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Tax Monitoring By Sped And The Evasion Decision: Taxpayer Perception

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ABSTRACT

This study evaluates taxpayers' perception of the influence of an environment characterized by fiscal monitoring on reducing the *tax gap*. The literature does not present a consensus on whether greater monitoring and inspections may be able to reduce the *tax gap* or increase *tax compliance*. In this aspect, the analysis of the perception of taxpayers under monitoring allows evaluating the main determinants of the *tax gap* in such an environment, using PLS-SEM structural equation modeling as a methodology, as they are latent variables. The results indicated that there was a significant influence of most of the main determinants of the *tax gap* and tax monitoring in reducing the *tax gap* and increasing *tax compliance*. This result raises the need for studies that deepen the knowledge of the literature on taxpayer behavior and its effects on *compliance* and tax evasion.

Keywords: *Tax Gap*. *Tax compliance*. Tax Monitoring.
JEL: H26; H21; H29.

SUMMARY

1. INTRODUCTION

Stimulated by an environment of economic and political crisis, recent legislative proposals by the Brazilian federal government have highlighted one of the main challenges faced by government officials: the uncontrollable increase in public spending. Amid the difficulty of implementing the historical alternatives used to cover these expenditures, which are the creation of new taxes or an increase in the tax burden, a difficulty that stems from the fact that taxpayers already face a high tax burden, the government is left with the task of maximizing its tax collection without changing the tax legislation, seeking to reduce the information asymmetry with taxpayers in an attempt to reduce the *tax gap*, which is the gap between the revenue established in tax legislation and that which is actually collected by the public coffers, resulting from the inefficient collection by tax authorities and tax evasion, among other elements (MAZUR; PLUMLEY, 2007).

In this quest for less information asymmetry with taxpayers, one of the main difficulties for policymakers in emerging countries is to encourage increased levels of *compliance* (CUMMINGS *et al.*, 2009). Asymmetry is stimulated by taxpayers who constantly challenge the government to identify their transactions through their own or third-party returns (LEDERMAN, 2010) and favors an environment conducive to the existence of the *tax gap*.

This link between information asymmetry and the increase in the *tax gap* leads to a weakening of tax collection and, as a result, smaller budgets require the implementation of public policies for fiscal monitoring and audits (TELLE, 2013). Specifically in Brazil, one of the objectives of implementing SPED was to increase access to taxpayer information, which would enable greater efficiency by tax authorities and a possible reduction in the *tax gap*. The initial priority of the tool was based on consumption taxes due to their representativeness in tax collection, a striking feature of emerging countries (KEEN; SMITH, 2006).

The *tax gap* literature indicates that increases in penalties, *tax compliance*, technology, and enforcement have a positive influence on reducing the *tax gap* when analyzed individually (CASABURI; TROIANO, 2016; CUMMINGS *et al.*, 2009; DORAN, 2009; LEDERMAN, 2018; RACZKOWSKI, 2015; TELLE, 2013), these being its main determinants. However, Bird and Zolt (2008) question the assertion that greater monitoring and enforcement increase *compliance* and tax collection, with Bird (2015) also noting the relevance of the administrative and *compliance* costs associated with tax collection, raising doubts about its effectiveness.

By indicating results that differ from the dominant literature, these studies reinforce the

contribution of this work, which aims to answer the following question: *does the use of digital tax practices by the tax administration contribute to reducing the tax gap in the perception of taxpayers?* Thus, the objective is to assess, from the taxpayers' perspective, whether the influence of tax monitoring resulting from SPED has impacted the *tax gap* in Brazil. Considering the impossibility of directly measuring taxpayers' perceptions, latent variables were used, analyzed through PLS (*Partial Least Squares*) modeling, a general approach for prediction and cause-and-effect inference.

The study is based on agency theory, in which the principal-agent relationship is represented, respectively, by the government and taxpayers. The agency relationship can be found in various situations and at all levels of organizational management (JENSEN; MECKLING, 1976). Although the relationship discussed here is not based on a personal contract between principal and agent, there is the same duty and responsibility as in a contract established by tax legislation itself. In the case of Brazil, where most taxes are assessed by approval, the agent (taxpayer) assumes responsibility for calculating and paying the tax, undertaking to seek the utility function of the principal (government), complying with the legal regulations issued by or on behalf of the latter.

In view of the above, the results of this study present new answers to solidify the literature on the *tax gap*, as well as its main determinants. In this context, it provides more robust information on taxpayer behavior, or their perception, in the face of the implementation of a tax monitoring system, an event that has been demanded in the literature to address its effects (BIRD, 2015; BIRD; ZOLT, 2008; JOHNSON; MASCLET; MONTMARQUETTE, 2010), as well as questions about the use of technology to compare information with third-party declarations (ALM, 2021; ALM; SOLED, 2017; CASABURI *et al*., 2016). Similarly, these responses regarding taxpayer behavior support studies on fiscal policies to be developed by tax authorities and legislators in order to improve the tax system, aiming at more efficient tax collection (MCMANUS; WARREN, 2006).

With regard to taxpayer perception, its analysis generates insights to enable the development of alternatives to contain the *tax gap* (LEDERMAN, 2018), reducing the impacts of the frequent economic crises faced by countries, as well as being relevant for the consolidation of literature addressing the persistent problem of tax evasion, its extent, and its behavior (ALLINGHAM; SANDMO, 1972).

In this context, in the case of Brazil, SPED contributes to the analysis of enforcement in question, allowing comparison with the expectations placed on it in terms of its ability to help

reduce the *tax gap*.

2. LITERATURE REVIEW

2.1. *Tax gap*

The origin of the *tax gap* is linked to non-*compliance*, which in turn stems from dissatis-faction with governments and their spending, apathy, and corruption, as some examples, and may also include the complexity of tax legislation. In this context, understanding non-*com-pliance* is essential to developing strategies to encourage *tax compliance*, intelligence that can be obtained by tax authorities through audits or external sources, such as statistics and literature on taxpayer behavior and risk management (MCMANUS; WARREN, 2006).

To quantify the relevance of the issue, the IRS indicates that the latest estimates of the *tax gap* in the US for the fiscal years between 2011 and 2013 averaged US$ 441 billion per year (IRS, 2021), which means that 83.6% of taxes are paid voluntarily and on time. These indica-tors showed insignificant changes in the publication for the 2019 fiscal year. European Union member countries had an average VAT gap of 11.5% in 2020, with the largest gap in Romania, at 34.3%, and the smallest gap in Sweden, at 1.9% (PONIATOWSKI *et al*., 2020).

Given its importance in tax collection, the containment of tax evasion, a phenomenon that contributes to the *tax gap*, must be based on multidirectional and multifaceted tasks by the tax authority, considering the characteristics of each country, with specific solutions being neces-sary. Thus, the methods and tools used to repressively inhibit the *tax gap* must be strict, but at the same time gentle, in the pursuit of trust, providing information and instituting educational campaigns (RACZKOWSKI; MRÓZ, 2018).

Finally, mention is made of the recurring proposal to reduce tax rates to contain the *tax gap*. However, the reduction in tax evasion probably occurs because companies are motivated by excessive bureaucracy and rampant corruption, rather than simply by tax rates. Therefore, a policy aimed at combating corruption is more beneficial, as it generates economic gains by increasing *tax compliance* (NUR-TEGIN, 2008).

2.2 Penalties

Allingham and Sandmo (1972) indicate that the decision to evade taxes is based, among

other factors, on the size of the penalty to be applied if the fraud is discovered by the tax authorities. Derived from this reasoning, considering the intent of the fraud, penalties for underpaying taxes should be significantly higher than conventional fines for simple late payment when used to punish fraud offenses, in order to compensate for low audit rates and the reduced probability of the government detecting these minor payment frauds (Gergen, 2010).

It should be noted that, with the predominance of the works of Becker (1968) and Allingham and Sandmo (1972) as references for studies on the *tax gap*, scientific advice generally values the fight against tax evasion based on audits and high fines to encourage rational taxpayers, with a view to optimizing the utility of contributing honestly with their participation (KIRCHLER *et al.*, 2009). On the other hand, Cummings *et al.* (2009) note that high penalties may not be effective, creating an environment of bribery and corruption, resulting in lower tax collection.

Penalties are also used to increase *compliance*, i.e., they aim to ensure that taxpayers follow the tax code. However, these penalties are linked to the need to discover non-*compliance*, making it important in these cases to carry out inspections (MORSE, 2009). On the other hand, taxpayers may overestimate the probability of non-*compliance* being detected and the penalty, which would tend to increase *compliance* and the expected cost of evasion (LEDERMAN, 2018).

For an optimal tax policy, from a behavioral approach, there are different conclusions and recommendations. Thus, considering the point of view of social welfare, tax evaders should receive higher taxation and penalties and greater monitoring, and honest taxpayers should receive lower taxes and penalties and greater monitoring (LISI, 2015).

2.3 *Tax compliance*

The relationship between the *tax gap* and *tax compliance* is extremely intrinsic. The level of *compliance* is so relevant to the *tax gap* that it is one of the pillars of its measurement, along with the *police gap*. In many cases, the definition of the *compliance* gap is given by the definition of the *tax gap* itself (FISCALIS, 2016). So much so that the concept of the *tax gap*, although defined in various ways, was in most cases developed by tax agencies with the aim of capturing tax revenue lost due to non-*compliance* (GEMMELL; HASSELDINE, 2012). Further evidence of this close relationship is that, given the absolute size of the potential error in measuring the *tax gap*, and given that estimates are not sufficiently accurate, they will also be

insufficient to estimate reliable *tax compliance* trend rates (Toder, 2007).

In this sense, the most representative definition of the *tax gap* is given as the difference between the taxes actually collected and those that would be collected in full *compliance* and, consequently, the calculation of this estimate generates relevant information about non-*compliance* for a tax or tax system, including its evolution over time (DURÁN-CABRÉ *et al.*, 2019).

However, the main element of *tax compliance* is information, and aware of its importance for the development of appropriate tax policies and the elimination of the *tax gap*, some countries require taxpayers, in addition to their own returns, to provide information from third parties such as employees, other companies, or the financial sector, which accounts for 95% of the information obtained, making it difficult to engage in illegal activities (RACZKOWSKI, 2015). Empirical evidence supports that the existence of third-party tax information, especially associated with a type of withholding tax, is associated with high *tax compliance*, with the reverse also being true (ALM; SOLED, 2017).

The *compliance* gaps that affect the *tax gap* are tax evasion, which is the most common, tax avoidance, and amounts declared by taxpayers but not actually collected (MURPHY, 2019). Among these, the results presented by the IRS already indicated that the largest component of the *tax gap* is related to amounts declared lower than the actual amounts, emphasizing that *compliance* is higher when there are reports and/or withholding of information from third parties (FISCALIS, 2016).

In this vein, the basic model of individual *compliance* behavior implies that rational individuals tend to declare income lower than the actual amount in cases where the information from third parties with whom they are related and the sources of income from employers are imperfect (ALM, 2019). In other words, the most obvious way to increase *tax compliance* is to require third-party information so that it can be cross-checked (LEDERMAN, 2010).

Income subject to third-party reporting and withholding, such as wages, is reported with 99% *compliance*; with substantial third-party reporting but no withholding, declared with 95% *compliance*; income with some third-party reporting, declared with about 90% *compliance*; and income with little or no reporting, declared with approximately 50% *compliance* (MAZUR; PLUMLEY, 2007). Therefore, in order to obtain more information, one of the main problems for policy makers in emerging economies is to encourage high levels of *tax compliance* (CUMMINGS *et al.*, 2009).

2.4 Enforcement and monitoring

Strategies to contain the *tax gap*, more specifically tax evasion, include conventional policies, such as increasing inspection rates and, more frequently, combining this with stricter penalties. However, it should be noted that the announcement of enforcement has the effect of increasing the *compliance* rate of those taxpayers who are informed about an audit, but the *compliance* rate of those who know they will not be audited falls, and as a result, the net effect is that overall *compliance* also falls (ALM; MCKEE, 2006). Nevertheless, there is a U-shaped relationship between enforcement and tax evasion, in which *compliance* increases until a certain level of enforcement is reached, then decreases after that level (MENDOZA *et al.*, 2017 apud LEDERMAN, 2018). Although fines or just the threat of fines have, as mentioned, beneficial effects on *compliance*, they may not have the same effects as enforcement (LEDERMAN, 2018).

The existence of enforcement positively affects *tax compliance*, as observed not only in IRS studies but also in empirical studies. Enforcement can increase the expected future punishment for non-*compliance*, considering that poor performance suggests to the company that there is a probability of future enforcement and detection will increase. In such cases, an audit increases the incentive for *compliance*. Based on Becker's studies (1968), it is also considered that increasing the frequency of audits increases the probability of detection, thereby also increasing *compliance* (TELLE, 2013).

It should also be noted that an increase in the probability of enforcement, in the case of income taxes, does not necessarily result in a decline in tax evasion when a taxpayer has the possibility of compensating for increased monitoring of income by reporting income from less monitored sources, that is, to recharacterize their income where this procedure is possible in order to reduce the probability of monitoring by the tax authorities (JOHNSON *et al.*, 2010). Taxpayers respond to increased enforcement effectiveness only if they expect to be audited, i.e., enforcement procedures alone are insufficient incentives to comply when not accompanied by an increased expectation of enforcement (ALM; MCKEE, 2006).

In cases where audits are known to be based on revenue volume, taxpayers react to avoid stricter auditing by reducing their declared revenue to a level slightly below the eligibility threshold that would make them susceptible to this type of audit. This reaction varies among taxpayers depending on the traceability of their transactions, indicating that monitoring and information requirements are complementary in increasing *tax compliance* (ALMUNIA, 2015).

In the case of VAT monitoring, as well as its enforcement, the main feature is the analysis of paper trails of relationships with third parties, which are stronger when compared to other taxes, generating more information for tax authorities and facilitating tax collection. In countries with tools that enable *online* billing monitoring, such as the system implemented in Brazil, even more information can be provided. Another feature of VATs is that they are only effective in formal sector companies, which is why formal companies seek to negotiate with other formal companies so that they can deduct tax credits from their purchases of goods, suggesting that the formalization of the final stage of production can potentially contribute to the formalization of entire production chains (POMERANZ, 2015).

Bergman and Nevarez (2006) analyzed VAT return information and audit data to assess the impact of these audits on the *compliance* of companies in Chile and Argentina between 1997 and 2000. The selected countries have similar tax systems but, based on international measurement standards, show different performance in tax collection, with Chile having VAT evasion of around 22% and Argentina approximately double that.

The analysis of the data provided evidence to reject the argument that audits in these countries directly increased *compliance*, further indicating that sanctions have the undesirable effect of increasing tax evasion, especially among Chilean evaders. One possible explanation is that enforcement removes the threat of detection, which is no longer perceived as serious among entrenched evaders. This result contradicts those who point to convincing evidence that a high risk of detection discourages non-*compliance* (ALLINGHAM; SANDMO, 1972).

However, it should be noted that inspection technology allows tax auditors to have sufficient and up-to-date information on taxpayers, enabling the use of information from the public and private sectors, including information from the financial sector (BIRD; ZOLT, 2008).

Despite this, the aggregation of audit data is not capable of providing accurate information on tax evasion because it focuses on suspicious non-*compliance* declarations and, if this focus is successful, the aggregation will overestimate the size of the evasion. Thus, the most accurate picture comes from random audits (SLEMROD, 2019).

Despite studies indicating that audits do not result in improved *compliance* and reduced tax evasion, predictions of a persistent and steadily growing *tax gap* may be wrong, and instead, it seems much more likely that it will decrease in the future. One reason is that governments around the world have added new third-party *compliance* measures using new technologies to monitor taxpayers' economic activities, reducing opportunities to pay less than they owe by mistake or fraud. In addition, the *tax gap* also narrows as companies grow, with more direct and

indirect oversight of *tax compliance* (ALM; SOLED, 2017).

Thus, monitoring and analyzing the risk associated with all areas or types of non*compliance* related to a theoretical tax liability ensures that one type of non*compliance* that has been eradicated does not manifest itself in another form, and as a result, an overall reduction in the *tax gap* is possible (WARREN; MCMANUS, 2007).

2.5 Technology

Good tax administration is not defined solely by collection, but also by how that collection is carried out in order to collect the revenue stipulated in the legislation in the fairest and most efficient manner possible. Not surprisingly, tax administrations have focused on adopting new information technologies, as it is inconceivable to believe in a modern tax administration that performs its tasks efficiently without the use of IT (BIRD, 2015). Among the functions of tax administration is to gather information from various sources, public or private, in order to compare it with the information provided by the taxpayer. Despite this, all this information is useless without an efficient monitoring system or IT structure for data collection and storage (BIRD; ZOLT, 2008).

Thus, tax administrations have always had the basic challenge of finding a way to access more information about taxpayers and their activities, which until then was not complete, accurate, or timely. This has been significantly affected by technology, increasing the flow of available information, concentrated obviously in developed countries, but also emerging in developing countries with the support of international organizations such as the IMF and the World Bank. This information has improved tax collection capacity by enhancing the ability to track and analyze the trails of any and all transactions that leave some kind of trace in the electronic system. This makes it possible to retrieve information and transmit it across jurisdictional boundaries through inter-institutional government databases, international databases, and transparency agreements for analysis (ALM, 2021).

In this context, there is a rapidly growing body of literature addressing interventions that improve enforcement technology, such as the use of third-party declarations for cross-checking or the use of better audit algorithms, indicating that technology can substantially reduce tax evasion (CASABURI *et al*., 2016).

Technological advances have led to notable improvements in the efficiency of the tax administration process, particularly in terms of ease of processing and increased accuracy. The

possibility of using electronic returns allows for cross-checking of information with third parties and more efficient targeting of enforcement efforts. Empirical evidence supports the idea that the existence of third-party tax reports increases *tax compliance*, and the reverse is also true (ALM; SOLED, 2017).

The use of technology also allows for increased monitoring of taxpayers, suggesting a possible reduction in tax evasion. Perfect monitoring of electronic retail transactions, for example, can improve *tax compliance* and raise tax revenue levels. Higher detection probabilities reduce the marginal benefit of evasion, making it less attractive. Merchants cannot avoid taxes levied on sales by using an electronic payment method (JOHNSON *et al*., 2010).

A new trend in preventing tax evasion through technology is the use of algorithms, modeling the co-evolution of tax schemes with enforcement policies. This is because when tax legislation or enforcement procedures change to eliminate known forms of tax evasion, another more lucrative scheme may emerge. With algorithms, likely forms of tax evasion can be explored in response to changes in audit procedures, serving as an early warning to focus enforcement efforts, and procedures can be adjusted for better detection of tax schemes (HEMBERG *et al*. 2016).

Thus, it is clear that the digital age impacts all aspects of the global economy, and it would be no different with the *tax gap*. Unsurprisingly, the number of tax administrations that estimate it is growing. Measuring the *tax gap* transparently demonstrates the formatting of tax policy, tax collection performance, and taxpayer behavior on broad issues of economic growth, tax sustainability, and fiscal effort. These estimates can bring transparency and understanding to previously complex issues that have arisen in the digital age and, based on evidence, facilitate changes in the design, legislation, and administration of tax policy (WARREN, 2019).

It should be noted that VAT is probably the tax with the greatest potential for gains from the implementation of technology, as it allows for cross-checking of a taxpayer's purchases with the sales of others. Few developing countries have adopted this system to identify underreported values or fraud, and thus, those countries with less technological advancement are the ones that will have the most to gain (BIRD; ZOLT, 2008).

In the specific case of the VAT gap, the use of electronic payments, such as debit and credit cards, can encourage the fight against tax evasion, as can the use of broadband internet. There is a positive statistical relationship between cash withdrawals and tax evasion. Thus, it is understood that cashless payments prevent tax evasion, not the cards themselves, because if the cards are used for cash withdrawals, this would facilitate evasion, considering that a seller

can offer a discount to the customer in exchange for a cash transaction, as it is easier to escape taxation (IMMORDINO; RUSSO, 2018).

2.6 Hypotheses

Given the literature on the main determinants of the *tax gap*, which are penalties, *tax compliance*, enforcement, and technology, which seek to understand the existence of any impacts caused by the implementation of tax monitoring, the following hypotheses were developed:

Table 1 - Research hypotheses

Hypotheses	Expected Coefficient	Authors
H_{I_3}: An increase in tax penalties influences a reduction in *the tax gap*.	(+)	Allingham and Sandmo (1972), Kirchler, Kogler, and Muehlbacher (2009).
H_{I_5}: Increasing tax penalties influences an increase in *tax compliance*.	(+)	Doran (2009), Morse, (2009) and Lederman (2018).
H_2: Increased *tax compliance* requirements have an impact on reducing the *tax gap*.	(+)	Allingham and Sandmo (1972), Lederman (2010), Raszkowski (2015), Fiscalis (2016), Murphy (2019), Slemrod (2019), and Alm (2019).
H_{S_2}: Audits based on digital tax practices are more efficient in reducing the *tax gap*.	(+)	Bird and Zolt (2008), Pomeranz (2015), and Raczkowski and Mróz (2018).
H_{S_5}: Increased audits lead to increased *tax compliance*.	(+)	Bergman and Navarez (2006), Telle (2013), Pomeranz (2015), and Lederman (2018).
H_{6_2}: Digital tax practices have an impact on reducing the *tax gap*.	(+)	Casaburi and Troiano (2015), Bird (2015) Hemberg et al. (2016) Immordino and Russo (2018) and Alm (2021).
H_{6_5}: Digital tax practices influence the increase in *tax compliance*.	(+)	Bird and Zolt (2008), Wu, Ou, Lin, Chang, & Yen, (2012), Alm and Soled (2017), and Alm (2021).

Source: prepared by the author.

3. METHODOLOGY

This study sought to assess the possible impacts of SPED, as an instrument developed for effective tax monitoring, on reducing the *tax gap*, based on taxpayers' perceptions. Considering that this perception is not an observable variable, the methodology gave priority to this characteristic, using a specific tool for assessing latent variables. To this end, a quantitative, descriptive, deductive approach was used, with a collection and analysis method based on sampling.

The data were collected using the survey method, applied by sending electronic questionnaires to accountants and tax managers of taxpayers established throughout Brazil, using the *snowball* technique, at a single point in time.

3.1 PLS (partial least squares)

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The collected data were analyzed using PLS modeling, as this method is suitable for evaluating latent (unobservable) variables. Structural equation modeling (SEM) is based on techniques that combine regression and factor analysis, allowing for the simultaneous analysis of the relationship between latent variables and between these and measurement variables (HAIR *et al.*, 2014).

The structural model developed based on the determinants of the *tax gap* presented in the literature considers the relationships between the four latent variables (Penalties, *Tax compliance*, Enforcement, and Technology) and their relationships with their 27 indicators, variables related to the *tax gap* reduction variable, which in turn is related to six indicators used for its measurement. The dependent variables in the PLS approach are considered latent variables, but are also called constructs, reflecting the fact that they cannot be measured directly and must therefore be measured using indicators, collecting data for their quantification (CHIN *et al.*, 2003).

3.1.1 Indicators and relationships between constructs

Table 2 - Statements for the *Tax Gap* construct

Statements for the *Tax Gap* construct (ξ)	Authors
TG01 – The origin of *the tax gap* is related to non-compliance, which in turn is related to dissatisfaction with governments and their spending, apathy, and corruption.	McManus and Warren (2006).
TG02 – Curbing tax evasion and reducing the *tax gap* should be multidirectional and multifaceted tasks for tax authorities, adapted to the reality of each country, recognizing that there is no universal set of solutions.	Raczkowski and Mróz (2018).
TG03 – *The tax gap* is related to the complexity of tax legislation.	McManus and Warren (2006).
TG04 – The *tax gap* should be curbed in a repressive manner, through a combination of strict methods and tools, but at the same time in a gentle manner, building trust, providing information, and conducting educational campaigns.	Raczkowski and Mróz (2018).
TG05 – Although reducing tax rates is a recurring policy for reducing the *tax gap*, companies seek to go underground motivated by uncontrolled bureaucracy and rampant corruption, rather than tax rates.	Nur-Tegin (2008).
TG06 – The *tax gap* can be stopped from growing by using third-party information cross-checking and new technologies to monitor taxpayers' economic activities, reducing opportunities for evasion.	Alm and Soled (2017).

Source: prepared by the author.

Table 3 - Statements for the Penalties construct

Statements for the Penalties construct (η1)	Authors
PN07 – The decision to evade taxes, among other factors, considers the size of the penalty to be applied if the fraud is discovered.	Allingham and Sandmo (1972).
PN08 – Combating tax evasion is based on inspections and heavy fines to encourage rational taxpayers, with a view to optimizing the utility of contributing honestly through their participation.	Kirchler, Kogler, Muehlbacher (2009).
PN09 – From a social welfare perspective, tax evaders should receive higher taxation and penalties and strict monitoring, while honest taxpayers should receive lower taxes and penalties and greater monitoring.	Lisi (2015).
PN10 – Taxpayers may overestimate the probability that non-compliance will be detected, as well as the penalty, which would tend to increase compliance.	Lederman (2018).
PN11 – Small and medium-sized enterprises have high rates of non-compliance because taxpayers are rational actors and compliance decisions depend on the probability of detection and the size of penalties.	Logue and Vettori (2011).
PN12 – Taxpayers pay taxes to avoid punishment, and if that punishment is not sufficiently likely or severe, tax evasion will occur.	Logue and Vettori (2011).

Source: prepared by the author.

Table 4 - Statements for the *Tax Compliance* construct

Statements for the *Tax Compliance* construct (η2)	Authors
TC13 – The comparison of own information with third-party information by the government encourages tax compliance by taxpayers.	Raczkowski (2015).
TC14 – Taxpayers tend to declare lower income when they know that third-party information related to them and their sources of income is imperfect.	Alm (2019).
TC15 – The use of technology improves voluntary compliance rates, as taxpayers will be aware that their tax returns can be analyzed quickly and scientifically.	Wu et al. (2012).
TC16 – One of the main problems for policymakers is encouraging high levels of tax compliance.	Cummings et al. (2009).
TC17 – The complexity of legislation affects its interpretation, and what appears to be tax evasion may in fact be merely a misunderstanding of the rules.	Alm et al. (2010).
TC18 – In cases of doubt about legal interpretation, risk-averse taxpayers respond by overpaying their taxes.	Alm et al. (2010).

Source: prepared by the author.

Table 5 – Statements for the *Inspection and Monitoring* construct

| Statements for the Inspection and Monitoring construct (η3)	Authors
FM19 – In general, inspections promote tax compliance.	Lederman (2018).
FM20 – Announcing an audit of a taxpayer has the effect of increasing the compliance rate, just as the certainty of no audit contributes to a decline in compliance.	Alm and Mckee (2006).
FM21 – Audits have the effect of promoting non-compliance among taxpayers with a history of evasion, as they are no longer considered a serious threat.	Bergman and Navarez (2006).
FM22 – Although fines or the threat of fines have a beneficial effect on *compliance*, audits may not have the same effect.	Lederman (2018).
FM23 – When audits are known to become more rigorous upon reaching a certain revenue threshold, taxpayers react by declaring amounts slightly below the eligibility threshold that would make them susceptible to such audits.	Almunia, (2015).
FM24 – VATs, because they leave more traces of relationships with third parties, generate more information for tax authorities than other types of taxes.	Pomeranz (2015).
FM25 – Technology in audits allows tax auditors to have sufficient and up-to-date information on taxpayers, allowing information from the public and private sectors to be used, including information from the financial sector.	Bird and Zolt (2008).

Source: prepared by the author.

Table 6 - Statements for the *Technology* construct

Statements for the Technology construct (η4)	Authors
TEC26 – It is inconceivable to believe in a modern tax administration that performs its tasks efficiently without the use of IT – information technology.	Bird (2015).
TEC27 – The volume of information generated by taxpayers is not useful without an efficient monitoring system or an IT structure for data collection and storage.	Bird and Zolt (2008).
TEC28 – Technology has enabled access to more information about taxpayers and their activities, as well as improved the ability to track and analyze any and all transactions that leave a trail in the electronic system.	Alm (2021).
TEC29 – Data mining for *big data* allows the tax administration to identify taxpayer characteristics that are related to tax violations.	Alm (2021).
TEC30 – The use of algorithms enables artificial intelligence to anticipate specific modes of tax evasion and detect patterns of individual use that can be collectively utilized to create a sophisticated tax evasion scheme.	Alm (2021).
TEC31 – The use of technology improves voluntary compliance rates, as taxpayers will be aware that their tax returns can be analyzed quickly and scientifically.	Wu et al. (2012).
TEC32 – With algorithms, it is possible to adjust inspection procedures to better detect tax schemes, as new forms of tax evasion are likely to emerge in response to changes in legislation or inspection procedures.	Hemberg et al. (2016).
TEC33 – In the specific case of VAT, the use of electronic payments, such as debit and credit cards, can encourage the fight against tax evasion.	Immordino and Russo (2018).

Source: prepared by the author.

Figure 1 shows the influence that the variables representing the main determinants of the *tax gap* have on this variable, as well as the indirect influence of the *Tax Compliance* variable on the *Tax gap*. This is a reflexive model, in which each relationship points to the hypothesis it represents.

Figure 1 - Relationship between latent variables
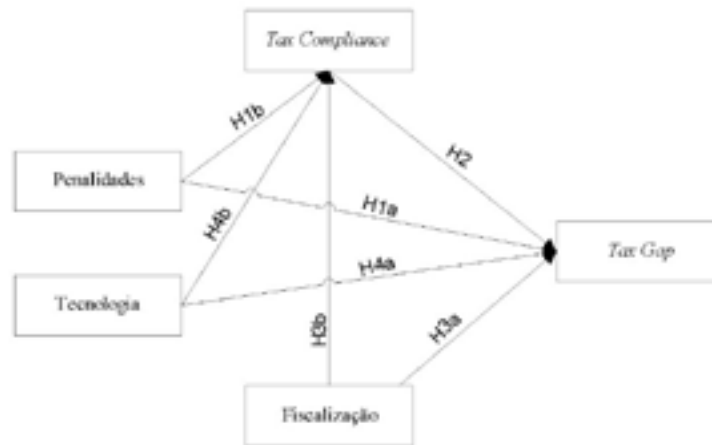
Source: prepared by the author.

3.2 Delimitation of the minimum research sample

The minimum sample size of responses required for the analyses was calculated using G*Power software (RINGLE *et al*., 2014). Given the research parameters (effect size: 0.15, significance level: 0.05, equal sample power: 0.95) and the use of four predictor variables (penalties, *tax compliance*, enforcement, and technology), the software indicated that a minimum sample of 74 cases would be necessary. Thus, the sample collected with 162 valid responses proved sufficient for the analysis, performed using the SmartPLS tool, version 3.0.

4. RESULTS AND ANALYSIS

The questionnaire was sent to accountants registered with their regional accounting councils and resent after five days from the first mailing. It was also sent via social networks (LinkedIn® and WhatsApp®) using the *snowball* method, totaling a sample of 162 valid responses.

The predominant respondent profile has a background in accounting (93%), with a postgraduate degree or specialization in accounting or taxation (72%), with more than 25 years of experience (49%), aged between 41 and 60 (65%), and working mainly in the state of São Paulo

(84%). The main sectors they represent are food, automotive, and metallurgy.

Table 1 presents the results of the descriptive statistics of the propositions.

Table 1 - Descriptive statistics

| Indicator	Strongly disagree	Disagree	Neither agree nor disagree	Agree	I completely agree	Average	Min.	Max	Median	SD
TG01	13	23	25	30	9	5.45	1	10	6	2.31
TG02	5	19	18	48	10	6.25	1	10	7	2.10
TG03	2	10	14	48	25	7.19	1	10	7	1.97
TG04	3	5	14	52	26	7.34	1	10	8	1.98
TG05	13	27	28%	25%	6	5.10	1	10	6	2.27
TG06	22	31	25	16	6	4.50	1	10	4	2.38
PN07	10	44	25	18	3	4.69	1	10	4	1.96
PN08	18	34	30	13	4	4.45	1	10	4	2.07
PN09	23	29	22	12	14	4.76	1	10	4	2.75
PN10	53	28	11	5	3	2.91	1	10	2	2.11
PN11	16	24	31	21	8	5.14	1	10	5	2.37
PN12	1	9	14	39	37	7.64	1	10	8	2.17
TC13	2	0	5	30	63	8.75	1	10	9	1.61
TC14	5	13	30	31	21	6.45	1	10	7	2.30
TC15	1	2	8	34	55	8.45	2	10	9	1.68
TC16	3	2	16	45	34	7.29	1	10	8	2.29
TC17	0	8	28	40	24	5.36	1	10	5	2.35
TC18	6	26	32	32	4	7.29	1	10	8	2.13
FM19	54	39	7	1	0	7.99	1	10	9	2.25
FM20	4	10	14	39	33	8.97	1	10	9	1.33
FM21	40	32	14	11	3	3.47	1	10	3	2.23
FM22	16	25	22	32	5	5.11	1	10	5	2.35
FM23	64	25	8	2	1	2.24	1	9	2	1.62
FM24	25	34	29	10	2	4.00	1	9	4	2.08
FM25	11	25	33	28	3	5.22	1	10	5	2.09
TEC26	11	20	33	23%	12%	5.49	1	10	5	2.37
TEC27	2	12	32	41	12	6.44	1	10	7	1.89
TEC28	2	13	48	28	9	5.97	1	10	6	1.80
TEC29	3	9	27	47	14	6.65	1	10	7	1.91
TEC30	36	35	20	8	1	3.40	1	9	3	2.06
TEC31	11	23	33	25	8	7.61	1	10	8	1.88
TEC32	3	7	16	46	28	7.10	3	10	7	1.86
TEC33	4	7	8	28	53	5.47	1	10	6	1.95

Source: survey data.

4.1 Analysis of the structural equation measurement model

To evaluate the measurement model, we followed the guidelines of Hair *et al*. (2012) so that the latent variables would reflect the observable variables and that, as the model was reflective, it would be evaluated for convergent validity, consistency reliability, and discriminant validity. The SmartPLS tool was used to perform this evaluation. Convergent validity was evaluated by the average variance extracted (AVE), considering values above 0.50 to be acceptable, which is sufficient to explain more than half of the variance of its indicators (FORNELL; LARCKER, 1981). Consistency reliability was analyzed by composite reliability, with the indication that the higher the indicator, the greater the reliability, with values between 0.7 and 0.9 being acceptable, and values above 0.6 in the case of surveys (HAIR *et al*., 2014). Based on these assumptions, the model was adjusted by extracting the indicators that did not fall within

the acceptable values, culminating in the exclusion of indicators TG02, TG03, TG05, PN09, PN11, PN12, TC16, TC17, TC18, FM21, FM, 22, FM23, FM24, TEC26, and TEC33. Thus, the adjusted structural equation model is presented in Figure 2.

Figure 2 - Structural equation model after adjustments
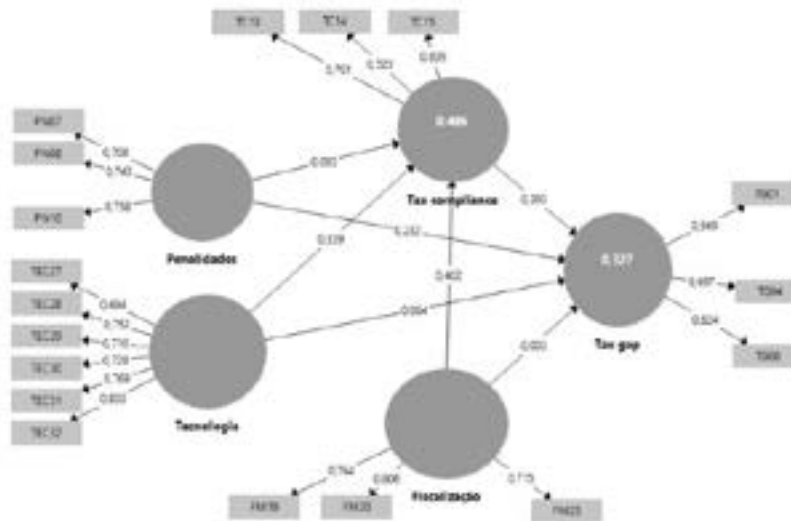
Source: research data.

The assessment of discriminant validity, used to analyze whether the latent variables of the model are independent of each other (HAIR *et al*., 2012), indicated confirmation of validity without adjustments according to the criterion of Fornell and Larcker (1981), which compares the square roots of the AVEs of the latent variables with the correlations between the latent variables, considering the criterion that the square roots must be greater than the correlations between the latent variables.

The collinearity of the model was assessed using the *Collinearity Statistic* (VIF) index, which considers values between 0.2 and 5 to be acceptable (HAIR *et al*., 2014), and no inconsistencies between the values that would compromise the model were identified.

Regarding the analysis of the structural model (*inner model*), it was possible to verify the validity of the coefficient of determination (R^2) the effect size (f^2), and the predictive relevance (Q^2). In the case of the validity of Pearson's coefficient of determination ($R^{(2)}$), used to evaluate the portion of the variance of endogenous variables that are explained by the structural model (RINGLE *et al*, 2014), values of $R^{(2)} = 2\%$ are considered a small effect, $R^2 = 13\%$ as medium, and $R^2 = 26\%$ as large (COHEN, 1999). In the proposed model, the coefficients indicated that, in the case of *tax compliance* variance, 48.6% is explained by the independent variables, and in the case of *tax gap*, 32.7%.

With regard to predictive relevance, its use is intended to analyze how closely the model

approximated its expectation (RINGLE *et al*., 2014). For the analysis of the results, the predictive relevance of the model is indicated by $Q^{(2)}$ values greater than zero for a given reflective endogenous latent variable, and if the value is equal to one, the model would be considered perfect and would reflect reality without error (HAIR *et al*., 2014). For the *Tax gap* construct, the value found was 0.127, and for the *Tax compliance* construct, it was 0.231. The effect size demonstrates how important each construct is for the model fit, considering 0.02 as a low value, 0.15 as a medium value, and 0.35 as a high value (RINGLE *et al*., 2014). The effect size values found were all acceptable (Enforcement: 0.177, Penalties: 0.109, *Tax gap*: 0.053, *Tax compliance*: 0.129, and Technology: 0.322).

Considering the adjusted model, as shown in Figure 2, and confirming its discriminant validity, *Bootstrapping* was performed in SmartPLS with a sample of 162 respondents, generating the t-test values shown in Figure 3.

Figure 3 - MEE with *Student's* t-test values
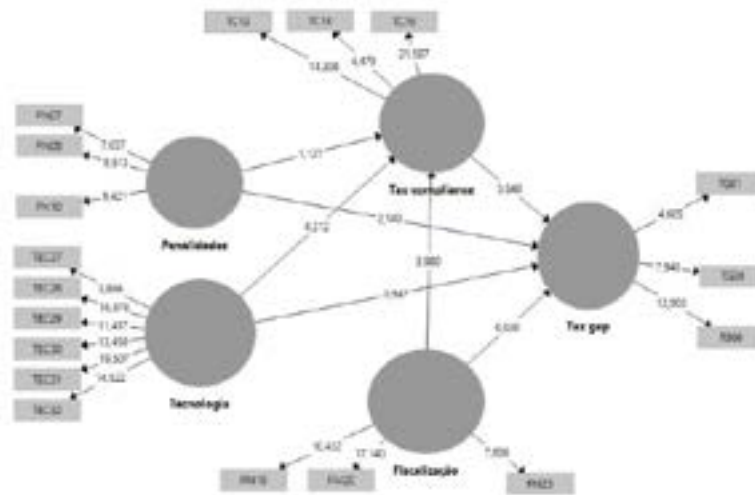
Source: research data.

The *Path Coefficients* indicate the relationships between the constructs and should be interpreted as follows: for high degrees of freedom, values above 1.96 correspond to p-values $\leq$ 0.05 (between -1.96 and +1.96 corresponds to a 95% probability and outside this range 5%, in a normal distribution) (Ringle, Silva, & Bido, 2014). Given this premise, it was found that three hypotheses were not confirmed, as shown in Table 2.

Table 2 - Evaluation of the structural model of latent variables: regression coefficient and T-statistic

Second-order variable –> first-order variable	Hypothesis	Result	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Penalties –> reduction in *tax gap*	H1a	Confirmed	0.232	0.242	0.108	2.140	0.033
Penalties => *tax compliance*	H1b	Unconfirmed	0.093	0.107	0.083	1.127	0.260
Tax compliance => reduction in the *tax gap*	H2	Confirmed	0.393	0.390	0.108	3.648	0.000
Enforcement –> reduction in *the tax gap*	H3a	Unconfirmed	-0.003	-0.002	0.096	0.030	0.976
Tax compliance	H3b	Confirmed	0.402	0.381	0.101	3,980	0.000
Technology => reduction in the *tax gap*	H4a	Unconfirmed	0.064	0.068	0.080	0.547	0.585
Technology –> *tax compliance*	H4b	Confirmed	0.339	0.361	0.080	4.212	0.000

Source: survey data.

5. FINAL CONSIDERATIONS

This study aimed to assess, from the taxpayers' perspective, whether the fiscal monitoring resulting from SPED had an impact on the *tax gap* in Brazil. To achieve this, PLS modeling was used, a specific methodology for quantifying latent variables, extracted from the main determinants of the *tax gap* identified in the literature review. From this, hypotheses were developed that broadly covered the possibilities that the determinants of the *tax gap* have in influencing it, directly or indirectly.

The results of the descriptive statistical analysis provided important insights into the determinants, but it is necessary to highlight the responses with the lowest and highest levels of conviction among taxpayers. The responses with the lowest conviction are largely related to taxpayer behavior, a topic that, due to its high complexity and excess of variables, is still in its infancy in the literature, requiring further study in various fields, including psychology. With regard to the responses with the highest conviction, technology stands out, as demonstrated in response to several propositions on the topic, some of which obtained agreement from more than 90% of respondents, such as those concerning improving the efficiency of tax administration, access to more taxpayer information, and greater monitoring capacity.

With regard to the hypotheses developed, it was found that penalties did in fact influence the reduction of the *tax gap*, as indicated in the seminal work by Alligham and Sandmo (1972). This means that taxpayers assess the size of the penalty to be applied in cases where they con-

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sider evasion, which can influence both the decision to evade and the amount to be evaded. However, the same effect was not confirmed when analyzing the impact of penalties on *tax compliance*. This result indicates that, in the perception of taxpayers, penalties are linked to the need for the tax authority to discover non-*compliance*, which occurs through audits (MORSE, 2009). If taxpayers do not believe in the efficiency or probability of an audit, there is a tendency for *tax compliance* to decrease among those who are prone to such omissions. The results of these hypotheses indicate that the Brazilian tax model can be classified as useless in Doran's (2009) classification, as it has a system of penalties that promotes taxpayer behavior that does not result in *compliance*.

In the case of *tax compliance*, as discussed in the study, there is a close relationship with the reduction of the *tax gap*, and in many cases their definitions are confused (FISCA-LIS, 2016). This relationship was represented by the hypothesis that analyzes the effects of *tax compliance* on the reduction of the *tax gap*, a hypothesis confirmed by taxpayers' perceptions. This confirmation broadly reflects the position available in the literature that increasing the information available to tax authorities, whether through their own returns or those of third parties, is effective in reducing the *tax gap*. This result, which appears to coincide with the very objective of the study, corroborates the importance of developing public policies to promote *tax compliance*, which involves simplifying legislation and ancillary obligations and encouraging taxpayers to comply with tax regulations.

As for audits, their effects on reducing the *tax gap* were not confirmed by taxpayers, contrary to the prevailing position of the doctrine, which is based on the work of Allingham and Sandmo (1972), which mentions penalties and audits as the main elements in reducing tax evasion. This can be explained by the fact that, in certain cases, the increased likelihood of audits does not inhibit tax evasion when it is possible to compensate for increased monitoring of income by reporting income from less monitored sources (JOHNSON *et al*. (2010). In addition, the relationship between enforcement and tax evasion results in increased *compliance* until a certain level of enforcement is reached, decreasing after that level (MENDOZA *et al*., 2017 apud LEDERMAN, 2018).

On the other hand, the hypothesis that enforcement increases *tax compliance* was confirmed, corroborating the position of Telle (2013), who states that the existence of enforcement positively affects *tax compliance*, as well as increasing the expected future punishment and the expectation of detection. This is also the position of Becker (1968), who cites the increased frequency of audits as one of the factors increasing the probability of detection, which encourages

increased *compliance*.

Finally, the Technology construct was the one that obtained responses to the propositions with the highest agreement from taxpayers in the descriptive statistical analysis. However, when analyzing the effects of this determinant on reducing the *tax gap*, the result of this significance was not confirmed. This result diverges from the prevailing literature, which suggests that increased technology allows for greater monitoring, in some cases perfect monitoring, which suggests a reduction in tax evasion (JOHNSON *et al*., 2010), and it is also possible to use algorithms to analyze the coevolution of tax schemes (Hemberg *et al*., 2016) and monitor electronic payments (IMMORDINO; RUSSO, 2018), also aimed at combating tax evasion.

With regard to the effects of technology on increasing *tax compliance*, the result was statistically significant. This indicates that the technology was effective in enabling tax authorities to access more information, whether their own or from third parties. Information that was not complete, accurate, and timely was affected by technology, increasing the flow of available information and improving tax collection capacity with the possibility of tracking and analyzing transactions that leave electronic traces (ALM, 2021). In addition, empirical evidence reinforces that electronic returns allow for cross-checking of information, which increases *compliance* (ALM; SOLED, 2017).

Given these results, it can be inferred that tax monitoring has impacted the main determinants of the *tax gap* in different ways, indicating that there has been, and thus, the main contribution of this study was to indicate that tax monitoring is an important tool for reducing the *tax gap*, but that knowledge of certain gaps still needs to be deepened, such as the influence of taxpayer behavior on the determinants of the *tax gap*, because, as observed, the responses with less conviction are related to this behavior, a subject that still requires in-depth studies in the literature.

The use of determinants also contributes significantly, as from the taxpayers' perspective, it allows the identification of the most sensitive procedures, i.e., those that, regardless of the fact that they pose a greater real risk to the taxpayer, cause them to behave in a compliant manner due to a false perception of risk, resulting in less evasion. Once identified, such procedures should be explored in the development of public policies, already aware of the expected response from taxpayers.

Finally, it is suggested that, for future research, the determinants be tested individually in order to detect the psychological, social, economic, or moral factors that lead taxpayers to engage in evasive behavior. Cultural issues may also be involved, as well as different perceptions of risk and dissatisfaction with governments. It is also recommended that opportunities for evasion be analyzed considering the form of taxation, the tax burden, and tax incentives for taxpayers.

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