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Tax Compliance Actions by Tax Authorities and Voluntary Compliance with Tax Obligations by Individual Taxpayers

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Abstract

Research objective: Tax compliance actions aim to improve the relationship between the tax authorities and taxpayers, increasing voluntary compliance with tax obligations and reducing administrative and judicial litigation. In this sense, the defined objective was to analyze whether tax compliance actions increase voluntary compliance with tax obligations.
Methodology: Thus, a quantitative approach was used, through analysis of latent classes, carried out on the baseed on longitudinal data from the Federal Revenue, with 531 individual taxpayers, related to compliance action.
Results: After the action, it was found that the taxes owed had a statistically significant increase and the tax gap was increasingly reduced between 2015 and 2018, indicating that the implemented tax compliance actions were effective in promoting voluntary compliance with tax obligations by taxpayers. In addition, the action also presented advantages to taxpayers, since, when there is a spontaneous regularization, there is less possibility of facing a tax procedure, as well as a reduction in administrative costs and the amount of litigation.
Practical and theoretical contributions: The practical contributions are aimed at enhancing future tax compliance initiatives carried out by Federated Entities. Furthermore, the theoretical contribution utilizes the Slippery Slope Model, which illustrates an upsurge in voluntary compliance with tax obligations following a compliance action, attributed to heightened authority and confidence in the tax regulatory body. As a result, this theoretical contribution underscores the significance of the Slippery Slope Model in comprehending taxpayer behavior and in devising more efficient tax compliance strategies.

Keywords: Taxpayer Behavior; Slippery Slope Model; Cooperative Compliance; Tax Compliance; Tax Obligations.

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Introduction

In exercising its sovereignty, the State needs financial resources. Despite being able to act directly in the economy, the most commonly used method by capitalist countries to meet this need is through taxation (Machado, 2010). Moreover, according to Solichin and Astuti (2021), tax is considered the most reliable financial source in the composition of the state budget.

In Brazil, tax collection is carried out in the midst of a complex National Tax System, with around 80 taxes and more than three hundred thousand tax laws, in addition to millions of infralegal acts issued by federated entities (Amaral et al., 2016). Part of this complexity is due to factors such as the multiplicity of taxes resulting from the fragmentation of the federation, as each entity (Federal, State, District, Municipal) has its own taxes; the existence of several exceptions, such as Simples Nacional and the Individual Microbusiness Owner (MEI); and the exemptions granted to specific sectors and products. All these factors contribute to an increase in administrative and judicial litigation, leading to delays in the conclusion of the tax credit cycle and, consequently, a reduction in tax collection by the Tax Administration (TA) (Viol, 2015).

This whole context causes difficulties in economic, administrative, and legal areas, both for the Tax Authorities and for the taxpayers, which is likely to cause conflict between them, considering that, from a legal point of view, they have different objectives: the Tax Authorities seek to collect revenue, while the taxpayer seeks the maximization of profit and the enjoyment of patrimonial freedom. This conflict has a clear demarcation both in the legitimacy of profit and in the exercise of individual patrimonial freedom, as well as in the limitation on the power to tax imposed mainly by CF/88 and the National Tax Code (NTC) (Almeida, 2017).

The form of compliance with the tax obligation is divided by the Tax Administration into a voluntary manner (voluntary compliance) or through coercion carried out by the Tax Authorities (enforced compliance). This distinction is quite relevant, since in enforced compliance there is a significant cost for both stakeholders (OECD, 2010). Moreover, in this context, it is relevant to highlight that the tax compliance actions, the focus of this research, are voluntary in nature, and have cooperative compliance programs as guidelines. Cooperative compliance aims to increase the level of transparency between the Tax Administration and the taxpayer, as well as improve compliance with the tax obligation, reducing costs for the parties and reducing administrative and judicial litigation (Cremades et al., 2015; Russo, 2019).

In this context, it is worth noting that initiatives by the Tax Authorities have been the focus of several countries that have a similar scenario to that of Brazil, such as Australia, Canada, Spain, United States, Netherlands, Ireland, England, and Japan. These countries already implement tax compliance actions of a cooperative nature, with the aim of improving the relationship between the Tax Administration and taxpayers, increasing voluntary compliance with the tax obligation and reducing administrative and judicial litigation (OECD, 2013), but their experiences, cannot necessarily be applied to Brazil owed to social, cultural and legal differences (Kirchler, 2007). This denotes the need for studies on this subject, specifically in the Brazilian context.

For the effective implementation of a cooperative compliance program, it is essential for tax agencies to know the behavior of taxpayers and to analyze the behavior of these taxpayers. The Slippery Slope model - which assumes that compliance with the tax obligation can be achieved with an increase in the levels of power and confidence in the tax administration - has been used by some authors to achieve this. This model was applied, focusing on tax compliance, initially by Muehlbacher et al. (2011) in a study with contributors from Austria, the United Kingdom and the Czech Republic; by Lemoine and Roland-Lévy (2012) in a study with contributors from France; by Budak (2012) in a study with contributors from Turkey; by Lozza et al. (2013) in studies with contributors from Italy; and Gangl et al. (2013), in a study with contributors from the Netherlands.

To complement the previously mentioned articles, a search was carried out on published works on October 26, 2021, in the EBSCOhost database, using the keywords "taxpayer behavior" AND "cooperative compliance" OR "behavior of taxpayer" AND "cooperative compliance" (no period restriction) and nine articles were retrieved of which only four dealt with the subject. In the Capes database, fourteen articles were retrieved and only three dealt with the subject. Thus, it appears that, despite the relevance of the theme, there are few studies on taxpayer behavior about cooperative compliance actions in Brazil, which makes it difficult on the part of tax administrations to implement more efficient compliance actions aligned with the profile of each contributor.

Therefore, given the gap evidenced and the relevance of the theme, the present study raises the following research question: Can tax compliance actions increase voluntary compliance with tax obligations? The general objective of this research is to verify whether tax compliance actions by the tax authorities increase voluntary compliance with tax obligations by individual taxpayers. Thus, a quantitative approach was used, through analysis of latent classes, carried out on the basis of longitudinal data from the Federal Revenue, with 531 individual taxpayers, related to a compliance action.

As the main findings, it is highlighted that the taxes owed had a statistically significant increase and the tax gap was increasingly reduced between 2015 and 2018, indica-

ting that the implemented tax compliance actions were effective in promoting voluntary compliance with tax obligations by taxpayers. Moreover, the action also presented advantages to taxpayers, as spontaneous regularization resulted in a lower likelihood of facing a tax procedure, along with reductions in administrative costs and litigation.

The present research proves to be currently relevant, as it is an emerging topic that, at the same time, is beginning to be a reality for the main tax authorities in Brazil. In addition, this work also has practical relevance, as it can serve as a guideline for future tax compliance actions implemented by the Federal, as well as having academic relevance, as it aims to contribute to the formation of a theory of taxpayer behavior.

2 Theoretical Reference

2.1 Contributor Behavior

The reason why people comply or not with tax obligations is one of the issues most faced by the tax authorities. Knowing taxpayer behavior is an essential task for the tax authorities to implement effective cooperative compliance programs. Additionally, in this context, in the academic literature there are some theories that help to explain the behavior of the taxpayer. Among these, the Slippery Slope model stands out (Gangl et al., 2015).

The researchers Kirchler et al. (2008) proposed the Slippery Slope model, which starts from the concept that the tax climate in society can vary from an antagonistic climate, in which the relationship of taxpayers and tax authorities is one against the other, and a synergistic climate, where both can work together. The model assumes that compliance with the tax obligation can be achieved by increasing the levels of power (in an imposed way) and trust (in a voluntary way), with these dimensions being dependent.

Thus, the idea regarding compliance with the tax obligation is presented from the perspective of the power of the tax authority and trust in the tax authority, in which economic deterrent factors are associated with psychological factors (Gangl et al., 2015).

The power of the tax authority is linked to taxpayers' perception of the capacity of tax officials to detect illegalities. In general, it has a direct relationship with the budget that the government allocates to the Tax Authorities and with the tax legislation. Regarding trust in the tax authority, it is understood as a general idea of society, individually or collectively, that tax authorities are benevolent and act in pursuit of the common good (Kirchler et al., 2008). This power is divided into coercive and legitimate. In the first, the taxpayer is coerced against their will, with the predominance of audits and fines. In the second, there is an accepted authority which is related to the perception of a transparent and fair tax system (Bradford et al., 2014; Kirchler & Wahl, 2010; Turner, 2005; Tyler, 2006). As for trust, it can be divided into two criteria: based on reason and implicit. The first part is from the objective criteria of the individual in which the tax authority can be trusted. In the second, taxpayer trust occurs unconsciously and naturally (Castelfranchi & Falcone, 2010; Gangl et al., 2019).

With this logic, we have a three-dimensional figure with the following dimensions: power of the tax authority; trust in the tax authority; compliance with the tax obligation. Thus, where there is weak power of the tax authority and low trust in the tax authority, there is likely to be a reduction in tax compliance. With high power combined with low confidence, there tends to be an increase in compliance with the coercive tax obligation. On the other hand, when there is high trust with weak power, there tends to be an increase in the fulfillment of the voluntary tax obligation. That is, high compliance can result from both perspectives, however, there is a qualitative difference between coercive and voluntary compliance (Kirchler et al., 2008).

In practice, power and trust have dynamic relationships where one can influence the other. A deliberate increase in audits and fines can decrease honest taxpayer confidence. However, if the increase in audits takes place with a focus on combating fraud and based on tax justice, there tends to be an increase in trust in the tax authorities. Similarly, an increase in trust can generate an increase in power, as the work of the tax authorities is facilitated when it has the support of the population (Kirchler et al., 2008).

2.2 Cooperative Compliance

The main function of the Tax Administration (TA) is to tax and collect taxes according to the law, this function being a legal obligation (Alink & Kommer, 2011). In this context, a tax gap arises, which consists of the difference between potential revenue and actual revenue (Alm & Soled, 2017). Reducing this fiscal gap is one of the greatest challenges for Tax Administration (Franzoni, 1998). Defined basically, the tax gap occurs when the taxpayer does not comply with tax legislation.

When it comes to the spontaneous fulfillment of tax obligations by taxpayers, the inspection model focused on punishment has not proven to be efficient. This can be directly linked to the limitation of resources and the imbalance of information available to the tax authorities in relation to the taxpayer. Thus, a tax compliance regime is needed that punishes taxpayers who do not comply with the legislation and benefits those who comply with their tax obligations (Ventry, 2008).

Coercive power is the possibility of curbing tax evasion and encouraging voluntary compliance with tax obligations through inspection (Raven et al., 1998). This power is possibly the form most commonly used by tax authorities in the pursuit of encouraging voluntary compliance (Kastlunge et al., 2009; Castro & Scartascini, 2015). However,

according to Almeida (2017), traditional, individual, and posterior audits are important for public coffers, but, in principle, they are not sufficient for broad tax compliance.

In view of the historical conflicting relationship between the Tax Authorities and the taxpayer, making the transition to a cooperative compliance model, where there is cooperation between the parties, is not easy as a real change in behavior is required, both from the tax authorities and the people, be they physical or legal entities (Owens, 2012).

Basically, the TA obtains its information through legal structures or voluntarily from taxpayers and tax intermediaries (tax consultants and financial institutions). This voluntary action should encourage taxpayers to engage in a relationship with the tax authorities based on cooperation and trust, with both parties going beyond their legal obligations. This is what the Organization for Economic Co-operation and Development (OECD) originally called an Enhanced Relationship in 2008, being one that favors collaboration over confrontation (Simone et al., 2013).

Subsequently, in 2013, the OECD adopted the term Cooperative Compliance. This change occurred mainly because the expression Enhanced Relationship generated doubts about the relationship between the tax authorities and the taxpayer and misunderstandings about the principle of equality. Furthermore, Cooperative Compliance is entirely consistent with managing compliance risk (Simone et al., 2013).

According to Fontes (2020), a better relationship with the taxpayer aims to reduce the tax gap and, consequently, increase the collection of the tax owed. Therefore, the following hypothesis is proposed:

H1 - Tax compliance action by the Tax Authorities reduces the tax gap and increases the tax owed.

H2 – The tax owed before and after the tax compliance action by the Tax Authorities has a statistically significant difference.

An important point is that, given the increasing complexity of market relations, technologies, and tax systems, the Tax Administration-taxpayer relationship has gained a tripartite connotation with the growing importance of tax advisors. These are represented by companies specialized in tax consultancy and law and accounting firms that, in addition to working with aggressive tax planning (which represent challenges for the tax authorities of different countries), help taxpayers to understand the complexity of the legislation and to comply with the internal risk management processes that are directly linked to corporate governance (OECD, 2008).

In the context of Cooperative compliance, the Tax Administration expects that, in addition to legally required information, taxpayers will disclose information where there is a significant degree of tax uncertainty or unpredictability or where the Tax Administration has publicly indicated that the matter is of concern. From the taxpayers' point of view, voluntary information should occur when there is a difference in interpretation between themselves and the Tax Administration or when the latter needs to understand important aspects to reach correct conclusions (Eberhartinger & Zieser, 2021).

In this way, Cooperative compliance is based on a collaborative relationship, in an environment of trust and cooperation. For this base to be achieved, efforts by both the tax authorities and taxpayers must be made (Huiskers-Stoop & Gribnau, 2019). It is up to the tax authorities to take the first steps in bridging this relationship (OECD, 2013).

In general, for the implementation of Cooperative compliance, there is no need to change the legislation and it is intended for specific groups of taxpayers defined by objective criteria. Its models are firmly based on the general strategy of the Tax Administration and with great importance for the engagement between public servants and taxpayers (Almeida, 2017).

The implementation of the Cooperative compliance program is a major challenge and requires changes in the culture and behavior of the parties involved. On the side of the Tax Authorities, it is essential that work processes and attitudes are aligned with the new methodology and that there is a preventive approach focused on problem solving. As for the taxpayer and tax intermediaries, constant attention is expected that aligns with the high level of tax control (OECD, 2013).

In the Cooperative compliance strategy, each category of taxpayer needs specific attention and the tax authorities' response must be guided according to the taxpayer's behavior. Legislative-compliant behavior requires support, as non-compliant behavior may require more severe action. In summary, the tax authorities should aim at cooperation, when possible, and use the force of law (enforcement), if necessary. This strategy is best understood through the Australian Tax Administration's compliance model, as shown in Figure 1.

Figure 1: Australian Tax Administration Compliance Model

Taxpayer's behavior	Compliance Strategy	High
Decides not to comply	Use the full force of the law	
Does not want to comply	deter or detect	Level of compliance costs
Tries, but doesn't always manage to comply	Help to comply	
Wants to do the right thing	Simplify	
Apply pressure from below		Low

Note: adapted from the Australian Taxation Office (2019, online).

According to Figure 1, the taxpayer behaves in different ways

(left side of figure). In this context, for each behavior, there must be a specific compliance strategy (right side of figure).

In such a way, when the taxpayer "wants to do the right thing", it is up to the Tax Authorities to simplify this process. On the other hand, at the top of the triangle in Figure 1, if the taxpayer decides not to comply with his tax obligation, it is up to the tax authorities to use the full force of the law.

There are two other points worth mentioning in the model: the objective of creating pressure for the maximum number of taxpayers to act at the base of the triangle; and realizing that the cost of compliance increases when there is more resistance to meeting tax obligations.

In a research carried out by Bezerra et al. (2021), it was found that after carrying out a tax compliance action carried out by the Federal Revenue Service of Brazil, the Tax Authorities, after detecting irregularities by some taxpayers, instead of fining them, initially clarified and then allowed regularization without adopting punitive measures. Measures such as these would be reserved for those who did not seek regularization by the stipulated deadline. After this action, it was observed in later years that taxpayers increased the amounts of their taxes paid or the installments. Thus, hypotheses 3 and 4 are:

H3 – Adherence to the tax compliance action of the Tax Authorities varies according to the taxable income of the taxpayer.

H4 - Adherence to tax compliance action by the Tax Authorities varies according to the calendar years under analysis.

Research shows that the quality of the relationship between the Tax Administration and taxpayers is a relevant factor in complying with tax obligations and that it is of paramount importance that resources are allocated to programs that aim at the cooperative relationship between those involved (Feld & Frey, 2002; Gangl et al., 2019).

It should be noted that, within the scope of this work, the tax compliance actions presented are understood to be of a cooperative nature, and follow the guidelines of the Cooperative compliance programs.

3 Methodology

3.1 Research Classification and Focus

This research has an exploratory character (Collis & Hussey, 2014), in which a quantitative approach was used (Minayo & Sanches, 1993), focusing on investigating changes in the collection of the sector under analysis, in regard to voluntary fulfillment of tax obligations. It also analyzed the amount of adhesion according to the size of the taxpayer and the calendar years under analysis, after the tax compliance action implemented by the Special Secretariat of the Federal Revenue of Brazil (FRB) in 2019, which focused on raising the voluntary compliance with the tax obligation, through increased power and, above all, confidence in the tax authority. That is, the action was based on the three dimensions of the Slippery Slope Model.

3.2 Database and Target Population

The analysis was carried out using the longitudinal database of the Federal Revenue regarding the tax compliance action, carried out in 2019, in a certain economic sector in the state of Ceará, containing a total of 531 individual taxpayers, referring to a population of 630 who make up part of the selected sector. The data were made available by the FBR, through the extraction from the Individual Income Tax Return (DIRPF) database. The subjects of this research are individual taxpayers from a specific sector, who in 2019 participated in the Tax Compliance action. This sector of the economy has an annual revenue of approximately 330 million reais. It should be noted that, in respect of the Electronic Manual of Fiscal Secrecy (e-MSF), approved by Ordinance RFB No. 4,820 on November 19, 2020, the referred sector will not be disclosed (RFB, 2020).

3.3 Data Analysis Technique

To analyze the data, we initially used descriptive statistics, which had been adopted to explore the profile of taxpayers. Thus, the techniques of number, mean, median, error, deviation, interval, minimum, maximum, total, and coefficient of variance were used. Additionally, the Friedman Test was used to determine whether taxable income showed significant differences, and the Pairwise Method was adopted to perform a comparative analysis between the years. These analyzes were performed using SPSS v.28 software.

Table 1 shows the descriptive statistics of the taxable income of these taxpayers, between 2015 and 2019, after the deadline granted by the Federal Revenue in the compliance action. Originally, there were 573 contributors in the database, but it was necessary to clean the data, excluding 42 contributors, 26 of which had not worked in the area in any of the years analyzed and 16 had invalid information, resulting in a final database with 531 contributors. There is a year-to-year oscillation regarding the number of taxpayers who made the declaration or were omitted. Such fluctuation may occur owed to the taxpayer not having worked in the sector in a given year, or having chosen not to send the declaration.

Taking the year 2019 as an example, Table 1 shows that the average taxable income was BRL 699,418. However, given that the coefficient of variation was greater than 50%, the mean is not an adequate measurement for the data (Laureano, 2011). Thus, the median, which had

a value of R$ 121,208.45, shows more relevant data.

The total of taxable income, in 2019, from all taxpayers in the base was BRL 333,622,446.75. To have a parameter of what this represents, the initial budget of the State of Ceará, provided for in the Annual Budget Law (ABL) of 2019 was R$137,674,391.69 for the Secretary of Culture, R$106,705,408.00 for the Tourism Department and R$96,173,251.00 for the Environmental Department, making a total of R$ 340,553,050.69 (Ceara, 2021). A very close value to that reached by the sector under analysis.

In general, from the Friedman test, it is noted that taxable income showed significant differences, as can be seen in Table 2.

Table 2: Friedman test

Taxable Income 2015	3,32
Taxable Income 2016	2,53
Taxable Income2017	3,21
Taxable Income 2018	2,88
Taxable Income 2019	3,06
N	408
chi-square	63,425
df	4
Significance Sig.	0,000

However, when performing the comparative analysis between the years, it can be seen from Table 3 that there was no significant difference between the

Table 1: Descriptive Statistics of Taxable Income

		Taxable Income 2015	Taxable Income 2016	Taxable Income 2017	Taxable Income 2018	Taxable Income 2019
N	Valid	450	468	494	507	477
	Omitted	81	63	37	24	54
Mean		745.252,37	655.800,78	663.784,76	647.308,98	699.418,13
Median		109.475,47	113.143,37	106.852,36	105.871,55	121.208,45
Error deviation		2.072.767,62	1.878.718,84	1.888.482,07	1.861.213,67	1.978.903,05
Interval		18.425.120,14	18.289.256,11	18.640.933,44	17.189.198,53	19.564.934,44
Minimum		0,00	0,00	0,00	0,00	0,00
Maximum		18.425.120,14	18.289.256,11	18.640.933,44	17.189.198,53	19.564.934,44
Total		335.363.566,41	306.914.767,32	327.909.671,67	328.185.654,25	333.622.446,75
Variance Coefficient		278%	286%	285%	288%	283%
Percentiles	25	47.085,35	46.429,09	45.070,46	44.491,62	49.307,36
	50	109.475,47	113.143,37	106.852,36	105.871,55	121.208,45
	75	413.538,15	354.271,87	392.046,92	376.525,99	391.374,70

Nota. Prepared by the authors. Amounts in Brazilian Reals at December/2019 prices – IPCA

years 2015 and 2017, as well as in the relationship between the years 2019 and 2018, and 2017.

Considering that the tax owed derives from tax collection, the results presented in Tables 2 and 3 demonstrate the importance of calendar years being analyzed both in the global and individual contexts.

The data were made available by the FRB, by means of extraction from the DIRPF database. The extraction was carried out with data from the calendar years between 2015 and 2019, the period of the compliance action by the Federal Revenue. This database identifies, individually and within each year, the following information on the taxpayer: the date of submission of the original or amended tax return; taxable income, deductions, tax base and tax owed (Figure 2). Thus, it is possible to analyze this information before and after the compliance action. In this sense, the values were inflated using the Broad National Consumer Price Index (IPCA) of the Brazilian Institute of Geography and Statistics (IBGE) for December 2019.

Figure 2: Database variables

Variable	Type	Description
Taxpayer	Nominal	531 tax-payers
Calendar year	Ordinal	5 years
Adjusted	Binary	0 - No; 1 - Yes
Declaration deadline	Continuous	
Taxable income	Continuous	
Deductions	Continuous	
Calculation basis	Continuous	
Tax owed	Continuous	

In the second moment, we need to understand how the taxpayer behaved with regard to the voluntary compliance with the tax obligation and, consequently, how the spontaneous increase of the tax owed occurred. We also need to verify the profile of the taxpayers who rectified their tax declarations, so the statements were based on the comparison, within each year, of the tax owed before and after the action, as well as the tax gap. Furthermore, the Kolmogorov-Smirnov and Wilcoxon tests were performed. These analyzes were performed using SPSS v.28 software.

Then, we proceeded to the analysis of latent classes. With this, it is possible to establish the ideal number of classes, through objective parameters (Magidson & Vermunt, 2002; Lanza et al., 2007; Haughton et al., 2009). In the present research, the application of this technique aimed to identify a series of mutually exclusive subgroups of individuals, based on a set of observed categorical variables, according to the latent variable of interest. Thus, through the Latent GOLD 5.1 software, models with 2, 3, 4, 5 and 6 latent classes were generated based on the results of log-likelihood, Bayesian information criterion (BIC) and coefficient of determination (R^2).

4 Results and Analysis

4.1 Tax Owed Before and After Compliance Action

With regard to the analysis of the compliance action, a comparison is made, within each year, of the tax owed before and after the action, as well as the tax gap. Furthermore, the Kolmogorov-Smirnov and Wilcoxon tests are performed. In addition, the profile of taxpayers who corrected their declarations is also verified. Through these analyses, it is possible to understand how the taxpayer behaved with regard to voluntary compliance with the tax obligation and, consequently, the spontaneous increase in the tax owed. Thus, the analysis was performed

Table 3: Comparisons by Pairwise Method

	Test statistics	Standard error	Standard Test Statistics	Sig.	Adj. Sig.[a]
Taxable income 2016-Taxable income 2015	0,795	0,111	7,185	0	0
Taxable income 2017-Taxable income 2015	0,114	0,111	1,03	0,303	1
Taxable income 2018-Taxable income 2015	0,439	0,111	3,963	0	0,001
Taxable income 2019-Taxable income 2015	0,263	0,111	2,38	0,017	0,173
Taxable income 2016-Taxable income 2017	-0,681	0,111	-6,155	0	0
Taxable income 2016-Taxable income 2018	-0,357	0,111	-3,221	0,001	0,013
Taxable income 2016-Taxable income 2019	-0,532	0,111	-4,804	0	0
Taxable income 2018-Taxable income 2017	0,325	0,111	2,934	0,003	0,034
Taxable income 2019-Taxable income 2017	0,15	0,111	1,351	0,177	1
Taxable income 2018-Taxable income 2019	-0,175	0,111	-1,583	0,113	1

comparing Tables 4, 5, 6 and 7, within each year.

It is important to highlight that, in order to have the real dimension of what the amount of tax owed before and after the action actually is, it is necessary that this value be relativized in relation to the size of the estimated tax gap. According to Warren (2018), in addition to the importance of estimating tax losses, the tax gap has the ability to connect the performance of the tax authorities with the behavior of the taxpayer. In the present study, the estimated tax gap was performed by the Internal Revenue Service, through cross-referencing of information.

Taking the 2018 calendar year as an example, in Table 5, it appears that the tax gap estimated by the FRB, before the compliance action, was BRL4,433,021.00. That is, in theory, if all taxpayers in this sector were in compliance with tax legislation, tax revenue would be increased by that amount. However, after the compliance action, the tax gap estimated by the FRB was reduced to BRL 1,728,878.20, which represents a reduction of 61%.

Thus, in 2015, the tax owed, after the compliance action, increased by 3.45%, which represents an increase of BRL 1,261,078.10 (Table 4). This increase represents a 13% reduction in relation to the estimated tax gap (Table 5).

In 2016, the tax owed, after the compliance action, increased by 8.38%, which represents an increase of BRL 2,586,009.20 (Table 4). This increase represents a 33% reduction in relation to the estimated tax gap (Table 5). Thus, it can be seen that this year, on the part of the taxpayers, there was a greater adherence to self-regulation than in 2015. In 2017, the tax owed, after the compliance action, increased by 11.97%, which represents an increase of BRL 3,711,532.80 (Table 4).

This increase represents a 58% reduction in relation to the estimated tax gap (Table 5). Thus, it is clear that this year, on the part of the taxpayers, there was a greater adherence to self-regulation than in 2015 and 2016.

In 2018, the tax owed, after the compliance action, increased by 10.33%, which represents an increase of BRL 3,271,402.60 (Table 4). This increase represents a reduction of 61% in relation to the estimated tax gap (Table 5). Although the absolute increase was lower than in 2017, it is clear that this year, on the part of the taxpayers, there was a greater adherence to self-regulation than in 2015, 2016 and 2017, in view of a greater reduction in the tax gap. Regarding 2019, there is no tax owed before the action, as taxpayers submitted their returns after the compliance action. Thus, the tax owed in 2018 before the action was used as a parameter. An increase of 18.04% was presented, which represents an increase of BRL 5,711,570.3 (Table 4). It is noteworthy that 2019 was the year that the compliance action took place and that this year presented BRL 37,376,006.10 of tax owed, the highest among those analyzed (Table 4). Thus, as shown in Tables 4 and 5, with their respective clarifications, the H1 is confirmed, that is, it is verified that the tax compliance action of the Tax Authorities reduces the tax gap and increases the tax owed. Also, as shown in Tables 4 and 5, it can be seen that, in terms of values, adherence to self-regulation increased between 2015 and 2019. Thus, the H4 is confirmed, that is, it appears that adherence to the tax compliance action by the Taxpayer varies according to the calendar years under analysis.

According to Ibrahim (2011), decay is the legal institute that extinguishes the right over time. In Brazil, normally, the tax authorities have 5 years to launch the tax credit (Carvalho, 2017). Thus, the closer the tax was to decay, the lower the adherence to self-regulation. Such an analysis is in line with the theory of Allingham and Sandmo (1972), which states that the taxpayer's decision is rational.

In this way, it can be seen that after the compliance action there was an increase in the tax owed of BRL 10,830,022.70, between 2015 and 2018. In addition, in 2019, there was an estimated increase of BRL

Table 4: Comparison of Tax Owed

Calendar year 2015					
		Before action	After action	Absolute difference	Percentage difference
N	Valid	450	450		
	Omitted	81	81		
Total		36.504.284,3	37.765.362,4	1.261.078,1	3,45%
Calendar year 2016					
		Before action	After action	Absolute difference	Percentage difference
N	Valid	468	468		
	Omitted	63	63		
Total		30.872.767,9	33.458.777,1	2.586.009,2	8,38%
Calendar year 2017					
		Before action	After action	Absolute difference	Percentage difference
N	Valid	494	494		
	Omitted	37	37		
Total		31.006.409,1	34.717.941,9	3.711.532,8	11,97%
Calendar year 2018					
		Before action	After action	Absolute difference	Percentage difference
N	Valid	507	507		
	Omitted	24	24		
Total		31.664.435,9	34.935.838,5	3.271.402,6	10,33%
Calendar year 2018 / 2019					
		Before action – 2018	After action – 2019	Absolute difference	Percentage difference
N	Valid	507	477		
	Omitted	24	54		
Total		31.664.435,9	37.376.006,1	5.711.570,3	18,04%

5,711,570.30, which totals BRL 16,541,593.00 (Table 4). To have a parameter of what this represents, the initial budget of the Municipality of Fortaleza, provided for in the Annual Budget Law (ABL) of 2019 for the Municipal Tourism Department of Fortaleza was BRL 17,047,001.00 (Fortaleza, 2021, online). A value very close to that achieved with the tax compliance action.

In this context, it is noted that the growth in tax owed is a result of the increase in voluntary compliance with the tax obligation by taxpayers, which is one of the main objectives of tax compliance actions, as stated by Gribnau (2015) and Szudoczky and Majdanska (2017). At first, it appears that the tax owed before and after the compliance action, between the years 2015 and 2019, form a non-normal distribution, given that the significance level was less than 0.05 in all variables (Table 6).

Table 6: Kolmogorov-Smirnov test

	Statistic	gl	Sig.
Tax owed 2015 – Before the action	0.375	408	0.000
Tax owed 2015 – After the action	0.371	408	0.000
Tax owed 2016 – Before the action	0.378	408	0.000
Tax owed 2016 – After the action	0.372	408	0.000
Tax owed 2017 – Before the action	0.381	408	0.000
Tax owed 2017 – After the action	0.370	408	0.000
Tax owed 2018 – Before the action	0.376	408	0.000
Tax owed 2018 – After the action	0.368	408	0.000
Tax owed 2019 – After the action	0.372	408	0.000

Table 5: Estimated tax gap comparison

		Calendar year 2015			
		Estimated Gap – Before action	Estimated Gap – After action	Absolute difference	Percentage difference
N	Valid	450	450		
	Omitted	81	81		
	Total	8.761.028,3	7.622.094,5	-1.138.933,8	-13,00%
		Calendar year 2016			
		Estimated Gap – Before action	Estimated Gap – After action	Absolute difference	Percentage difference
N	Valid	468	468		
	Omitted	63	63		
	Total	6.174.553,6	4.136.950,9	-2.037.602,7	-33,00%
		Calendar year 2017			
		Estimated Gap – Before action	Estimated Gap – After action	Absolute difference	Percentage difference
N	Valid	494	494		
	Omitted	37	37		
	Total	5.271.089,7	2.213.857,6	-3.057.232,1	-58,00%
		Calendar year 2018			
		Estimated Gap – Before action	Estimated Gap – After action	Absolute difference	Percentage difference
N	Valid	507	507		
	Omitted	24	24		
	Total	4.433.021,0	1.728.878,2	-2.704.142,8	-61,00%
		Calendar year 2019			
		Estimated Gap – Before action			
N	Valid	477			
	Omitted	54			
	Total	4.485.120,8			

In addition, it is verified, by the Wilcoxon test, that the variables analyzed before and after the tax compliance action of the tax authorities, between calendar years 2015 and 2019, have a statistically significant difference, given that the level of significance was lower than 0.05 (Table 7).

Thus, as shown in Tables 6 and 7, the H2 is confirmed, that is, it is verified that the tax Owed before and after the tax compliance action of the Tax Authorities has a statistically significant difference.

Overall, these findings emphasize the significance of tax compliance actions in promoting voluntary compliance, reducing the tax gap, and strengthening the trust between taxpayers and tax authorities. By understanding the factors that influence taxpayer behavior and implementing targeted compliance strategies, tax authorities can foster a culture of compliance and enhance overall tax system effectiveness.

Table 7: Wilcoxon test

	Tax Owed 2015-Before - Tax Owed 2015-After	Tax Owed 2016-Before - Tax Owed 2016-After	Tax Owed 2017-Before - Tax Owed 2017-After	Tax Owed 2018-Before - Tax Owed 2018-After	Tax Owed 2018-Before - Tax Owed 2019-After
Z	-5,892	-6,167	-8,595	-7,627	-6,255
Significance Sig. (2 extremities)	0,000	0,000	0,000	0,000	0,000

4.2 Latent Classes

Latent class analysis aims to identify a series of mutually exclusive subgroups of individuals, based on a set of observed categorical variables, according to the latent variable of interest.

Table 8: Model Fit Measurements

N° Cluster	Npar	Log-likelihood (LL)	BIC (based on LL)	R^2
2	9	-44292,7177	88642,5777	0,9758
3	20	-42981,8645	85308,3963	0,9738
4	35	-41865,5555	839653,3308	0,9425
5	54	-41830,999	84004,8515	0,9216
6	77	-41810,5359	84109,9555	0,9114

In Table 8, based on taxpayers' taxable income, for the years between 2015 and 2019, the measurement values of the models are presented. Models with 2, 3, 4, 5 and 6 latent classes were generated with reference to the results of log-likelihood, Bayesian information criterion (BIC) and coefficient of determination (R^2).

Bearing in mind what was exposed by Haughton et al. (2009), that after generating the models, the model that presents the best fit should be selected, according to the criterion adopted in the research, and observing the fact that the higher the R^2 value and the lower the BIC value, the better the fit of the model, we opted for the model of group 3, which has the second highest R^2 and the third lowest BIC. Groups 2 and 4 were excluded because they had the highest BIC values. As for groups 5 and 6, they were excluded because they had the lowest R^2 values. As can be seen in Table 9, group 3 has three classes, the first with 58.24% of taxpayers, followed by the second with 30.99% and the third with 10.77%.

Table 9: Size of Latent Classes

Group N°	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
2	0,2019	0,7981				
3	0,5824	0,3099	0,1077			
4	0,555	0,241	0,1259	0,077		
5	0,5455	0,0733	0,0774	0,2451	0,0588	
6	0,5447	0,1315	0,1099	0,1254	0,0111	0,0773

Based on the taxable income of taxpayers, for the years between 2015 and 2019, the following averages are found according to Table 10. Thus, it is clear that the first class has an average taxable income of BRL 53,959.40, the second an income of BRL 334,797.90 and the third an income of BRL 3,954,868.00.

Table 10: Average Taxable Income Class

	Class 1	Class 2	Class 3
Size	0,5824	0,3099	0,1077
	Taxable income		
Mean	53.959,40	334.797,90	3.954.868,00

In Table 11, there is a list of the number of rectified returns, by class, between the years 2015 and 2018. In relation to 2019, there are none rectified before the action, as taxpayers sent their statements after the compliance action. This justifies the percentage difference between Tables 10 and 11, referring to the participation of taxpayers in each class. According to Table 11, it can be seen that between 2015 and 2018 17.17% of the statements were rectified after the compliance action. Thus, proportionally,

classes 1, 2 and 3 had very similar rectifications, being 17.07%, 16.40%, and 19.08%, respectively.

Table 11: Rectified by Class (2015 - 2018)

			Group 3			
			Class 1	Class 2	Class 3	Total
Rectified	No	Score	816	525	246	1587
		% do Total	42,59%	27,40%	12,84%	82,83%
	Yes	Score	168	103	58	329
		% of total	8,77%	5,38%	3,03%	17,17%
	Yes	% within the Class	17,07%	16,40%	19,08%	17,17%
Total		Score	984	628	304	1916
		% of total	51,36%	32,78%	15,87%	100,00%

Thus, as shown in Table 11, the H3 is refuted, that is, it is verified that the adhesion to the tax compliance action of the Tax Authorities does not vary according to the taxable income of the taxpayer. This lack of variation suggests that factors other than taxable income might be more influential in determining taxpayers' decisions to adhere to the compliance action.

Consequently, this insight underscores the intricate nature of taxpayer behavior and underscores the necessity of encompassing a wider spectrum of factors when evaluating the effectiveness of compliance actions.

5 Conclusion

The results made it possible to identify that after the compliance action there was an increase in the tax owed of BRL16,541,593.00, between the years 2015 and 2019. To have a parameter of what this represents, the initial budget of the Municipality of Fortaleza, provided for in the Annual Budget Law (ABL) of 2019, for the Municipal Tourism Office of Fortaleza, was BRL17,047,001.00 (Fortaleza, 2021). A value very close to what was achieved with the action. Furthermore, using the Wilcoxon test, it was found that, in all the years analyzed, there was a statistically significant difference between the tax owed before and after the compliance action.

Regarding adherence to self-regulation, in terms of values, it was found that this increased between 2015 and 2018. Although it is not possible to say with certainty the reason for this increase between the years, it is possible to believe that part of this fact is owed to tax decay. Such an analysis is in line with the theory of Allingham and Sandmo (1972), which states that the taxpayer's decision is rational. In addition, according to the latent class analysis, divided into three groups, based on taxable income, it was found that the participation of adherence to self-regulation was very similar between the groups, which demonstrates that adherence did not vary according to the group based on taxpayer's taxable income.

Furthermore, regarding the performance of the Tax Authorities in the compliance action, the best result is measured by the reduction of the tax gap. Thus, it was found that, in the years 2015, 2016, 2017 and 2018, there was a significant reduction in the tax gap of 13%, 33%, 58% and 61% respectively.

In this context, it is noted that the growth in tax owed is a result of the increase in voluntary compliance with the tax obligation by taxpayers, which is one of the main objectives of tax compliance actions, as stated by Gribnau (2015) and Szudoczky and Majdanska (2017).

It is also noted that the increase in voluntary compliance with the tax obligation is the result of the tax compliance action that sought to increase the power of the tax authority, as well as increase confidence in the tax authority.

To increase the power of the tax authority, the action demonstrated to taxpayers that it had identified possible illegalities in the sector. In addition, to increase confidence in the tax authority, the action had the following objectives: to raise tax morale, both for the Treasury and for taxpayers; promote tax education; reduce litigation; demonstrate, with transparency, the performance of the Federal Revenue Service. These results confirm the studies presented by Kirchler; Hoelzl; Wahl, 2008, Wahl; Kastlunger; kirchler, 2010, Kogler et al, 2013, Da Silva; Guerreiro; Flores, 2019, Batrancea et al, 2022.

In view of the above, it was found that the tax compliance action presented a positive return for the Tax Authorities with the reduction in the tax gap and the increase in the tax owed. In addition, the action also presented advantages to taxpayers, since, when there is a spontaneous regularization, there is less possibility of facing a tax procedure, as well as a reduction in administrative costs and in the amount of litigation.

Thus, it is noteworthy that this research presented, in addition to practical contributions to the improvement of future tax compliance actions that may be implemented at the Federal level, a theoretical contribution to the Slippery Slope Model, as the action was based on its three dimensions. That is, there was greater voluntary compliance with the tax obligation after a compliance action that was guided by the increase in power and, mainly, confidence in the tax authority.

Therefore, this theoretical contribution highlights the importance of the Slippery Slope Model in understanding taxpayer behavior and in developing more effective tax compliance strategies. By recognizing

the crucial role of power and trust in the tax authority, it is possible to adopt more informed and targeted approaches to encourage voluntary compliance with tax obligations and strengthen the tax system as a whole.

This study presents as a limitation the fact that it was carried out based on only one tax compliance action carried out by the Federal Tax Authorities and in only a certain economic sector of the State of Ceará. Therefore, it is suggested that future research be carried out in other sectors of the economy, as well as based on compliance actions carried out by other Tax Authorities, whether State, District, or Municipal.

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