

# Framework Proposal for the Analysis of Tax Illusion, Its Antecedents, and Consequents

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## Abstract

The present research aims to propose a framework to analyze the fiscal illusion, its antecedents, and consequents from the perception of Brazilian taxpayers. In terms of methodological typology, this research was framed as descriptive, using the survey as a procedure and the approach to the quantitative problem through Structural Equation Modeling techniques. After adjusting the model, the results show a significant correlation between the constructs of fiscal illusion and open data and a significant correlation between budgetary governance and fiscal illusion and between fiscal governance and fiscal illusion. Based on the analysis involving fiscal illusion and citizen participation, we conclude that there is a significant relationship between the constructs. Furthermore, the proposed integrated model indicated the possibility of improvement in the adjustment indices by considering significant correlations between the constructs concerning open data and budgetary governance, open data and fiscal governance, and budgetary governance and fiscal governance. It is inferred that the validated framework constitutes an academic implication, addressing theoretical gaps and contributing practically and with a social purpose, making it possible to improve the functioning of public administration and the provision of efficient services.

**Keywords:** tax illusion, contributors, citizen participation, structural equation modeling

## 1. Introduction

As a result of the impacts caused by the provision of public services, contemporary society seeks to participate in political, social, and public finance discussions. However, responsibility for public finances has been a recurrent requirement of society (Tirole, 2011). In this context, public finances ensure the exercise of social interests, which is essential for the effectiveness of activities managed by the State (Blishchuk, 2021). In turn, Quayle (2021) states that accounting and accountability can respond to public interest challenges concerning social, political, and moral aspects, providing a conceptual framework to guide situations.

However, among the justifications for this scenario of creating a fiscal illusion is the combination of factors conducted by institutions to discourage taxpayers from seeking information on the financing of public expenditures (Prado & Silva, 2020). In this environment, the study highlights aspects related to the lack of disclosure of public information and non-compliance with budgetary and fiscal governance in exercising government activity.

Assuming that the tax illusion theory is based on the taxpayer's inability to internalize the total cost of public programs, meaning an incorrect perception of the amount paid with a tax or its usefulness, we concluded that the illusion is caused by the force of countless variables, namely economic, social, and political factors (Puviani, 1976; Guillamón, Bastida, & Benito, 2011; Dell'anno & Mourão, 2011).

Thus, Sausgruber and Tyran (2005) describe tax illusion as the erroneous perception of tax burden by individuals.

Corroborating this, Guziejewska (2021) refers to fiscal illusion as a misunderstanding of public finance, its mechanisms, and laws. Araújo, Mourão, and Daraujo (2020) highlight the need for studies to identify new factors that may create a fiscal illusion.

That said, this research delimits its object of study to four constructs of potential association with the fiscal illusion, divided between antecedents and consequents: open data, budgetary governance, and fiscal governance are investigated as antecedent factors, and citizen participation as a consequent.

As for the opening of data and its relationship with the fiscal illusion, Araújo and Siqueira (2016) state that the government is interested in managing the data disclosure, as these reduce the ability of taxpayers to relate the policies practiced and the information disclosed. Closs-Davies, Bartels, and Merkl-Davies (2021) point out that advertising in the public sector has grown with the advent of New Public Management.

In turn, Dell'anno and Mourão (2011) ensure that better public administration practices should be implemented to reduce fiscal illusion. Governance represents one of the best practices in the new public administration, as it stands out as a tool that enables services to be offered to society with quality and continuity (Slomski, 2005). Budget governance involves preparing, overseeing execution, and ensuring the budget aligns with public objectives (Organization for Economic Cooperation and Development – OECD, 2014). Thus, Ahrens and Ferry (2015) suggest further international research on the potential for responsibility and budget in the organizational, institutional, and social aspects of public services due to the relevance that public services have in the lives of citizens around the world, as well as due to the current challenges of financial sustainability and the pursuit of value for money.

Höglund, Mårtensson, and Thomson (2021) emphasize that the objective of public management is to satisfy the collective desires expressed through citizen participation in the political process. In this way, the interested parties provide information about who values what, contributing to improving the quality and effectiveness of public services.

Thus, citizen participation is a consequential construct of fiscal illusion. Through it, society participates in decision-making (Melloulia, Luna-Reyes, & Zhang, 2014) and can be motivated by public institutions (Buchanan, 1967). In this process, the numerous forms of disseminating fiscal illusion constitute challenges for full citizen participation (Pommerehne & Schneider, 1978). According to Clarinval, Simonofski, Vanderose, and Dumas (2021), more research is needed to improve citizen engagement in the initial stages of developing public presentations, expand citizen participation, integrate public exhibitions with other means of participation, deal with the changing urban context to enhance the experience of participation.

From the scenario described, the research question is presented: **What is the appropriate framework to analyze the fiscal illusion, its antecedents, and consequents?**

Considering the presented context and the formulated research problem, the general objective of the research is to propose a framework to analyze the fiscal illusion, its antecedents, and consequents. The theoretical framework is discussed below.

## **2.Theoretical Framework**

From the perception of Guziejewska (2016) and Dollery and Worthington (1996), the illusion is a false belief about something that does not exist or an erroneous and distorted interpretation, causing a misinterpretation of the costs and benefits of public services. Puviani (1976), Guillaumón, Bastida, and Benito (2011), and Prado and Silva (2020) expose that fiscal illusion is caused by numerous variables combined by institutions to discourage taxpayers from seeking information.

Among these factors is the lack of disclosure of public information and the non-compliance with aspects of budgetary and fiscal governance. In this sense, the fiscal illusion is motivated by economic, social, and political factors (Dell'anno & Mourão, 2011).

Concerning the hypothesis involving open data and fiscal illusion, given the possibility of taxpayers having complete information, they certainly do not support all public programs (Baekgaard, Serritzlew, & Blom-Hansen, 2016). The high cost of capturing helpful and timely information on tax aspects and public spending contributes to the propagation of fiscal illusion (Pommerehne & Schneider, 1978). Therefore, imperfect information causes illusion (Guedes & Gasparini, 2007). Thus, among the leading causes of fiscal illusion is the asymmetry of information between voters and politicians (Haug, 2009).

Dell'anno and Dollery (2014) state that governments must provide transparent reports to avoid the occurrence of fiscal illusions. Thus, the hypothesis emerges:

H1 - There is a significant influence between open data and fiscal illusion.

Regarding the hypothesis that deals with budgetary governance and fiscal illusion, according to the OECD (2014), budgetary governance consists of elaboration, supervision of execution, and guarantee of alignment of the budget with public objectives. Added to this argument is that, according to Siqueira and Nogueira (2014), fiscal illusion develops in the public budget in both revenue and expenditure.

Corroborating this, Mitias and Turnbull (2001) state that the taxpayers' lack of knowledge about the budget process causes income effects and perceived effects of distortion of the tax price, generating the flypaper effect that constitutes a source of fiscal illusion. Therefore, we should consider that taxpayers make biases in budget decisions because of underestimating the costs of public spending (Gemmell, Morrissey, & Pinar, 1999; Dell'anno & Dollery, 2014; Prado & Silva, 2020), providing an environment for the development of tax illusion. Thus, the hypothesis emerges:

H2 - There is a significant influence between budgetary governance and fiscal illusion.

According to Bracci, Humphrey, Moll, and Steccolini (2015), the austerity era has created challenges for public services, with demands for cuts in expenses, delivery of balanced budgets, and the need for strategies to reduce the deficit, emerging need for governance mechanisms.

Thus, the hypothesis involving fiscal governance and fiscal illusion is guided in the literature by Dell'anno and Mourão (2011) when they state that fiscal illusion is a phenomenon motivated by economic, social, and political factors that are capable of causing an increase in public debt, the deterioration of long-term public balances, the preference for indirect taxation and fiscal fragmentation, as well as budget deterioration, all of which are objects of study in fiscal governance.

Among other ways of causing fiscal illusion within fiscal governance are the tax burden divided throughout the year and various collection instruments (Pommerehne & Schneider, 1978). These elements that characterize complexity in tax systems are used to deceive taxpayers (Buchanan, 1967). Thus, the hypothesis emerges:

H3 - There is a significant influence between fiscal governance and fiscal illusion.

From the perspective that involves fiscal illusion and citizen participation, according to Melloulia, Luna-Reyes, and Zhang (2014), citizen participation is a new form of democracy in which the population is part of the decision-making process. It occurs through citizens' extensive use of technology to interact with governments to contribute to the design and implementation of public policies and decisions transparently and responsibly.

Therefore, the motivation for citizen participation to occur is generated, in part, by public institutions that can predict taxpayer behavior based on information disclosures (Buchanan, 1967).

Thus, society participates little in this process, as fiscal illusions influence it. This way, citizens remain uninformed and consequently do not participate in the process of tax choices, according to Buchanan and Wagner (1977), due to the lack of transparency in the tax structure, among other factors. Thus, the hypothesis emerges:

H4 - There is a significant influence between fiscal illusion and citizen participation.

The methodological procedures are discussed below.

### 3. Methodological Procedures

The research was delimited into three categories regarding the objectives, procedures, and approach to the problem. This design becomes necessary to search for answers to the proposed research problem. Therefore, the research is classified as a descriptive survey with a quantitative approach (Raupp & Beuren, 2006).

The studied population comprises taxable persons. Therefore, this research considers natural persons subject to tax payment (Rezende, Pereira, & Alencar, 2010).

To determine the minimum sample size, we followed Hair Jr. et al. (2014) rule of at least ten respondents for each observable variable. Thus, with these parameters, the sample comprises at least 460 cases (46 observable variables multiplied by ten respondents). After data collection, 765 responses were obtained. However, due to data cleaning, the final survey sample consisted of 618 individuals, meeting the established criteria and considering a quantity above 13 respondents per variable.

Table 1. Research instrument

Var.	Description
FI1	I believe that taxpayers' behavior in controlling tax collection would change if consumption taxes (purchases of products, services) were collected separately
FI2	I believe I pay more consumption tax (indirect) than income tax (direct tax)
FI3	I believe that what I pay in taxes is equal to what I receive from the State
FI4	I know the tax rate charged on a coffee in a restaurant
FI5	I have seen an invoice that shows the amount of taxes paid when purchasing a product or providing a service
FI6	I know how much I pay in taxes monthly
FI7	I know the tax rate on a soft drink in a restaurant
FI8	I consider the time taken to calculate and pay taxes to be very long
FI9	I consider Brazil very fiscally stable, as there are few changes in the rules of the tax system
FI10	Fiscal transparency is the most critical measure to improve the Brazilian tax system
FI11	I consider the tax burden high in Brazil
FI12	If there is a budget surplus, priority should be given to reducing the tax burden before reducing the public debt
CP1	Popular participation in the decision-making process and construction of public policies is relevant
CP2	The society participates in public debates
CP3	There is an interaction between society and the government through technology
CP4	It is crucial for governments to integrate the population's point of view into decisions
CP5	The government must provide helpful, relevant, and complete information for citizen participation
CP6	Society explores/analyzes data made available by governments
OD1	All public data are available
OD2	The data are disseminated in the same way gathered at the source
OD3	The data are made available according to the required speed
OD4	Data are available to the broadest possible audience and for many different purposes
OD5	The data are reasonably structured to allow for automated processing
OD6	Data are available to everyone; no identification or registration is required
OD7	Data are available in a format that no single entity will have exclusive control over
OD8	The data are subject to regulations or copyrights, trademarks, or trade secrets
BG1	Budgets are managed within clear, credible, and predictable boundaries for fiscal policy
BG2	Budgets are aligned with the government's medium-term strategic priorities
BG3	The capital budget is designed to meet national development needs economically and coherently
BG4	Budget documents and data are open, transparent, and accessible
BG5	An inclusive, participatory, and realistic debate on budget options is provided
BG6	Comprehensive, accurate, and reliable accounting of public finances is presented
BG7	Budget execution is actively planned, managed, and monitored
BG8	Performance, evaluation, and cost-effectiveness are integral parts of the budgeting process
BG9	Long-term sustainability and other fiscal risks are identified, assessed, and prudently managed
BG10	The integrity and quality of budget forecasts, fiscal plans, and budget implementation are promoted through rigorous process quality assurance, including independent external auditing
FG1	Transparency in public institutions and the performance of public agents must prevail, making knowledge of their acts available, accessible, and understandable to citizens, as well as demanding accountability
FG2	Respect for established legal rules confers stability and security
FG3	There is a collaboration between the public and private sectors, as well as the establishment of dialogue channels between public, social, and economic agents
FG4	Governments can evaluate, direct, and monitor the management of public policies and services, aiming to satisfy the needs of citizens in an equitable, inclusive, and effective manner within an adequate time and with efficient and effective use of public resources
FG5	The mechanisms of democratic and transparent management of public finances can seek to meet the needs of citizens, making human rights effective and rationalizing the use of public resources
FG6	There is a budget balance in the national public accounts, which involves fiscal measures to contain expenditures and increase revenues to ensure that sufficient revenues finance public expenditures
FG7	There is long-term public debt sustainability, i.e., the ability to pay in the medium- and long-term
FG8	The mechanisms for expanding the collection base, without implying an increase in the individual tax burden, are noticeable and efficient
FG9	There is quality control in spending through appropriate choices and efficiency in the use of resources
FG10	Budget appropriations are managed per the principles of economy, efficiency, and effectiveness, resulting in sound financial management

Source: Prepared by the author (2023).

Based on the research questions and the proposed objectives, the research was conducted using a research instrument, with data being collected through a closed questionnaire produced in Google Forms.

The snowball method was used for collection, consisting of a sampling technique using reference networks. Therefore, it is suitable for studies with groups that are difficult to research when the research universe is not known or even when it comes to delicate topics and requires knowledge of people who already belong to the group (Bockorni & Gomes, 2021). The collection period was from July 1 to October 1, 2022, totaling 93 days. As for ethical precepts, the present work was approved by the Research Ethics Committee (CEP).

To carry out the study, a data collection instrument was developed, consisting of five blocks, to measure the following latent variables, namely: i) fiscal illusion (Araújo, Mourão, & Daraujo, 2020); ii) citizen participation (Melloulia, Luna-Reyes, & Zhang, 2014); iii) open data (Vieira & Álvaro, 2018); iv) budget governance (OECD, 2014); and v) fiscal governance (Catarino, 2015; Abraham, 2019).

The observable variables are operationalized through the answers to the questionnaire and presented affirmatively, within a degree of agreement or disagreement, based on the 5-point Likert scale: i) 1 = Totally disagree; ii) 2 = Partially Disagree; iii) 3 = Neither disagree nor agree; iv) 4 = Partially agree; and v) 5 = Strongly Agree.

At the end of the questionnaire, the respondents provide additional data, which helps characterize the sample. Notably, the data collection instrument was validated by three experts, chosen using the criterion of performance in the research area.

Descriptive statistics was performed to understand the procedures and techniques for collecting, sorting, summarizing, and portraying data (Santos, 2007).

The structural equation modeling technique explores the relationships between constructs based on theoretical indications (Guimarães, Severo, & Vasconcelos, 2017). At the same time, discriminant and convergent validity are analyzed to observe the variables' consistency. The following topic highlights the results and discussions.

#### 4. Results and Discussions

As for the respondents' profile, we found that the survey sample is primarily men (55.30%) and that women represent 44.70% of the surveyed public. Concerning the age group, 29.40% are between 51 and 60. Additionally, 13.80% of the sample is over 61 years old. Another 26.90% are between 41 and 50 years old, 23.30% are between 31 and 40, and only 6.60% are between 18 and 30.

In this research, carried out with respondents from the 5 Brazilian regions (North, Northeast, South, Southeast, and Central-West), the Southeast was the most recurrent region of residence, as indicated by 31.70% of the respondents, followed by the South region, indicated by 20.90% of the sample, the Northeast, represented 17.80%, the Central-West, 17.20%, and the North mentioned by 12.50% of respondents.

Subsequently, composite reliability and average variance extracted tests were performed, consisting of indicators that aim to assess the quality of the structural model of an instrument. According to Bagozzi and Yi (1988), we expected that the result would be  $\geq 0.6$  for the composite reliability since the calculation of the average variance extracted is expected to be  $\geq 0.5$ , according to Fornell and Larcker (1981).

By observing the result of the composite reliability test (0.977) that involves all the observable variables, we verified that there is internal consistency of the construct indicators well above the parameter defined by the literature ( $\geq 0.6$ ).

Concerning the average variance extracted that aims to explain the total variance of each variable, it is inferred from the result of the constructs analyzed together that the finding (0.614) is higher than the value defined in the literature ( $\geq 0.5$ ).

As for the analysis of the composite reliability of each construct, it is possible to show that all presented an adequate result according to the value ( $\geq 0.6$ ) determined by Bagozzi and Yi (1988), namely: i) budgetary governance (0.953); ii) open data (0.873); iii) financial governance (0.873); iv) fiscal illusion (0.899) and v) citizen participation (0.747). Thus, it is inferred that the observable variables are consistent in their measurements.

The results that comprise Convergent Validity and Discriminant Validity make it possible to infer that there is evidence of convergent validity since correlation indices greater than 0.509 are detected and, therefore, accepted as an indication that such instruments measure the same factor, according to the teachings of Nunes and Primi (2010).

According to Santos and Fernandes (2006), the discriminant validity is positive when the dimensions present extracted variances greater than the shared variances. Through Table 2, it is possible to observe the predominance of this premise.

Table 2. Convergent and discriminant validity

	BG	OD	FG	FI	CP
BG	<b>0.70<sup>a</sup></b>				
OD	0.59 <sup>b</sup>	<b>0.54<sup>a</sup></b>			
FG	0.15 <sup>b</sup>	0.13 <sup>b</sup>	<b>0.55<sup>a</sup></b>		
FI	0.84 <sup>b</sup>	0.49 <sup>b</sup>	0.10 <sup>b</sup>	<b>0.75<sup>a</sup></b>	
CP	0.44 <sup>b</sup>	0.43 <sup>b</sup>	0.17 <sup>b</sup>	0.40 <sup>b</sup>	<b>0.50<sup>a</sup></b>

<sup>a</sup> Average Variance Extracted.

<sup>b</sup> Shared Variance.

Source: Survey data (2023).

The analyses of the results on convergent and discriminant validity are discussed below. The budgetary governance construct had a convergent validity of 0.70, above the value Nunes and Primi (2010) recommended, which is  $\geq 0.509$ . Only the shared variance involving budgetary governance with the fiscal illusion factor was above the reference parameter (0.84), indicating the need for other variables to complement the construct.

By analyzing the open data construct (0.54), we observed that it reached convergent validity, as recommended by Nunes and Primi (2010), who expected values  $\geq 0.509$ . Through the correlations, it can be inferred that the findings are lower than those of the convergent validity. Only the relationship with the budgetary governance construct (0.59) is greater than the value identified in the convergent validity, indicating the need for other variables to complement the construct.

The analysis of the fiscal governance construct (0.55) demonstrates that the convergent validity meets what is recommended by Nunes and Primi (2010) ( $\geq 0.509$ ). Based on the correlations, we can see that the convergent validity result is greater than the discriminant validity values, which demonstrates that the observable variables of the fiscal governance factor can explain its construction.

The fiscal illusion (0.75) has convergent validity above that recommended by Nunes and Primi (2010), which consists of  $\geq 0.509$ . For analysis purposes regarding discriminant validity, the value of the correlation involving budgetary governance (0.84) is highlighted.

As for citizen participation (0.50), the convergent validity is close to the value recommended by Nunes and Primi (2010), that is,  $\geq 0.509$ . The correlations with the variables studied showed shared variance values lower than the convergent validity of the citizen participation construct. Thus, it is inferred that the observable variables of the citizen participation construct can explain its development. Next, there is an assessment of the validity of the measurement model.

After analyzing the initial model, the need to adjust it was identified. Thus, a proposed model best represented the influences involving the fiscal illusion, its antecedents, and consequents. This technique makes it possible to identify the best way to analyze the data based on model adjustments.

Modifications to the initial model occurred cumulatively, being assessed according to the correlations between the constructs: open data and fiscal governance, budgetary governance and fiscal governance, budgetary governance and open data, budgetary governance and fiscal illusion, fiscal illusion and fiscal governance, open data and fiscal illusion and, finally, the relationship between fiscal illusion and citizen participation.

Additionally, correlations between observable variables were tested using Pearson's Correlation Matrix, as follows: BG1←BG; BG2←BG; BG3←BG; BG4←BG; BG5←BG; BG6←BG; BG7←BG; BG9←BG; BG10←BG; OD6←AD; OD5←AD; OD4←AD; OD3←AD; AD2←AD; AD1←AD; FI4←FI; FI6←FI; FI7←FI; CP2←CP; CP3←CP; CP6←CP; FG4←FG; FG5←FG; FG6←FG; FG7←FG; FG9←FG; FG10←FG.

To assess the final model, the structure of factors from the initial model was used: budget governance, open data, fiscal governance, fiscal illusion, and citizen participation. Thus, the correlations suggested in the adjustment of the model and the correlations identified through the Pearson correlation matrix gave rise to the experiment of creating the proposed integrated model, as shown in Figure 1.

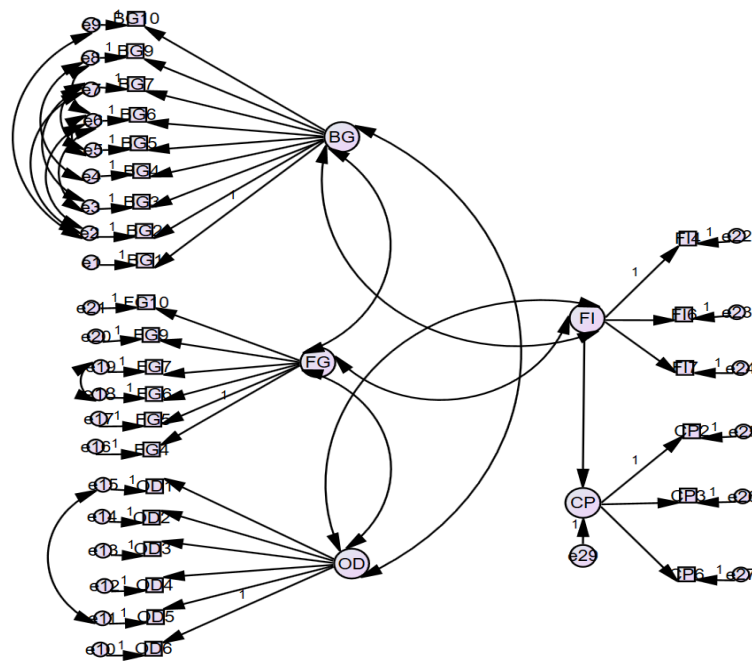


Figure 1. Proposed integrated model

Source: Survey data (2023).

The findings of the proposed integrated model made it possible to compare the adjustment and quality indices between the initial and proposed models, according to Table 3.

Table 3. Adjustment indices

Index	Theoretic model	Suggested model
Chi-square	1367.163	576.295
Degrees of freedom	320	306
Chi-square divided by degrees of freedom	4.272	1.883
Significance Level	0.000	0.000
GFI – Goodness of Fit Index	0.859	0.937
AGFI – Adjusted Goodness of Fit	0.834	0.922
CFI – Comparative Fit Index	0.856	0.963
NFI – Normed Fit Index	0.821	0.924
RMSEA – Root Mean Squared Error of Approximation	0.079	0.038
RMR – Root Mean Square Residual	0.220	0.087
ECVI – Expected Cross-Validation Index	2.404	1.167
Cronbach's alpha	0.907	
KMO – Kaiser-Meyer-Olkin	0.933	
Average Variance Extracted (AVE)	0.614	
Composite Reliability (CR)	0.977	

\*Significance level  $p < 0.001$ .

Source: Survey data (2023).

The absolute fit measure of Chi-square ( $\chi^2/\text{degrees of freedom}$ ) showed an adequate result of 4.272 in the theoretical model, being  $\leq 5$ , whereas in the proposed integrated model, this measure is 1.883, so the estimated covariance matrix was close to the actual model checked.

As for the Goodness of Fit Index (GFI), which presented 0.859, it now indicates a perfect fit of 0.937, that is, greater than 0.9.

Regarding the parsimony adjustment, the adjusted Goodness of Fit Index (AGFI) initially presented a result of

0.834, and in the proposed model, it reached 0.922, showing an improvement in the index and adequacy to the parameter defined by Hair Jr. et al. (2014).

The Comparative Fit Index (CFI) presented an initial result of 0.856. Before the adjustment, it is inferred that the indicator reached 0.963, thus meeting the values recommended by Ladeira Junior, Souza, and Berte (2012).

The Normed Fit Index (NFI), an incremental adjustment index, showed an initial value of 0.821. After adjustments, the proposed integrated model obtained a value of 0.924.

The Root Mean Squared Error of Approximation (RMSEA) improved from 0.079 to 0.038. Considering that the maximum limit is 0.08, we concluded that a result within the measures established by Hair Jr. et al. was obtained (2014).

When comparing the initial model and the one proposed through the Root Mean Square Residual (RMR), we observed that the result of the initial model presented 0.220, and the proposed model presented 0.087. Based on the premise that the smaller the result, the better the model adjustment, it is possible to infer that the proposed model presents better adequacy.

The Expected Cross-Validation Index (ECVI) makes it possible to obtain the best quality for two samples of the same size. From the findings, it is inferred that there was a decrease between the initial value (2.404) and that of the proposed model (1.167).

Thus, through the tested fit and quality indices (GFI, NFI, CFI, AGFI, RMSEA, RMR, and ECVI), based on the validity and reliability indicators of the variables (Cronbach's alpha, KMO, Bartlett's sphericity, average variance extracted, composite reliability, and convergent and discriminant validity) it is inferred that the relations and correlations presented in the proposed integrated model are adequate.

The hypothesis test of the proposed integrated model (Table 03) presents a significant p-value ( $p \leq 0.05$ ) for all analyzed constructions, highlighting the standardized estimates involving budgetary governance and the observable variable BG4 (0.817), fiscal illusion, and variable FI7 (0.851).

Based on the results found in Table 04, we can see the assumptions between the following constructs: open data and fiscal governance (OD $\leftrightarrow$ FG), budgetary governance and fiscal governance (BG $\leftrightarrow$ FG), budgetary governance and open data (BG $\leftrightarrow$ OD), budgetary governance and fiscal illusion (BG $\leftrightarrow$ FI), fiscal illusion and fiscal governance (FI $\leftrightarrow$ FG), open data and fiscal illusion (OD $\leftrightarrow$ FI), and a relationship between fiscal illusion and citizen participation (FI $\rightarrow$ CP).

Table 4. Tests of the proposed integrated model

Constructs	Estimates	p-value
OD $\leftrightarrow$ FG	0.483	0.000*
BG $\leftrightarrow$ FG	0.835	0.000*
BG $\leftrightarrow$ OD	0.582	0.000*
BG $\leftrightarrow$ FI	0.151	0.000*
FI $\leftrightarrow$ FG	0.104	0.026*
OD $\leftrightarrow$ FI	0.132	0.006*
FI $\rightarrow$ CP	0.181	0.000*

\*Significance level  $p \leq 0.05$ .

Source: Survey data (2023).

The parameter in which the p-value needs to be less than 0.05 was used to confirm the assumptions, and it was possible to confirm the assumptions established in the proposed integrated model according to Table 4.

A significant correlation exists between the hypotheses (H1), open data, and fiscal illusion (OD $\leftrightarrow$ FI), with an estimate of 0.132 and a p-value of 0.006. In this sense, the tax illusion deceives taxpayers to pay more than they agreed (ODVIDSON, 2018). Thus, public managers are not motivated to make decisions that could jeopardize the structure of government revenues. In this way, managers avoid encouraging good transparency practices in the public sector. Therefore, it makes users of government financial information rationally ignorant, making them suffer from fiscal illusion (Chan & Rubin, 1987).

This research finding shows that the open data construct's behavior influences the fiscal illusion's behavior and vice versa. Therefore, future research should not dissociate them.



Such findings corroborate the State's attempt to discourage taxpayers from seeking information using combinations of constructs, as Prado and Silva (2020) explained. Corroborating this, Teixeira (2018) states that the lack of knowledge about how much taxpayers receive and pay to the State causes fiscal illusion. Furthermore, the fiscal illusion theory is based on the taxpayer's inability to internalize the cost of public programs (Puviani, 1976; Guillamón, Bastida, & Benito, 2011). In the same way, it consolidates Araújo's understanding (2014) regarding the presence of illusion distorting the perception of reality due to the taxpayers' limited understanding.

In the second hypothesis (H2) involving budgetary governance and fiscal illusion (BG $\leftrightarrow$ FI), we obtained an estimate of 0.151 and a p-value of 0.000.

This research demonstrates the association between budgetary governance and fiscal illusion. Instead of a relationship as proposed in the literature, the proposed integrated model exposes the existence of a significant correlation between the constructs, which means that the behavior of budgetary governance influences the behavior of fiscal illusion and vice versa.

With the implementation of good public administration practices, including budgetary governance mechanisms, taxpayers can become permanent vigilantes of the budgetary process, preventing the occurrence of fiscal illusion (Dell'anno & Mourão, 2011). In the new public administration, governance stands out as a good practice that enables services to be offered to society with quality and continuity (Slomski, 2005).

Citizen participation in budget process decisions helps reduce the fiscal illusion (Dell'anno & Mourão, 2011). Corroborating this, Mitias and Turnbull (2001) state that the taxpayers' lack of knowledge about the budgetary process causes effects that constitute sources of fiscal illusion.

On the other hand, the public budget is a favorable space for developing fiscal illusion, influencing the size and quality of expenditures (Siqueira & Nogueira, 2014). Furthermore, biases in budget decisions are made by taxpayers because of underestimating the costs of public spending (Gemmell, Morrissey, & Pinar, 1999; Dell'anno & Dollery, 2014; Prado & Silva, 2020).

Thus, establishing that the origin of prejudices about recurring and predictable budget decisions is caused by fiscal illusion (OATES, 1988; Afonso, 2014), Norcross and Smith (2021) believe that due to the presence of stakeholders and the ability of policymakers, the fiscal illusion is linked to governance problems.

These principles that guide budget governance should provide the confidence in the budget system taxpayers need concerning the State's application of resources efficiently, effectively, and sustainably (Bijos, 2014), as well as enabling a significant social transformation (Abraham, 2019).

In the third hypothesis (H3), fiscal governance and fiscal illusion (FG $\leftrightarrow$ FI), the results showed an estimated 0.104 and a p-value equivalent to 0.026. Thus, in addition to identifying a correlation between the constructs, the present research innovates in detecting their significance. Therefore, changing the behavior of the variables of the fiscal governance construct influences the behavior of the variables of the fiscal illusion construct and vice versa.

It should be noted that among the most common forms of causing tax illusion are the elements that characterize the complexity of tax systems, such as, for example, low dependence on general taxes and the occurrence of fragmentation of the tax burden (Buchanan, 1967). Thus, the more complex the system, the greater the degree of underestimation of the taxpayer (Pommerehne & Schneider, 1978; Dell'anno & Mourão, 2011).

As well as confirming what was exposed by Buchanan (1967) when reporting that the level of information an individual has varies according to the taxes they pay, tax awareness should be more significant under direct taxes than indirect taxes.

Tax systems with a preponderance of collection through indirect taxes tend to generate a more incredible fiscal illusion (Sausgruber & Tyran, 2005; Silva & Siqueira, 2013; Milhomem, 2016). Thus, this result converges in the sense of demonstrating that aspects of fiscal governance impact the fiscal illusion as guided by Dell'anno and Mourão (2011), Dell'anno and Dollery (2014), Jeong (2018), Guedes and Gasparini (2007), Oates (1988), Buchanan (1967), Milman (2016), and Maddah and Jeyhoon-Tabar (2018).

While the fourth hypothesis (H4) is between fiscal illusion and citizen participation (FI $\rightarrow$ CP), it is inferred that there is a significant relationship, with an estimate of 0.181 and a p-value of 0.000.

Thus, it is possible to state that a change in the behavior of the fiscal illusion construct influences the behavior of the citizen participation construct. Thus, we conclude that fiscal illusion influences citizen participation in public decision-making in the context of Brazilian taxpayers.

We found that fiscal illusion is generated by several variables and is based on the citizen's failure to internalize

the cost of public goods and services, corroborating the findings of Puviani (1976), Guillamón, Bastida, and Benito (2011) and Teixeira (2018).

It is inferred that, based on the findings, the participation of taxpayers in public debates, their interaction with the government through technology, and the analysis of public data are influenced by fiscal illusion by the level of knowledge that taxpayers have concerning the tax burden they pay.

We should mention that the motivation for citizen participation is generated by public institutions based on published information (Buchanan, 1967). In this way, citizen participation requires taxpayer engagement, which depends on citizens' willingness to believe their participation in public debates will positively impact their lives. Governments must provide possibilities for popular participation and formulate decisions integrating taxpayers' perceptions (Melloulia, Luna-Reyes, & Zhang, 2014). Due to citizen participation, it is characterized by using technology to interact with the State and to contribute to public decisions (Melloulia, Luna-Reyes, & Zhang, 2014).

When citizens cannot interpret public services' actual costs and benefits, fiscal illusion emerges due to their limited understanding (Dollery & Worthington, 1996; Araújo, 2014).

Furthermore, we found that the correlation between open data (OD) and fiscal governance (FG) is significant (p-value 0.000) and positive (standardized estimate of 0.483).

In this way, it appears that, to the extent that open data are developed in public management, the fiscal governance mechanism also works in a coordinated and correlated manner. By observing the initial model compared to the proposed one, this correlation (open data and fiscal governance) works as an inducer for the fiscal illusion to occur markedly.

In this sense, fiscal governance comprises rules, regulations, and procedures that influence fiscal policy (Bijos, 2014; Kaplanoglou & Rapanos, 2011). Likewise, in the Brazilian context, open data is represented by the information disclosed due to legal or regulatory requirements.

Likewise, the correlation between budgetary and fiscal governance (standardized estimate of 0.835) is also significant (p-value of 0.000), not predicted in the literature. Some elements of the constructs' variables contributed to this correlation's constitution. Among them are the need for budget allocations to be managed following the pillars of sound public finance management, the need to control the quality of expenses and allocation of resources, and the search for a budgetary balance of public accounts. In this scope, there is a need for integrity and quality of budget forecasts and fiscal plans.

Given the results, it is possible to conclude that the variables that make up the budgetary governance construct can influence the behavior of the variables of the fiscal governance construct, as well as the change in the behavior of the variables that make up fiscal governance that influences budgetary governance.

Therefore, fiscal governance is intertwined with budgetary governance to the extent that fiscal governance seeks financial sustainability based on budgetary balance (Abraham, 2019). Furthermore, fiscal governance connects with budgetary governance, an efficient instrument that aims to ensure budget execution according to planned goals, as Abraham advocates (2019).

Through the findings in this research, it is possible to assess the manner and effects of implementing governance in fiscal and budgetary processes, meeting the gap exposed by Armstrong (2013).

The following discussion corresponds to the significant correlation between open data (OD) and budgetary governance (BG) (standardized estimate of 0.582 and significant p-value of 0.000).

Given the findings, it is possible to infer a correlation between the open data and budget governance constructs, considering that opening data to the most considerable number of people makes budget information open, transparent, and accessible and provides an inclusive and participatory debate. Likewise, when budgetary data becomes open, transparent, and accessible, it is available to society, which is precisely the nature of the open data construct.

As warned by Abraham (2019), although the public budget is a crucial element in meeting the needs of society, participation and social control must occur for its execution.

It remains evident that for participation and social control to occur, taxpayers must have access to public data to monitor the implementation of budgetary governance, justifying the correlation found in the study. On the other way of this connection, the feedback of this correlation can be highlighted because, while the existence of open data will facilitate the monitoring of budgetary governance, this, in turn, will enable the identification of planning deviations that will indicate the need to disclose new data. Next, we present the final remarks.

## 5. Final Remarks

This study contributes to the proposition of a framework capable of analyzing the influence of fiscal illusion, its antecedents, and consequents from the perception of Brazilian taxpayers.

Pondering the proposed integrated model and data from the adjustment indices concerning the general objective that proposed a framework to analyze fiscal illusion, its antecedents, and consequents from the perception of Brazilian taxpayers, we found that the constructs of open data, budgetary governance, and fiscal governance are antecedents that influence and are influenced by fiscal illusion. Furthermore, it is inferred that fiscal illusion influences citizen participation.

The proposed integrated model innovated in science, indicating the improvement in the adjustment indices from considering significant correlations between the following constructs: open data and budgetary governance, open data and fiscal governance, and budgetary governance and fiscal governance.

It is inferred that the findings meet the expectations of Sausgruber and Tyran (2005) in the sense of contributing to the field of the causes and consequences of fiscal illusion in more complex environments. Likewise, it corroborates Dell'anno and Mourão (2011) in the perspective that fiscal illusion is motivated by economic, social, and political factors, among others. By showing that the antecedents influence the behavior of fiscal illusion, which, in turn, influences the consequent, through the study of numerous variables, the study meets the research agenda of Puviani (1976), Guillaumón, Bastida, and Benito (2011), Araújo (2014), and Teixeira (2018). In addition, the present research contemplates the suggestions of Buehn, Dell'anno, and Schneider (2018), the gap pointed out by Araújo, Mourão, and Daraujo (2020), as well as with notes by Dziemianowicz *et al.* (2017) and suggestions for future research by Silva and Siqueira (2013).

Because of the results, the proposal, which identified an adequate framework to analyze fiscal illusion, its antecedents, and consequents, was accepted.

In the theoretical dimension, constructing and validating the proposition of a framework for analyzing the influence that involves the fiscal illusion, its antecedents and consequents stand out. In the academic field, it is worth highlighting the review and structuring of the literature around the investigated theme.

Through research, public administrators can evaluate their respective managements regarding the influence on the behavior of taxpayers based on the studied constructs. Likewise, it is possible to identify the sectors that need intervention through monitoring and planning, aiming to make adjustments to improve results.

In the social dimension, citizen participation represents a relevant tool for complete social control, especially over public expenditure.

This research is limited because it did not use antecedent constructs intrinsically related to the citizen. Thus, future studies may include new constructs, including mediators of these connections, or consider the perception of contributors from other countries.

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