/15309576.2017.1358645.