

# Relationship between the perception of corruption and tax evasion in Latin America

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## Abstract

**Objective:** The research aimed to verify the implication of the level of perception of corruption, in the public sector, in tax evasion of taxes on company income in Latin American countries.

**Method:** With data from 10 Latin American countries, between 2011 and 2017, in a sample of 771 companies and 5006 observations, initially, in the study, the tax evasion proxy was estimated, through the book tax difference abnormal, as a result of the residue of a regressive model that considered the variables that would explain, on average, the difference between tax and accounting income. Then, the BTDA was regressed with the variables of corruption perception of the tax rate on profit required in the country.

**Results:** The results found indicate that society's perception of corruption in the public sector can stimulate tax evasion in companies in the face of the feeling of abandonment and social neglect and that high tax rates on profit discourage tax evasion due to the possibility of companies receiving high fines for non-payment of taxes.

**Contributions:** The research advances the debate on government corruption and its influence on the behavior of managers in companies, finding evidence of a direct relationship between the perception of corruption in the public sector and tax evasion in publicly traded companies in Latin American countries. These findings contribute to the understanding of the determining reasons for tax evasion practices in companies, providing explanations that clarify in a practical way how corruption in the public sector can influence the private sector.

**Keywords:** Latin America; Aversion to taxes; Behavior; Corruption; Tax evasion.

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## Contextualization

The principle of action and reaction, formulated by Newton (1687), establishes that for every action there is always a reaction of the same magnitude in the opposite direction. Social behavior is not disconnected from this system. An individual who feels cheated will take steps to not feel cheated again. Thus, corruption can cause in people the same perception suggested by a broken window in an abandoned building: a feeling of disorder and impunity that generates unreasonable reactions in the decision-making process of those who feel robbed.

The studies by Kahneman and Tversky (1979), related to emotional factors that drive economic decisions, pointed out that the pain of loss is greater than the attachment to gains. Therefore, in a scenario of corruption, where citizens and companies pay taxes, but realize that the fruit of their efforts is being diverted to dirty, unfair and disreputable purposes, it is to be expected that taxpayers will adopt extreme measures to avoid the payment of taxes. For this reason, the perception of corruption can serve as a stimulus to tax evasion.

Both tax evasion and corruption are reprehensible behaviors that threaten society by reducing the State's ability to offer quality goods and services. Tax evasion does not allow the inflow of resources, while corruption withdraws them from the public purse. These are crimes that prevent the Public Power from carrying out its functions, due to financial insufficiency, generating serious social problems due to the precarious provision of assistance in the sphere of education, health, security and other public policies (Cruz, Paiva, da Cunha & Neto, 2019).

Corruption is conceptualized, in the sphere of human behavior, as a moral or social deviation, where the agent is motivated to perform some conduct that goes against the rules considered fair and moral by society, in favor of self-benefit (Araújo, Soeiro, Matos & Bautista, 2020). Generally, the concept of corruption is associated with Public Administration, through the diversion of public funds, use of public goods for private gain, bribery, influence peddling, fraud and others (Leal & de Moraes, 2018). However, corruption can also contaminate the private sector, due to the feeling of impunity nurtured in private managers, in the face of improprieties in the public sector (Silva, Braga & Laurencel, 2009).

Ackerman (1978) explained that the impact of corruption on organizations and the economy is profoundly accentuated, generating several problems that are difficult to measure. However, a well-known parameter for measuring corruption is the Transparency International Public Sector Corruption Perceptions Index, which derives from a compilation of other indicators derived from the opinions of people linked to transnational corporations about the level of corruption that they imagine exists in a

given country (Abramo, 2005).

On the other hand, the literature discusses the aversion to taxes by economic agents, revealing that people do not honor the payment of taxes with satisfaction, given that the tax, as a tax species, is a compulsory cash benefit without any immediate or direct counterpart. (Kallbekken, Kroll, & Cherry, 2011; Engström, Nordblom, Ohlsson, & Persson, 2015). At this point, corruption can exacerbate the aversion to taxes, as people feel that the resources collected from the public coffers serve to fuel acts of corruption.

With this view of apparent disorder generated by the perception of corruption, taxpayers can seek bolder mechanisms to avoid paying taxes. These mechanisms may possibly go beyond legality, required in tax avoidance, to the illegality typified by tax evasion (Cross & Shaw, 1982; Hayashi, Nakamura, & Gamage, 2013).

In view of this, just like a broken window, which gives rise to the impression of abandonment and disorder in the social sphere, corruption can be the ignition trigger for immoral and opportunistic conduct, such as tax evasion. Thus, this research aims to answer the following question: What is the implication of the level of perception of corruption, in the public sector, in tax evasion of taxes on income, by publicly traded companies in Latin American countries?

The purpose of this research is to investigate the association between the perception of corruption and tax evasion of taxes on income by publicly traded companies in Latin American countries. At this point, one cannot confuse tax avoidance, a lawful conduct that amounts to a legal reduction of the tax burden, with tax evasion, an unlawful conduct that amounts to a crime of tax evasion. Although the measurement of tax evasion is an arduous task (perhaps impossible), based exclusively on the available accounting data, despite this limitation has been circumvented in the literature with alternatives of proxies for tax evasion, as in the studies by Desai & Dhamapala (2006), Frank, Luch & Rego (2009), Tang (2006), Tang & Firth (2011) and Santos (2016), most of them using variants of the abnormal portion of total tax adjustments, using the same system as the models to capture discretionary accruals.

The focus of the study in Latin American countries was due to the similarity between them, as they have a similar historical process of formation, through colonization, and are notoriously important for the world economy. The Latin American countries that make up the sample are developing countries with singular cultural convergence and high distrust of the population, due to poor economic performance, corruption scandals and the instrumental use of political institutions by the rulers of the new democracies in that region (Power & Jamison, 2005).

As a theoretical contribution of the research, it is possible to highlight the associations of the theories of the prospect, the broken windows and the shattered testicles, to reveal how corruption in the public sector can influence business decisions, especially in Latin American countries, in which the research reveals that the perception of corruption in the public sector is reflected in the tax evasion perpetrated in companies. These indications instigate research on the subject and the search for an understanding of the theoretical, practical, political and social developments of the ethical conduct of public managers and their repercussions on the private sector, making the deepening of the theme relevant for public administration, the market, shareholders and other stakeholders of companies operating in emerging markets in developing countries, such as Latin America.

In this way, the research sought to expand the limits of studies related to organizational behavior, linked to tax management, to bring out more accurate explanations about the corporate environment in developing countries, given the perception of corruption in the public sector, opening the way for new research. related to the topic and offering perspectives of new frontiers for exploring the determining reasons for the adoption of accounting choices with a tax scope, whether legal or not.

## Plataforma Teórica

The broken windows theory is based on the ideas of James Wilson and George Kelling propagated in the article "Broken Windows", published in 1982 in *The Atlantic Monthly* magazine. In the article, the authors reported a psychosocial experiment conducted by Philip Zimbardo in 1969 at Stanford University in the United States of America (Rubin, 2003).

In the experiment, two vehicles without license plates and identical brand, model and color were abandoned. One vehicle was abandoned in the Bronx, known as a poor and troubled part of New York, and another in Palo Alto, a wealthy and quiet part of California. The result initially found was that in the Bronx, after 10 minutes, the car began to be vandalized. The first people to reach it removed the radiator and battery. After 24 hours, soon, the vehicle was completely plucked and what could not be used served as a playground for children. In Palo Alto, the abandoned vehicle remained intact for more than a week. At first glance, it seemed that the crime problem was linked to social and economic problems, however, Zimbardo broke one of the windows of the abandoned vehicle in Palo Alto. As a result, within a few hours, the vehicle that was intact was totally vandalized, as it had been in the Bronx, by people who, socially, seemed successful (Wilson & Kelling, 1982).

Kelling and Coles (1997) continued the studies along these

lines by publishing the criminology book entitled "Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities". The objective was to explain strategic ways of combating urban crime, so that the solution found would be to fight petty crimes to prevent larger ones. Thus, they presented as an example a building where once some windows were broken and not repaired quickly vandals would rise to break more windows and, after some time, these same vandals could occupy the building because they thought it was abandoned. Another example would be garbage accumulating on sidewalks: over time, more garbage would accumulate, as people would find it normal to deposit garbage on sidewalks (Kelling & Coles, 1997).

Therefore, minor crimes, if tolerated by society, could create opportunities for larger crimes. If criminals who commit petty crimes are not immediately punished, they influence those who are prone to commit crimes of greater offensive potential, as they feel safe to act in a region that does not have strong control and supervision (Kelling & Coles, 1997). In short, in order to prevail over disorder, all troublemakers must be fought, so that crime disappears (Coutinho & Carvalho, 2003).

The meaning constructed by the Theory of Broken Windows evolved from the Breaking Balls Theory, or Theory of Shattered Testicles. This theory originated from police experience based on the premise that those responsible for minor crimes, when pursued austerely, will give up or flee to other locations if they want to persist in crime. In view of this, the theory of shattered testicles gave rise to the development of the theory of broken windows on the grounds that, if minor crimes are not fought (repaired windows), they will soon evolve into major crimes (Strasser & Santos, 2015).

The association between these theories gave rise to the institution of the Zero Tolerance policy in New York, in 1994, by the mayor Rudolph Giuliani, elected with the platform of "hardening" against criminals through a war on crime. Policing under the zero-tolerance policy began to repress all types of disorder, even when it was not, legally, a crime. As a result, New York City began to propagate drops in crime rates of around 70.6% between 1991 and 1998 (Shecaira, 2009).

In spite of the criticism that falls on the policies based on the theories of broken windows and shattered testicles, on the grounds that they only procrastinate the social problems that foment crime, expelling criminals from places without it modifying the cultural, social and economic reality that runs as determining factor for committing crimes, it is worth mentioning that, in fact, greater inspections and punishments lead the individual to analyze the risks and benefits of crime (Coutinho & Carvalho, 2003; Strasser & Santos, 2015). ). According to the Theory of the Simple Method of Rational Crime, between the dilemma of going

beyond the limits of the law and the expected utility, to be obtained by socially reprehensible conduct, rationality weighs risk and benefit. Here, corruption can present itself as a factor in reducing risk perception and maximizing benefits (Becker, 1999; Mazar, Amir & Ariely, 2008).

In this itinerary, the perception of corruption in the public sector can serve as a stimulus to criminal practices in companies, such as tax evasion, due to the feeling of impunity generated by it. This may occur mainly because the money diverted by corruption is derived, for the most part, from taxes paid by taxpayers, which include companies, causing a feeling of loss for managers, since taxes that were paid will not be reversed in favor of society (Cross & Shaw, 1982; Abramo, 2005; Da Silva Filho, Cavalcante, Bomfim, & Leite Filho, 2018).

Prospect or perspective theory clarifies that the negative feeling experienced by the loss is greater than the positive feeling of the gain, explaining that the comparison between loss and gain is not linear. It so happens that the utility of the gain of  $x$  does not have, emotionally, the same lack of utility of the loss of the same  $x$ . This explains the main flaws in the economic analysis of the expected utility, for not considering the distinction between losses and gains (Kahneman & Tversky, 1979). Thus, prospect theory elucidates the isolation effect in which individuals generally abandon all the risks involved in decisions and simply focus their respective analyses on the components that distinguish them from the options.

Taking into account that taxes are paid by taxpayers to be reverted to society through public goods and services, such as education, health, security, infrastructure and others, it is to be expected that the diversion of public resources due to corruption will be perceived by taxpayers as a loss, as those resources will no longer be reverted to the population, where they are included. This sense of loss can be associated with people's innate aversion to taxes, enhancing the motivation to practice tax evasion (Cross & Shaw, 1982; Engström et al., 2015).

Taxes are of paramount importance for maintaining the structure of countries and carrying out their social activities. Nevertheless, even though people benefit from the goods and services offered by the government, they do not like to pay taxes (Sussman & Olivola, 2011). Tax aversion may be associated with the pain experienced by people in paying any expense (Meyvis, Bennett, & Oppenheimer, 2010). Likewise, aversion to taxes can stem from cultural, political or moral reasons (Kirchler, 1998; Hardisty, Johnson, & Weber, 2010). Thus, taking into account the political, cultural and social conjuncture in which the individual of each country is inserted, corruption can be the driving force for the practice of tax evasion.

In Latin America it is possible to identify a cultural, economic, social and political unit, capable of allowing the

measurement of the effects of corruption on tax evasion. The region has a total area of 21,069,501 km<sup>2</sup>, stretching from Rio Grande (border of Mexico and the United States of America) to Tierra del Fuego (a set of islands in the extreme south of America), encompassing a total of 20 countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Honduras Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Uruguay and Venezuela. The official languages of Latin American countries are Spanish, Portuguese and French, all derived from Romance languages (Latin), a legacy of the European countries that colonized the region. These characteristics unite the region, not only for political-territorial reasons, but also for cultural reasons (Skidmore & Smith, 2005).

The entire region underwent a process of colonization, from which, when disengaged, similar habits were assimilated with origins in the religious and cultural bases of the former colonizers. As a result, there is a convergent cultural identity in the Region, composed of developing countries, with problems arising from the low economic performance of the new democracies, caused by populist public policies adopted by local governments, marked by corruption scandals and the reckless use of public institutions (Power & Jamison, 2005).

As for measuring the tax behavior of companies, this is not a simple task (Santos, 2016). There are several possibilities for managing income taxes that are usually associated with accounting choices and their consequences that arise from the temporal differences between the cash basis and the accrual basis (Martinez, 2017).

Despite the different positions in the literature on tax management, the greatest concern regarding its definition is in delimiting whether or not its performance is associated with legality (Lietz, 2013). From the perspective of simple tax planning, Hanlon & Heitzman (2010) point out that the literature has understood that there is attention to legal limits, using legally permitted accounting and management choices to obtain a result that leads to reduced taxes.

On the opposite side, transcending legal limits, there is tax evasion, where the use of fraud and other cunning means to reduce or evade the incidence of taxes may occur (Rego, 2003). For the measurement of tax evasion, although segregation limitations persist on the part of the legality of available accounting choices, the literature has offered proxies for tax evasion (Desai & Dhamapala, 2006; Frank, Luch & Rego, 2009; Tang & Firth, 2011; Santos, 2016).

Nevertheless, without detracting from the importance of the other metrics mentioned in the literature, the present study used the book tax difference abnormal (BTDA), according to research by Tang (2006); Tang & Firth

(2011) and Santos (2016), for reputing to be the most appropriate to analyze the level of tax evasion related to taxes levied on corporate profits, since BTDA is the unexplained portion of the gap between accounting profit and tax for the factors that would normally justify this difference by legally available accounting choices.

Thus, the social disorder and sense of impunity caused by corruption combined with the taxpayers' feeling of loss (caused by the perception that the fruits of their efforts materialized in taxes are diverted to the benefit of others) and the aversion to taxes, intrinsic to human nature, may be able to encourage the practice of tax evasion in Latin American companies. Thus, based on the theory of broken windows, the following research hypothesis is established:

**(H1) the perception of corruption in the public sector has a positive relationship with tax evasion in publicly traded companies in Latin America.**

## Methodology

### Sample Selection and Data Collection

The survey covered publicly traded companies in Latin America. The countries used to compose the sample were: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru and Venezuela. Companies in the financial and insurance sector were excluded from the sample, due to the special regulation to which they are subject and due to the peculiarity of their capital structure. Financial and insurance companies are highly leveraged, so their peculiar capital structure could bias data analysis.

The financial statements of the companies, between the years 2010 and 2017, were extracted from the Thomson Reuters Eikon® database, using the dollar as the reference currency. The reference years used were from 2011 to 2017, and data from the year 2010 were used to calculate variations and weights related to the year 2011.

The time cut fell in 2010 because between 2008 and 2009 there was an international financial crisis triggered by the bankruptcy of the American bank Lehman Brothers, generating a ripple effect in other financial institutions that failed, in a process known as the "subprime crisis" (Feldkircher, 2014). The global financial crisis in that period may have affected the results reported by Latin American companies, and it is possible that this event interfered in the difference between the accounting and tax income in those companies, due to the losses, thus modifying the evasion tax.

Information on the rate of taxes levied on income by country and year was obtained from the Trading Economics website. Public sector corruption perceptions by country and year were collected on the Transparency

International website.

### Econometric Procedures

Income taxes are based on the company's profit. It is the accounting choices adopted by management that will reflect the difference between accounting profit and tax profit. In this understanding, based on studies on earnings management, where choices can be discretionary (opportunistic), the literature presents as a proxy for tax evasion the unexplained portion (BTDA) by the factors that would give rise to the difference between accounting income and taxable income (BTD). The BTDA is the evasion tax, that is, the part of bold tax management, which could have descended into illegality (Allingham & Sandmo, 1972; Frank, Lynch, & Rego, 2009; Formigoni, Antunes, & Paulo, 2009; Fukofuka, 2013; Tang & Firth, 2011; Santos, 2016).

Based on this and on the studies by Tang & Firth (2011) and Santos (2016), the abnormal tax adjustments related to income (BTDA), considered a tax evasion proxy, was obtained by the regression error estimated in Equation 1.

$$\frac{BTD_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{\Delta R_{it}}{A_{it-1}} + \alpha_2 \frac{Imob_{it}}{A_{it-1}} + \alpha_3 PFiscal_{it-1} + \alpha_4 End_{it} + \alpha_5 \sum_{ano} dummy\_ano + \alpha_6 \sum_{pais} dummy\_pais + \epsilon_{it}$$

Where the variables used were:

- $BTD_{it}$ : Difference between the company's tax and accounting income  $i$  in period  $t$ ;
- $A_{it-1}$ : Total assets of company  $i$  in period  $t-1$ ;
- $\Delta R_{it}$ : Change in net income of company  $i$  in period  $t$ ;
- $Imob_{it}$ : Fixed assets of company  $i$  in period  $t$ ;
- $PFiscal_{it-1}$ : Dummy variable where 1 was assigned when the company  $i$  in period  $t-1$  presented a Profit before Income Taxation (LAIR) lower than 0, being assigned 0 for the other cases;
- $End_{it}$ : Degree of indebtedness, calculated by dividing debt capital over assets, of company  $i$  in period  $t$ ;
- $\sum dummy\_ano$ : Dummies variables that assume 1 if the observation is the year to which it refers and 0 otherwise;
- $\sum dummy\_pais$ : Dummies variables that assume 1 if the observation is the country to which it refers and 0 otherwise;
- $\alpha_{0, \dots, 6}$ : Estimated parameters;
- $\epsilon$ : Model error term.

The BTD variable was calculated according to Equation 2 (Desai & Dharmapala, 2009; Martinez, Francisco Filho, & Anunciação, 2013; Júnior Brunozi,



Kronbauer, Martinez, & Alves, 2018).

$$BTD_{it} = LAIR_{it} - \frac{(Taxes\ paid\ arising\ from\ Profit_{it})}{TXIR_{pt}} \quad (2)$$

It is worth clarifying that in the BTDA calculation, LAIR is the profit before taxes on the income of company *i* in period *t*, the taxes paid resulting from the profit were obtained in the income statement for the year and the TXIR is the tax percentage charged in country *p* in period *t*. If the LAIR is less than or equal to 1, and the taxes paid resulting from the income are equal to 0, the BTDA was equal to 0. In this system, the BTDA presents the temporary and permanent differences between the accounting income and the taxable income (Santos, 2016; Júnior Brunozi et al., 2018).

The variation in net revenue ( $\Delta R$ ) aims to capture the effects of the economic circumstances, in which the companies are inserted, on the BTDA variations and that do not result from tax evasion. Fixed assets (Imob) were used due to their influence on the difference between accounting and tax profits resulting from depreciation. On the other hand, the tax loss in the previous year (PFiscal) can be used by companies as compensation, in the subsequent period, in the payment of taxes levied on income, due to the authorization of some legislation, changing the BTDA and interfering with its accuracy to capture the tax evasion. Indebtedness (End) was used because more indebted companies tend to pay more interest, and it is possible that they deduct from the accounting result to form the calculation basis for taxes on income (Allingham & Sandmo, 1972; Titman & Wessels, 1988; Tang, 2006; Fukufuka, 2013; Martinez et al., 2013; Santos, 2016; Júnior Brunozi et al., 2018).

Taking into account that each country will have peculiarities in the tax legislation related to taxes on income, as well as each sector may have specific tax incentives, we sought to control these special conditions through dummy variables of sector and country in the estimated econometric model.

After obtaining the variable BTDA, captured by the residuals of the estimated regression, according to Equation 1. This variable was used in absolute value in Equation 3, due to the positive or negative differences being the consequences of a possible tax evasion. Therefore, here, the premise is assumed that the financial statements are free from errors and, consequently, negative differences could be derived from the strategic reduction of the tax and positive ones could result from tax collections from previous years due to penalties, inspections and infraction notices drawn up in the subsequent period. Thus, the modular distancing of the discretionary portion found from the difference between accounting and tax income was used as a proxy for tax evasion.

Thus, Equation 3 was used to estimate the influence of the perception of corruption, in the public sector, on tax evasion perpetrated by companies.

$$BTDA_{it} = \alpha_0 + \alpha_1 Corrup_{pt} + \alpha_2 TXIR_{pt} + \alpha_3 Tam_{it} + \alpha_4 ROA_{it} + \alpha_5 G_{it} + \varepsilon_{it} \quad (3)$$

Where the variables used were:

- $BTDA_{it}$ : Proxy for tax evasion of company *i* in period *t*;
- $Corrup_{pt}$ : Public sector corruption perception index, calculated by the difference between 100 points and the perception index released by Transparency International, in country *p* in period *t*, dividing the result by 100, so that the understanding of the corruption perception index is analyzed on a scale from zero (highly integrity) to 1 (highly corrupt);
- $TXIR_{pt}$ : Tax percentage on profits required by country *p* in period *t*;
- $Tam_{it}$ : Company size, calculated by the natural logarithm of the equity of company *i* in period *t*;
- $ROA_{it}$ : Return on assets of company *i* in period *t*;
- $G_{it}$ : Growth, calculated by the change in assets of company *i* in period *t* in relation to period *t*-1;
- $\alpha_{0...n}$ : Estimated parameters;
- $\varepsilon$ : Model error term.

The Corruption Perceptions Index (IPC) released by Transparency International measures levels of perceptions in the public sector worldwide, using a scale from zero (highly corrupt) to 100 (highly honest). According to the system adopted in the CPI, the higher the index, the lower the degree of corruption.

Thus, in order to simplify the understanding of the analysis of the results, in this research, the index was adopted inversely, on a reduced scale: zero (highly integrity) to 1 (highly corrupt). For that, the corruption perception index variable (Corrup) was calculated by the difference between 100 points and the perception index published by Transparency International, in country *p* in period *t*, dividing the result by 100. It is expected, by the Theory of Broken Windows, that the Corrup variable has a positive (direct) relationship with the BTDA variable.

The required tax percentage on profits (TXIR) variable is necessary to control the effects of the tax reality of each country and by period, in the sense that higher tax rates are accompanied by proportionally high fines, due to the penalty for its default being based on the percentage adopted by TXIR. Therefore, taking into account the

Theory of Shattered Testicles, it is expected that the TXIR variable presents a negative (inverse) relationship with the BTDA variable (Strasser & Santos, 2015).

For the study, we sought to control the effects of company size (TAM), because larger companies tend to have more effective internal control, better corporate governance practices and better fraud prevention measures, contributing, indirectly, to the reduction of tax evasion (Desai & Dharmapala, 2009; Santos, 2016).

Likewise, higher returns on assets (ROA) in companies discourages the use of management, and consequently tax evasion, to achieve profitability goals (DeAngelo & Masulis, 1980; Fukufuka, 2013).

On the other hand, growth (G) may have an impact on tax evasion, due to investments made and tax incentives resulting from financial investments (Allingham & Sandmo, 1972; Han & Kung, 2015; Frank et al., 2009).

Table 1 – Expected relationship between the BTDA variable and the independent variables

Variable	Expected relationship	Theoretical Basis
Corrup	+	(Kahneman & Tversky, 1979; Cross & Shaw, 1982; Wilson & Kelling, 1982; Kelling & Coles, 1997; Hardisty, Johnson, & Weber, 2010; Sussman & Olivola, 2011; Engström, Nordblom, Ohlsson, & Persson, 2015)
TXIR	-	(Coutinho & Carvalho, 2003; Strasser & Santos, 2015)
Tam	-	(Desai & Dharmapala, 2009; Santos, 2016)
ROA	-	(DeAngelo & Masulis, 1980; Fukufuka, 2013)
G	+/-	(Allingham & Sandmo, 1972; Han & Kung, 2015; Frank et al., 2009).

Source: prepared by the authors.

The data used in the research were worked on in an unbalanced panel, aiming to maximize the number of observations, referring to the years 2011 to 2017. The main panel data techniques were used to verify the most appropriate model for data treatment, between the unconstrained pooled model, the constrained fixed effects model and the constrained random effects model.

Thus, several procedures were carried out in the course of the research to determine the most appropriate one, using the Chow, Hausman and Breusch-Pagan tests. Wooldridge and modified Wald tests for panel data were also applied to observe, respectively, the autocorrelation and heteroscedasticity of the data (Fávero, 2013).

All econometric models were robustly estimated, using the Ordinary Least Squares (OLS) technique. As limitations, this method starts from the sample mean and does not solve possible exogeneities, endogeneity and heterogeneity not observed in the variables used in the study.

## Results

The study sample consisted of 771 publicly traded companies, excluding those in the financial and insurance sectors, in 10 Latin American countries, which had the necessary data to calculate the variables of interest to the research, in the period from 2011 to 2017. The sample is distributed in 9 economic sectors, using the Thomson Reuters Eikon® classification, with a heterogeneous distance between the average effective tax burden and the tax burden required by law.

Table 2 depicts the quantitative composition of the sample and the descriptive statistics of the accounting variables calculated for the companies in the sample, after the treatment of atypical observations (outline) by winsorization, at the level of 0.5%.

Table 2 - Descriptive statistics of the sample companies, period from 2011 to 2017

All companies in the sample					
Variables	Average	Median	Standard Deviation	Minimum	Maximum
BTD	0,0963	0,0794	0,3539	-13,9382	8,8358
ΔR	0,2889	-0,0053	0,6159	-3,0468	22,1519
IMOB	0,4649	0,3221	0,6066	0	11,9312
END	0,5134	0,5203	0,2125	-0,0607	0,9999
TAM	19,1049	19,2044	2,0076	3,8885	25,9429
ROA	0,0565	0,0497	0,1267	-2,2650	1,9462
G	0,0317	-0,0089	0,5131	-0,9994	13,0236
Companies	771				
Observations	5006				

Source: prepared by the authors.

It can be seen from Table 2 that the average gap between Accounting and Tax Income (BTD) in the sample observations was 9.63%. Debt (END) was 51.34%, return on assets (ROA) 5.65% and company growth was 3.17%.

Tabela 3 – Estimação da regressão da Equação 1 com todas as empresas.

Variable	Coefficient (p-value)	VIF	Coefficient (p-value)	VIF	Coefficient (p-value)	VIF
Constant	0,2279 (0,000)	-	0,2099 (0,000)	-	0,2073 (0,000)	-
ΔR	0,0436 (0,288)	1,09	0,0460 (0,265)	1,11	0,0458 (0,272)	1,12
IMOB	-0,0454 (0,489)	1,09	-0,0524 (0,448)	1,18	-0,0553 (0,438)	1,21
PFISCAL	-0,1882 (0,000)	1,04	-0,1862 (0,000)	1,05	-0,1846 (0,000)	1,05
END	-0,1315 (0,000)	1,04	-0,1297 (0,000)	1,18	-0,1255 (0,000)	1,12
Year dummy	Não		Sim		Sim	
Country dummy	Não		Não		Sim	
R <sup>2</sup>	0,0707		0,0778		0,0793	
R <sup>2</sup> adjusted	0,0699		0,0754		0,0758	
F statistic	61,68 (0,000)		36,92 (0,000)		31,89 (0,000)	
Observations no.	5006		5006		5006	

Source: prepared by the authors.

As for the Public Sector Corruption Perceptions Index (CPI), Figure 1 presents the score found by the non-governmental organization Transparency International. According to Figure 1, excluding Canada and the United States, which are not part of Latin America, the three countries that are best positioned in 2017 in terms of the perception of corruption index in the sense of

Transparency International are Uruguay, Barbados and Chile. The countries that obtained the worst positions were Venezuela, Haiti and Nicaragua.

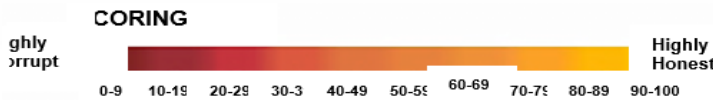
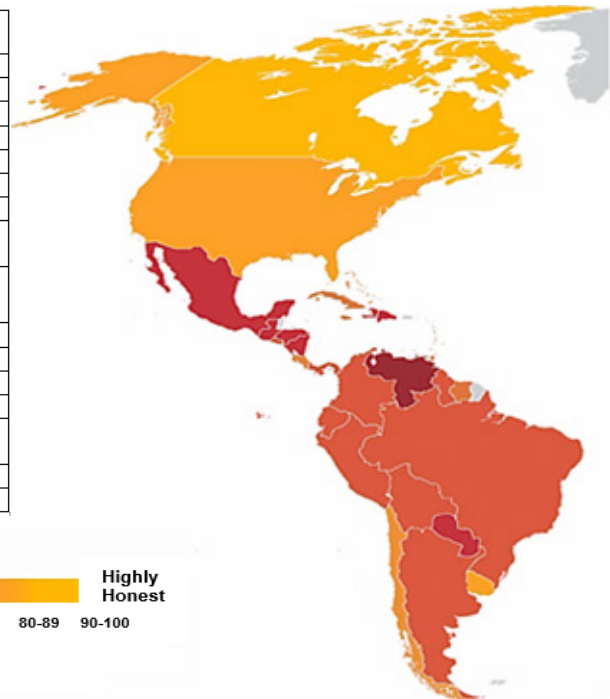
Still in Figure 1, regarding the countries that make up the sample, during 2017 Chile (67) was the country that obtained the best score in the corruption perception index, followed by Costa Rica (59) and Argentina (39). The country in the sample that obtained the worst score regarding the perception of corruption was Venezuela (18), followed by Mexico (29) and Ecuador (32). Brazil, Colombia and Peru scored the same (37), followed by Bolivia (33) which scored low in the perception of corruption in the public sector.

The Corruption Perception Index (CPI) released by Transparency International, shown in Figure 1, uses a scale from zero (highly corrupt) to 100 (highly honest). In this research, the index is adopted inversely, on a reduced scale, so that the corruption index adopts the following meaning: zero (highly honest) to 1 (highly corrupt).

Then, the tax evasion rate was estimated by the residuals of Equation 1, obtaining the BTDA, used as a proxy for tax evasion. Table 3 presents the results of the estimations of Equation 1 with the sample data.

Figure 1 – Corruption Perceptions Index score in 2017 for countries on the American continent and the position of each country in relation to the rest of the world, as released by Transparency International.

Position	Country/Territory	Score
8	Canada	82
16	The USA	75
23	Uruguay	70
25	Barbados	68
26	Chile	67
28	Bahamas	65
38	Costa Rica	59
40	Saint Vincent and the Grenadines	58
42	Dominica	57
48	Saint Lucia	55
52	Granada	52
62	Cuba	47
68	Jamaica	44
77	Suriname	41
77	Trinidad and Tobago	41
85	Argentina	39
91	Guiana	38
96	Brazil	37
96	Colombia	37
96	Panama	37
96	Peru	37
112	Bolivia	33
112	El Salvador	33
117	Ecuador	32
135	Dominican Republic	29
135	Honduras	29
135	Mexico	29
135	Paraguay	29
143	Guatemala	28
151	Nicaragua	26
157	Haiti	22
169	Venezuela	18



Source: image extracted and modified from the 2017 Transparency International report posted at <http://www.transparency.org/cpi>. ISBN 978-3-96076-084-9.



Table 3 contains the estimation results of the model shown in Equation 1, segregated according to year and country dummies. The Change in Net Revenue ( $\Delta R$ ) and Fixed Assets (IMOB) did not show significant relationships in any of the models. The dummy variable for tax loss (PFISCAL) and the level of indebtedness (END) showed negative and significant relationships at the 1% level in all analyzed situations. Thus, a greater tax loss and greater indebtedness result in a decrease in the difference between the Tax Income and the Accounting Income of companies in Latin America. It is also verified that there is consistency between the results presented.

Next, Table 4 shows Pearson's correlation between the variables used in estimating Equation 3.

Table 4 - Pearson correlation

Variável	BTDA	CORRUP	TXIR	TAM	ROA	G
BTDA	1					
CORRUP	0,0269*	1				
TXIR	-0,0366***	0,7316***	1			
TAM	-0,1418***	-0,0173	0,0529***	1		
ROA	-0,0174	0,0264*	-0,0153	0,0654***	1	
G	0,3952***	-0,0443**	0,0181	-0,0118	-0,1061***	1

Note: \*\*\*/\*\*/\* sig.  $\geq$  1%, 5% and 10%, respectively.

Source: prepared by the authors.

According to Table 4, the corruption perception index in the public sector (CORRUP) presented a positive and significant correlation, at the 10% level, with the proxy for tax evasion (BTDA), indicating that the perception of corruption in the public sector can influence the practice of tax evasion in publicly traded companies in Latin America. On the other hand, the variable the tax rate on profits (TXIR) showed a negative and significant correlation, at the 1% level, with the BTDA, so that higher tax burdens can discourage tax evasion, possibly due to the fear of penalties high rates that are often associated with the nominal result of the incidence of the tax rate on the tax calculation base.

In turn, size (TAM) showed a negative correlation (-0.1418), announcing that larger companies have lower tax evasion, possibly due to the high level of control, and growth (G) showed a positive correlation (0.3952), possibly due to the higher level of incentives arising from the tax legislation for investments made by companies.

Also in Table 4, it is observed that there is a positive (0.7316) and significant correlation, at the 1% level, between the corruption perception index (CORRUP) and the tax rate on profits (TXIR), one of which is possible explanation that countries where the tax burden is higher,

there is a higher level of perception of corruption in the public sector by managers. Also, there is a positive correlation (0.0264) between ROA and the CORRUP variable, that is, returns on assets are higher in countries with a higher perception of corruption. As for growth (G), there is a negative correlation (-0.0443) with a higher perception of corruption.

To measure the influence of the public sector corruption perception index on tax evasion in publicly traded companies in Latin America, the econometric model proposed in Equation 3 was used, initially, the Chow test was performed, aiming to compare the restricted model (pooled) and the unrestricted model of fixed effects. The test was followed by the Hausman test to verify the best model between the random effects and the fixed effects. Finally, the restricted model was compared with the unrestricted random effects model, applying the Breusch-Pagan LM test (Clark & Linzer, 2015). Based on the tests applied, the results point to the fixed effects panel as the most appropriate analysis model.

With the assumption of normality in the data distribution relaxed, based on the central limit theorem, the tests of endogeneity, autocorrelation and homoscedasticity of the data were performed. For endogeneity, the Hausman test was used, and no evidence of endogeneity was found. Next, in Table 5, for autocorrelation between the variables, the Wooldridge test (0.000) was used, resulting in the existence of autocorrelation. As for homoscedasticity, the Wald test modified for panel data (0.0000) was used, discarding its presence (Wooldridge, 2002). Due to the heteroscedasticity and autocorrelation of the data, the regression in robust form was estimated to correct those problems.

After passing all the tests of assumptions for estimating the regressions, the regressions were estimated using balanced and unbalanced panel data, verifying that, in both forms, the results were not altered, nor was there a decrease in the efficiency of the estimator. With this, the unbalanced panel was chosen, aiming to increase the number of observations, so that the results obtained with the estimation of the econometric model proposed by Equation 3 are shown in Table 5.

In the three regressive models of fixed effects (within, between and general variation) estimated, the results remained persistent. The within fixed effects model was chosen because this model has the ability to capture the internal heteroscedasticity of each individual, for each period. Thus, taking into account that the research problem aimed at analyzing, specifically, the effect of the perception of corruption on the tax evasion rate within companies, the within variation fixed effects model was used.

Thus, it appears from the information in Table 5 that, on

average, the corruption perception index in the public sector (CORRUP) exerted a direct and significant influence, at the 1% level, on the tax evasion rate (BTDA). This result validates the research hypothesis (H1), based on the theory of broken windows, by bringing empirical evidence that the perception of corruption by the population can encourage the management of Latin American companies to carry out tax management that goes beyond legality, evading tax obligations, with the perception of social disorder and impunity generated by corruption (Kelling & Coles, 1997; Coutinho & Carvalho, 2003; Fukofuka, 2013; Engström et al., 2015; Júnior Brunozi et al., 2018).

Next, Table 5 shows an inverse and statistically significant relationship, at the 1% level, between the tax rate on profits (TXIR), applied to Latin American companies, and the BTDA, so that the increase in profit tax rate reduced the rate of tax evasion. This result, when associated with the theory of broken testicles, points out that higher tax rates, as they are accompanied by proportionally higher fines for non-compliance, can discourage the practice of tax evasion, causing a reduction in BTDA, as the benefit

expected may not be offset by the risk submitted by the company (Kelling & Coles, 1997; Coutinho & Carvalho, 2003; Strasser & Santos, 2015).

Therefore, it appears that the size (TAM) showed an inverse (-0.1027) and significant relationship, at the 5% level, with the BTDA. This evidence indicates that larger companies carry out less tax evasion, confirming what was theoretically expected, since larger companies have more robust internal controls and have a higher level of monitoring by investors and shareholders, determining less discretionary tax management due to the control mechanisms (Desai & Dharmapala, 2009; Santos, 2016). The growth (G) presented a direct and significant relationship, at the level of 5%, with the BTDA, so that the growth of assets led the companies in the sample, on average, to an increase in the tax evasion rate. This result may result from possible tax benefits that encourage investment in Latin American countries (Allingham & Sandmo, 1972; Han & Kung, 2015; Frank et al., 2009). The return on assets (ROA), in turn, did not show a significant relationship in the model.

Table 5 – Estimation of the regression of Equation 3 with all companies.

Variables	Within Variation		Between Variation		General Variation		VIF
	Coefficients	p-value	Coefficients	p-value	Coefficients	p-value	
<b>BTDA</b>							
CORRUP	0.8070	0,000	0,1124	0,032	0,1118	0,026	
TXIR	-0,6795	0,008	-0,4549	0,002	-0,4432	0,014	2,17
TAM	-0,1027	0,025	-0,0167	0,000	-0,0242	0,000	2,17
ROA	-0,2037	0,276	0,3679	0,000	0,0033	0,985	1,01
G	0,2287	0,041	0,3718	0,000	0,2352	0,028	1,02
Intercept	1,8343	0,027	0,4831	0,000	0,6478	0,000	1,02
<b>R<sup>2</sup></b>	<b>Within = 0.1777</b> <b>Between = 0.0832</b> <b>General = 0.0840</b> F (5,798) = 3,32 Prob>F 0,0056		<b>Within = 0.1301</b> <b>Between = 0.3227</b> <b>General = 0.1687</b> F(5,793) = 72,90 Prob>F = 0,0000		<b>0.0819</b> Wald chi2(5) = 18,11 Prob > chi2 = 0,0028		Obs. 5006 Grupos 771
Tests	Chow (F)	Breusch-Pagan	Hausman	Wooldridge	Wald		
	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	

Resultado dos testes: modelo de efeitos fixos

Source: prepared by the authors.

## Final Considerations

The purpose of this research was to verify the influence of the perception of corruption in the public sector on the tax evasion rate in Latin American companies, based on the association of the Broken Windows, the Shattered Testicles and the Prospectus Theories. In this sense, the study took into account the potentiation of tax aversion among taxpayers, given the perception of corruption, as a stimulus to the practice of tax evasion.

The results found lead to the understanding that the perception of corruption in the public sector by society can trigger tax evasion in companies. Also, empirical evidence was found in the study that the tax rate on profits discourages tax evasion in Latin American companies. The reduction in the level of tax evasion as a function of tax rates on profit may occur due to the greater risk involved in evasive management considered by taxpayers, since high tax rates can bring with it proportionally high fines compared to tax rates, in terms of nominal, because any penalties for non-compliance with the tax are normally based on the calculated tax. Thus, there is a need to broaden the debate on the evidence found, a greater depth in the analysis of each country and a more accurate discussion on public policies to combat corruption and its consequences on the level of tax evasion in companies in the countries of Latin America.

For all of the above, the study finds evidence that the perception of corruption in the sector can serve as a stimulus to evasion, as well as the sight of broken windows in an abandoned building, which, if not repaired, will nurture a sense of impunity and disorder, encouraging vandalism and breaking into the building. On the opposite side, evidence was also found that high tax rates can increase the fear of punishment, serving as a discouraging factor for evasive tax practices.

As limitations, in the course of the research, some difficulties and weaknesses were found, and it is important to point them out to the research advances in this theme. Among them, the implications of the adoption of the International Financial Reporting Standards (IFRS) in each country stand out, which may have caused accounting and tax differences in the period studied, and the difficulty in obtaining a proxy with effective accuracy to measure evasion tax, due to the impossibility of fully separating legal and illegal tax practices in the business scope through the financial statements disclosed, and it is relevant for the academy that other researches improve the proxies of tax avoidance and evasion. Therefore, it is important to indicate the vulnerability of measures for measuring tax evasion, which includes the one used in this research.

Furthermore, there may be other relationships not contemplated in the study that may interfere with the

understanding of the dynamics of tax evasion in companies that can modify the results obtained, such as: economic, legal and political situations in which companies may eventually find themselves.

In view of the non-randomness of the sample composition, the results revealed in this research are restricted to the period and to the analyzed companies, making it impossible to generalize them to the markets of the countries that composed the sample. Still regarding the results found, it is important to advance studies in other researches, which have the purpose of contributing to this theme, theoretically and methodologically, in order to seek other decision-making factors that can influence tax evasion.

Having overcome the limitations mentioned, it is important to emphasize that this research theoretically contributes to the academic environment, advancing in new perspectives that trace intersections between theories that permeate several scientific areas, such as Administration, Accounting Sciences, Law, Economics and Psychology, associating the theories of prospectus, broken windows and shattered testicles, to reveal that the ethical and political model of public management can influence management in the private sector, just as evidence was found that corruption can lead to tax evasion in Latin American companies. Likewise, the fear of penalties can lead social actors to follow the ethical and legal path, according to the evidence found that high tax rates, which will be accompanied by greater penalties, curb tax evasion.

For all of the above, the empirical evidence found expands the limits of studies related to organizational behavior and tax management, collecting new evidence that may explain a little more about the complexity of the corporate environment in developing countries.

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