Revista de Contabilidade e Organizações (2019) n. temático
Fraudes e Corrupção: o que Contabilidade e Organizações têm a dizer?
19-29

Revista de Contabilidade e Organizações
www.rco.usp.br

DOI: http://dx.doi.org/10.11606/issn.1982-6486.rco.2019.158516

Journal of Accounting and Organizations
www.rco.usp.br

Understanding corruption-fighting factors: proposing a corruption deterrence construct

Entendendo os fatores de combate à corrupção: proposta de um constructo de dissuasão à corrupção

Edimara Mezzomo Luciano[a], Guilherme Costa Wiedenhöft[b], Sabrina Callegaro[a]
[a] *Pontifícia Universidade Católica do Rio Grande do Sul*
[b] *Universidade Federal do Rio Grande*

Keywords
Corruption.
Causes of corruption.
Protection against corruption.
Public organizations.
Governance.

Abstract

The purpose of the article is to create a corruption protection construct that can explain the variation of corruption in different countries. This construct, called DECIDE, was based on four indicators related to administrative burden reduction, democracy, institutional quality and open government data, represented respectively by Global Open Data Index, Democracy Index, Ease of doing Business Raking, and Institutional Quality Index. These four indicators were analysed with the Corruption Perception Index (CPI). A database was created that was analyzed following all the requirements of the technique Partial Least Squares (PLS). The main result was the creation of DECIDE, which explains 50% of the CPI's perception of corruption during these years. The DECIDE, in turn, is explained by the four indicators. This construct provides a foundation for the context to be less conducive to corruption while broadening protection mechanisms. In practical terms, the study identifies that a less bureaucratic, more democratic, more transparent country where institutions work best is more protected from corruption, whereas these four variables act as a deterrent to corruption.

Palavras-chave
Corrupção.
Causas da corrupção.
Proteção à corrupção.
Organizações públicas.
Governança.

Resumo

O objetivo do artigo é a identificação das dimensões para criação de um constructo de dissuasão à corrupção que possa explicar a variação da corrupção em diferentes países. Este constructo, chamado de DECIDE, teve como base quatro indicadores: nível de desburocratização; nível de democracia; nível de qualidade institucional, e o nível de dados abertos, os quais foram mensuradas por meio de dados secundários obtidos por meio dos indicadores *Ease of doing Business Raking, Democracy Index, Institutional Quality Index*, e o *Global Open Data Index*. Esses indicadores foram relacionados com a variável Percepção de Corrupção, medida neste estudo por meio do Corruption Perception Index (CPI). Em posse dessas informações, foi criada uma base de dados, os quais foram analisados seguindo todos os requisitos da técnica de modelagem Partial Least Squares (PLS). O principal resultado foi a criação do constructo DECIDE, que está diretamente relacionado ao CPI e explica 50% da percepção da corrupção demonstrada pelo indicador para os 175 países analisados. As quatro variáveis supracitadas, em conjunto, permitem criar os alicerces para criação de um constructo de dissuasão à corrupção (DECIDE), indicando o contexto nacional menos favorável à corrupção, ao mesmo tempo em que ampliam o conhecimento para definição de estratégias e mecanismos de proteção contra a corrupção. Em termos práticos, o estudo permite identificar que um país menos burocrático, mais democrático, mais transparente e onde as instituições funcionam melhor está mais protegido da ocorrência de corrupção, considerando que estas quatro variáveis agem como um dissuasor da corrupção.

Article information
Received: May 30, 2019
Accepted: November 15, 2019
Published: November 28, 2019

Pratical implications

The study allows basing and/or expanding ongoing anticorruption programs. By understanding variables that help reduce corruption, countries may enable initiatives such as processes with less bureaucratization, greater transparency and higher levels of democracy, as well as the encouragement to economic and political institutions to promote development.

Corresponding author: Tel. +55 (51) 3320-3524
E-mail: eluciano@pucrs.br (E. M. Luciano); wiedenhoft@furg.br (G. C. Wiedenhöft); sabrina.callegaro@edu.pucrs.br (S. Callegaro)
Pontifícia Universidade Católica do Rio Grande do Sul. Av. Ipiranga, 6681 - Prédio 50 - Partenon, Porto Alegre/RS - 90619-900 , Brazil.

1 INTRODUCTION

Corruption is present in all countries (Brol, 2016) and is considered as a behavioral problem with individual, organizational, and cultural stimuli affecting economic, political, and legal systems. Corruption has been measured by a wide variety of approaches based on a combination of indicators and tools that exploit the potential of information technology. Thus, measuring corruption requires having a wide range of subjective and objective, individual and aggregate indicators among countries or country-specific. All these requirements are important for monitoring field results, assessing the concrete corruption reality and developing anticorruption programs (Kaufmann et al., 2006). Accordingly, the current efforts aimed at collecting data on laws and other sources must be expanded (Aladwani, 2016) to enhance the commitment needed to reduce corruption (Knack, 2016).

Due to corruption complexity, various international organizations have sought to understand both the motivations that can lead to corruption and the current situation regarding it in different countries. Such organizations have devoted efforts to maintaining rankings directly related to corruption, ranging from its causes and to those indicating characteristics such as the country's level of transparency, data openness, and its institutions' quality and democracy levels.

Given this context, we identified the opportunity to create a construct composed of variables indicating the country's management and governance maturity and how much such variables can contribute to reducing corruption. Based on historical data, it is possible to identify what kind of initiatives may deter corruption, as well as understand how much a country is engaged in deterring corruption.

Deterrence is understood as the pursuit for reducing corrupt activities. Severe repression can reduce corruption to lower levels, but disregard for its deterrence may raise it to higher levels (Lui, 1986), and it is necessary to promote alternatives to curb the increase in corruption. Deterrence of corruption acts as a joint function related to the possibility of detecting and punishing it (Miller, 1999), to discourage people involved from taking corrupt actions. As an example, it occurs when a public official becomes convinced that receiving bribes is not a right choice because the transparency process may expose such action to society, or anticorruption institutions would identify and punish such act.

The goal of this research is the identification of dimensions for the creation of a construct to deter corruption, called the Deterrence Corruption Construct (DECIDE). It is necessary to understand both the causes and the mechanisms that determine the corruption level of a country. Thus, we seek to answer the following question: what variables can represent a country's deterrence to corruption?

Different indices have already contributed to the study of corruption, in which the country was unit of analysis. They directly and/or indirectly explain the antecedents and deterrents of corruption, such as the Ease of Doing Business Ranking, the Democracy Index, the Institutional Quality Index and the Global Open Data Index. In this context, it is appropriate to develop a construct that jointly analyzes the impact of these different indices on a country, thus indicating which variables play a major role in protecting it from corruption.

2 LITERATURE REVIEW

The term corruption includes a wide variety of acts: cheating, deception, deceit, illegitimate gain, swindling, concussion, tampering, spoofing, fraud, bribery, embezzlement, extortion, nepotism, and others (Brei, 1996). More specifically, corruption can be understood as an abuse of power for one's own benefit, being classified as petty or grand, depending on the amount of money involved and the sector in which the action takes place (Transparency International, 2019).

It is said that corruption generates more corruption. Political leaders may either spur efforts to reduce its virulence of corruption or open the gates to corruption and decay in society. The acceptability and growth of corruption within a nation drastically depends on how its leaders position themselves, how they deal with the needs of political parties, and the unbridled (or repressed) greed of subordinates (Rotberg, 2019).

It is possible to identify in literature different approaches to corruption, presenting several dimensions of studies, especially legal, economic, political, cultural and administrative. Each of these approaches brings different understandings about the causes of corruption and the possible ways to reduce its occurrence or intensity.

In the legal dimension, corruption is seen in three aspects. The first is the bad law enforcement (Speck, 2003), the second is the lack of them (Teles, 2007), and the third is the creation of laws that contribute to corruption (Dias & Bento, 2011). However, not every transgression of laws or norms constitutes corruption. Laws in some cases may be insufficient or dubious, allowing for varied interpretations, thus contributing to the occurrence of corruption. In cases such as these, violating the law becomes a rule of conduct, constituting a discrepancy between what is written and the actual conduct (Brei, 1996).

Corruption has negative effects on economic growth by reducing the quantity and quality of infrastructure and public services provided to the private sector, topics studied by the economic perspective of corruption. Such studies mainly involve obtaining illegal financial advantages from agents involved (Del Monte & Papagni, 2001). In addition to the damaging effects that corruption brings to countries' economies by increasing the costs of financial transactions, it also reduces foreign investment and impairs economic growth (Aidt, 2003).

Policies to deter corruption and increase public institutions' efficiency may produce a positive effect on economic growth (Del Monte & Papagni, 2001). Conversely, corruption may cause a negative effect to the economic system, such as the limitation of incentives to accumulate physical, human, and financial capital, weakening the institutions that stimulate economic growth and development (Dias & Bento, 2011).

The political dimension of corruption studies can be exemplified by vote buying (Speck, 2003) and nepotism (Pascarelli Filho, 2013). When buying votes, the relationship between voter and candidate is based on a system of asymmetrical exchanges, revealing power discrepancy between politicians and the vast majority of voters. (Speck, 2003). Ferraz e Finan (2008) characterize the political aspect of corruption as any irregularity associated with procurement fraud, misappropriation of public funds and overpricing resulting from political manipulation.

According to Power and González (2003) the cultural dimension assumes that the incidence of corruption varies widely among societies, from unusual to systemic, and developed countries present a lower incidence of corruption than developing nations. In such cases, the authors suggest that corruption may be endemic in poor, undemocratic or politically volatile countries, and cultural attributes may explain at least part of the corruption level variation among and within regions of the world. In complementation, Del Monte and Papagni (2001) state that the way societies tolerate both corruption and corrupt agents is linked to aspects such as beliefs, predominant religion, ideas, the influence of the media and social behavior. Thus, from this point of view, corruption will only be reduced if culture is changed. Therefore, corruption is a systemic complaint and a top-down malaise, i.e., corruption spreads down into the permissive attitudes and policies of people at the top of political, public and corporate entities. The leaders set the tone and the stage and thus, integrity or its absence infiltrates the collective social conscience to make corruption a continuous social practice: an essential (although forbidden) component of a governing political culture; or sometimes the opposite, as it may create legal and social barriers to the general approval of corrupt practices (Rotberg, 2019).

Regarding studies on the administrative dimension, Melo, Sampaio and Oliveira (2015) show that business start-ups in Brazilian states are negatively affected by the incidence of corruption. According to the authors, the high bureaucracy and the amount of procedures to formalize a company should be reevaluated by the government, providing a less bureaucratic environment and, consequently, lower incidence of corruption.

3 THEORETICAL MODEL AND HYPOTHESES

The Model presented in Figure 1 is based on the general hypothesis that administrative burden reduction, the level of democracy, institutional quality, and data openness are determinant factors for the elaboration of a corruption deterrent construct capable of expressing a country's corruption score. Thus, we assume that these factors contribute to the elaboration of measures that dissuade the persons involved from committing corrupt acts.

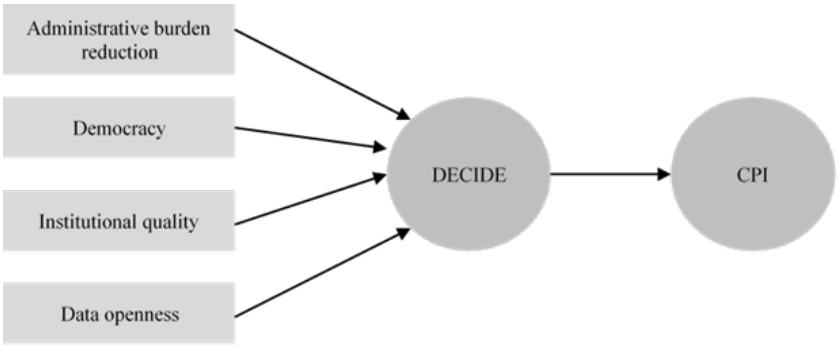

Figure 1. Research theoretical model
Note: CPI: Corruption Perception Index

The Theoretical Model consists of the following constructs and variables, presented in Chart 1:

Construct	Variable	Data for measurement	Source
Corruption perception	Corruption perception	Corruption Perceptions Index (CPI)	Transparency International
Corruption deterrence	Administrative burden reduction level	Doing Business	World Bank Group
	Democracy level	Democracy Index	Economist Intelligence Unit
	Institutional quality level	Institutional Quality Index	Red Liberal de America Latina, Fundacion Libertad y Progreso, Fundacion Friedrich Naumann para la Libertad
	Data openness level	Global Open Data Index	Open Knowledge Foundation

Chart 1. Constructs and variables

According to Aidt (2003), three conditions are essential for corruption to occur continuously. The first is the discretionary power of public officials, as they must have the authority to freely administer or design regulations and policies. The second is permission to officials to extract rents or create rents to be extracted. Moreover, the third is the existence of weak institutions – political, administrative and legal – that allow officials to use their discretionary power to extract or create rents.

These three conditions, associated with individual behavior, can cause the latter to be affected by less transparent and more bureaucratic systems, leading to the occurrence of corruption, even if the subject is guided by ethical principles (Santos et al., 2013). According to the authors, people call themselves extreme followers of an ethical conduct in their private and public life, valuing honesty and probity, but the average behavior indicates the opposite, especially when associated with lack of impunity (Silva, 1999). In this sense, transparency is an important tool that acts as a social control mechanism capable of reducing the possibility of corruption. Accountability to the community via data openness is one of the mechanisms that can contribute to this end.

It is agreed that the mechanisms of protection against corruption are linked to less bureaucratization, which reduces the discretionary power of the public servant and facilitates the strategies of transparency of the actions of public agents. Similarly, mechanisms for strengthening democracy, in synergy with quality public institutions, can mitigate the possibilities of corruption by curbing possible abuses by public officials.

The bureaucracy index is originally called Doing Business and presents quantitative indicators on business regulation and protection of property rights. It measures aspects of regulation and their implications for business establishment and operations. The value is presented in percentages from 0 to 100 and, the higher the value presented, the less bureaucratic the conduct of business in the country. For example, it indicates that starting a business in Brazil takes 82 days, but in Estonia, it takes 4 hours. Public servants can take advantage of this delay as a vulnerability to solicit bribes, thereby speeding up procedures.

The Democracy Index measures the country's level of democratization and is based on five categories: electoral process and pluralism, civil liberties, the functioning of government, political participation and political culture. The result is scored from 0 to 10, and the higher the value, the more democratic the country. Countries with lower levels of openness and democracy are more susceptible to corruption as it may be necessary, for example, to pay a bribe to access justice. Proof of this is that countries in the worst positions of the CPI also have dictatorial or undemocratic government regimes.

The Institutional Quality Index, IQI (or ICI , from the original in Spanish, being the C for Cualidad), refers to the economic and political institutions and their quality to promote the development of the nation, and its measurement ranges from 0 to 1. For example, a public servant could be deterred from committing corrupt acts, because institutions that reduce vulnerabilities or punish corruption would quickly identify the corrupt act and punish it.

Furthermore, the Data Openness Index, Global Open Data Index, refers to the government's publication of open data. It is made available annually and allows the government's progress in the data disclosure process to be monitored. The index is available as a percentage from 0 to 100, and the higher, the more open data is available. One of the main functions of open data sets is to allow social control of the actions of public entities, helping to identify acts of corruption.

Considering the argumentation above, we formulated the following hypotheses:

H_1: Deterrence of corruption has a positive and significant relationship with administrative burden;

H_2: Deterrence of corruption has a positive and significant relationship with democracy.

H_3: Deterrence of corruption has a positive and significant relationship with institutional quality.

H_4: Deterrence of corruption has a positive and significant relationship with the opening of government data.

Poorly transparent and bureaucratic systems, in addition to the possibility of affecting individual behavior, can also influence the processes and procedures of public organizations (Puron-Cid, Reddick & Ganapati, 2019). Such procedures can be exemplified by procurement and administrative practices, budget management, project and financial audits, expense reports, among others (Gouvea, Montoya & Walsh, 2013). These types of processes and procedures are among the most common violations found in audit reports (Ferraz & Finan, 2008).

For Klitgaard (1988), corruption is a problem of asymmetric information and incentive, which can be explained by the principal-agent-client model of Agency Theory. According to this model, civil servants are honest, but if they have access to monopolies, they will have discretionary power and, if they operate without accountability, corruption may occur. Therefore, the problem of corruption arises in situations with information asymmetry. In other words, agents know much more about management and its processes than other parties (Krishnan, Teo & Lim, 2013). In such situations, agents may exploit their position as intermediaries and use the power entrusted to them to act in their own interest, usually through bribery, extortion, fraud, nepotism, or embezzlement (UNODC, 2004).

Corruption is an evil that affects everyone and is studied according to different aspects, dimensions, approaches and visions. Regarding visions, corruption can be: a) economic, as defined by Andvig et al. (2000), which occurs in market situations and is linked to exchanges of money or material goods; b) social, considered a form of clientelism that unfolds as nepotism, protection or favoritism (Andvig et al., 2000), and can also be attributed to identifiable social, economic and political factors (Power & González, 2003); and c) cultural, which discusses whether or not factors of corruption may be independent of culture (Power & González, 2003), varying by region or country.

Regarding the dimensions of the study, the variables are distinct. Melo, Sampaio and Oliveira (2015) show, for example, that the opening of companies in Brazilian states is negatively affected by the incidence of corruption in the administrative dimension. For these authors, bureaucracy in the regulation of businesses is pointed as a limiting factor to the opening of companies.

Corruption deterrence affects reducing the occurrence of corruption because the four variables analyzed act as elements that can demolish corruption perpetrators. If there is greater transparency, they may feel exposed and give up committing corrupt acts.

Accordingly, if institutions work well, there may be certainty of punishment or speed of punishment acting to discourage illicit acts. Lower levels of bureaucracy can lead to a reduction in situations where the discretionary power of the civil servant can be used for corrupt acts. Finally, higher levels of democracy work to maintain a balance between institutions, bureaucratic apparatus, stakeholder pressure, and understanding of the role of the civil servant. Thus, these four variables act to deter corruption. From the above, it becomes clearer the possibility of relating the mechanisms that decrease the perception of corruption of a country with the CPI, thus defining Hypothesis 5, as follows:

H_5: Corruption deterrence has a positive and significant relationship with the Corruption Perception Index.

If the country is perceived as corrupt, disbelief in institutions and impunity create a vicious circle that increases the perception of corruption and shows the low effectiveness of protection mechanisms. Thus, a positive relationship between DECIDE and CPI is expected as both converge to lower corruption, i.e., if DECIDE mechanisms are effective, the country's position in CPI will be better.

4 RESEARCH METHOD

According to the Burrel and Morgan (1979) classification, this research was developed under the functionalist paradigm and is methodologically characterized as exploratory, descriptive cross-sectional, and with quantitative focus due to the employed data collection and analysis techniques.

We used the Partial Least Squares (PLS) method as data analysis technique. According to Nascimento e Silva-Macedo (2016), it is important to consolidate the use of PLS-SEM in accounting, given the growing emphasis given by researchers in this area, especially in Management Accounting, as it enables the development of more holistic models. In addition, Hair et al. (2016) states that PLS is a set of multivariate statistical techniques, which allow the simultaneous examination of a series of theoretical relationships between one or more independent variables, whether continuous or discrete and also one or more dependent variables, also continuous or discrete. For the author, PLS belongs to the second generation of structural equation analysis techniques and was developed to maximize the predictive accuracy of models, providing flexibility for structural equation modeling. In the PLS technique, there are no assumptions about the distribution of variables, there is no need to transform indicators to reduce their asymmetry and the required sample size may be smaller than in the covariance-based structural equation model (Hui, 1978). Figure 2 summarizes the main research steps.

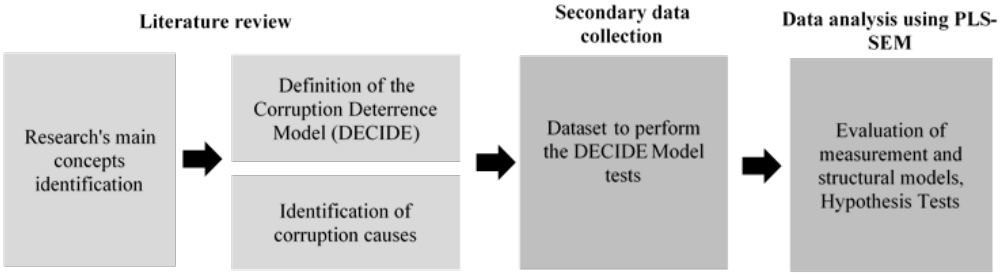

Figure 2. Research design

We performed the research data analysis with the aid of the SmartPLS® tool, version 2, following the recommendations of Ringle, Silva and Bido (2014) and Nascimento e Silva-Macedo (2016). Table 2 presents the steps of analysis, the techniques employed and how to use SmartPLS® v.2.0 software to extract the information used in the data analysis.

PLS-SEM Analysis Steps	Technique (Reference)	SmartPLS® v.2.0
Test the discriminant validity of the research model	Cross Loading (Chin,1998; Hair et al., 2016); Fornell and Larcker criterion (1981)	Step by step: 1. Access "Calculate"; 2. Select "PLS Algorithm"; 3. Select "Path Weighting Scheme"; 4. Press "Finish". Report: PLS (Default Report) Calculation Results Outer Loadings Quality Criteria Latent Variable Correlations Overview
Test the convergent validity or the research model	Average Variance Extracted (Henseler, Rigle and Sinkosvics, 2009); Outer Loadings (Hair at al., 2016)	
Test the reliability of the research model	Composite reliability: CR e Cronbach´s Alpha (Hair at al., 2016)	
Evaluate the relationship between the Corruption Deterrence Construct (DECIDE) and the Perceived Corruption Index (CPI)	Bootstrapping: t Test >1,96 (Ringle, Silva and Bido, 2014)	Step by step: 1. Access "Calculate"; 2. Select "Bootstrapping"; 3. Configure "Cases" for 175 (size of sample); 4. Configure "Sample" for 5000 (size of sub-sample); 5. Press "Finish". Report: Bootstrapping (Default Report) Path Coefficients (Mean, STDEV, T-Values). Outer Loadings (Mean, STDEV, T-Values)
Test Relevance and Predictive Validity of the Model	Stone-Geisser indicator (Q2) and Cohen indicator (f^2). (Ringle, Silva and Bido, 2014)	Step by step: 1. Access "Calculate"; 2. Select "Blindfolding "; 3. Press "Finish". Report: Blindfolding (Default Report) Construct Cross validated Redundancy

Chart 2. Analysis algorithm of PLS-SEM using SmartPLS® v.2.0

We conducted the research taking into account the Corruption Perception Index, created and maintained by Transparency International to classify a list of 175 countries from the least to the most corrupt. CPI reflects the perception of a large number of experts and has been consolidated as the leading index related to corruption. We used the CPI as a dependent variable, and also the first-order construct DECIDE, consisting of four factors to deter corruption, which we built by researching the specific literature.

5 RESULTS

To test the relationship between the corruption deterrence construct and the Corruption Perception Index (CPI), data were entered into SmartPLS®, and the indicators mentioned earlier in this article were evaluated. The analysis of the Measurement Model began with the assessment of Other Loadings, CVA, Composite Reliability, and Discriminant Validity (Table 1).For structural model analysis, the first indicator to be observed involves Pearson's coefficients of determination (R^2) (Ringle, Silva & Bido, 2014). According to the authors, the R^2 indicators assess the portion of the variance of endogenous variables, which is explained by the structural model, indicating the quality of the adjusted model. Cohen (1988) suggests that in the area of Social and Behavioral Sciences, $R^2 > 0.02$ is classified as small effect, $R^2 > 0.13$ as medium effect, and $R^2 > 0.26$ as large effect.

In the structural model analysis, SmartPLS®, through the Bootstrapping module, calculates Student's t-tests between the original data values and those obtained by the resampling technique, for each correlation relationship between the Latent Variables, in order to verify the significance of the paths between latent variables. Finally, the values of Q^2 (predictive capacity < 0), f^2 (effect size) for applied social sciences are considered to be 0.02 (small), 0.15 (medium), 0.35 (large) (Ringle, Silva & Bido, 2014).

Table 1. Test of the measurement model

Variable	Load-ing	AVE	CC	R^2	Discriminant variable		
DECIDE		0.525	0.796	n.a.		CPI	DECIDE
Administrative burden reduction	0.604*				CPI	0.866	
Democracy	0.724*				DECIDE	0.707*	0.725
Institutional quality	0.817*						
Data openness	0.657*						
CPI		0.750	0.937	0.499			
CPI 2012	0.923						
CPI 2013	0.941						
CPI 2014	0.907						
CPI 2015	0.759						
CPI 2016	0.785						

Note: *P < 0,001.

Table 1 shows that Other Loadings are greater than 0.4, Average Variance Extracted (AVE) is superior to 0.5, and composite reliability greater than 0.6, demonstrating the adequacy of the measurement model (Hair et al., 2016). Discriminant validity is obtained to the extent that latent constructs or variables are independent of each other by the criterion of Fornell and Larcker (1981). This criterion consists in comparing the square roots of the AVE values of each latent variable (or constructs) with Pearson correlations between the constructs. The square roots of strokes should be larger than the correlations between the constructs (Hair et al., 2016).

After analysis of the measurement model, the first value to be observed in the structural model is relative to the values of Pearson's determination coefficients (R^2). R^2 indicators evaluate the variance portion of the endogenous variable (Corruption Perception Index), which is explained by the exogenous variable of the structural model (Deterrence Corruption construct - DECIDE), indicating the quality of the adjusted model (Ringle, Silva & Bido, 2014).Thus, this study obtained as Pearson's coefficient of determination (R^2) the value of 0.707 for the relationship between DECIDE and CPI, considered by Ringle, Silva and Bido (2014) as a high effect relationship. It means that each time the DECIDE value increases by one point, the CPI value increases by 0.707, which improves the ranking position. All the tests carried out allow us to conclude that the proposed model is adequate, allowing us to test the general hypothesis of this study, namely that a country can protect itself from corruption through bureaucracy, democratic processes, the quality of its institutions, and opening the data.

The t-values were also calculated between the original data values and those obtained by the resampling technique using the SmartPLS® Bootstrapping module. Table 2 shows the effect sizes and significance of the relationships identified between the Perceived Corruption Index (CPI) variable and the Deterrence Corruption (DECIDE) construct.

Table 2. Test of significance of relationships between constructs

	Original data (O)	Sample mean (M)	Standard deviation	Standard error	T-statistics	P-values
DECIDE → CPI	0.707	0.718	0.033	0.033	21.464	0.0001

Based on the tests performed, it can be inferred that a country's Bureaucracy, Democracy, Institutional Quality and Data Openness levels contribute to the formation of a Corruption Protection construct, reducing the perceived corruption in a country.

Although the adoption of corruption prevention actions in a country is extremely complex and multifaceted, the results obtained in this research allowed us to identify four indicators that can individually constitute initiatives for the creation of mechanisms to reduce vulnerabilities to corruption. Together, they reinforce the actions of governments and control institutions (with the country as a unit of analysis and action) to reduce levels of corruption. Thus, administrative burden reduction, democracy, the quality of government and control institutions, and data openness constitute the starting point for reducing levels of corruption.

From time to time, data openness enables the increase of active transparency, which is fundamental to the accountability process. Transparency and accountability are abstract as they refer to a broader concept of government openness. Still, data openness enables social control by the population and is an activity of great importance both in the supervision of acts of public agents and in accountability, publicly disclosing potential acts of corruption. In this sense, the relationship between data openness and corruption reduction finds conceptual, statistical and practical support.

In the same vein, countries with higher levels of democracy are better deterred from corruption. Looking at the CPI, one can see that the last positions in the ranking (countries with the highest occurrence of corruption) are countries with undemocratic regimes, such as absolutist monarchies, one-party republics, dictatorships, autocracies or theocracies. Such relationship has been statistically proven.

Institutional quality involves maintaining the role of controlling, preventing and punishing corruption, even in unfavorable situations such as economic, political or trusting crises. This indicator shows that in countries where public institutions play their role there is a reduction in corruption. Thus, the relationship between the quality of institutions and the deterrence of corruption also finds conceptual, statistical and practical support.

The administrative burden is also a variable involved in deterring corruption, as high levels of discretionary power by civil servants, presented in more bureaucratic models, constitute a vulnerability to the occurrence of corruption. Thus, the statistically proven relationship in this research is supported by the observation of the corruption phenomenon in organizations. Excessive bureaucracy affects the management of public resources, contributing to the occurrence of corruption, i.e., simplification of administrative processes and more modern and transparent public management through open data can reduce the opportunities for acts of corruption to be committed.

Together, these variables make it possible to build foundations to make the context less conducive to the generation, growth, and maintenance of corrupt actions and processes, while at the same time broadening the mechanisms to protect the occurrence of corruption, manifested by the lower number of cases, or for quick detection and disruption. All of this may be achieved through lower levels of bureaucracy, higher levels of democracy, better government and social control institutions (formal or otherwise), and greater data openness through open data portals, transparency and even open government mechanisms.

6 CONCLUSIONS

Corruption is a factor that can alter a country's development, affecting the social evolution and quality of life of its population. In this sense, the main objective of this study was to propose and test a corruption deterrence construct, able to allowing reduce levels of corruption. The DECIDE construct was based on the levels of administrative burden reduction, democracy; institutional quality, and data openness, which show the maturity of management and governance of a country, measured by a set of international indexes, namely: Global Open Data Index, Democracy Index, Ease of Doing Business Ranking, and the Institutional Quality Index.

According to statistical tests performed using PLS, DECIDE allows to explain 50% of the occurrence of CPI or the perception of corruption in the 175 countries analyzed. Together, the four dimensions of DECIDE make it possible to build the foundations for the context to be less conducive to corruption while broadening protection mechanisms.

The main contribution of this research is the creation of the DECIDE construct and the identification of four variables that positively impact the reduction of perceived corruption. Reducing levels of corruption is something very abstract, and therefore needs to be initiated and pursued through mechanisms that, at the end of a maturity cycle, have reduced the occurrence or impact of corruption in a country. The main practical contribution is to identify the impact of the constructs as a deterrent to corruption, which can underpin or broaden ongoing programs, thereby increasing the social and public value of these initiatives.

Among the limitations of this research, it is important to consider that the results should be interpreted limited to the data from 175 countries. Such data consider the context of each country internally, but no contextual analysis was conducted in this research. The study selected four variables and related them to corruption. Moreover, other variables may also affect the deterrence of corruption.

To continue this study, we suggest two possibilities. The first is the DECIDE's evolution from a construct to an index, allowing dynamic analysis of contextual variables. Case studies in some of the countries listed in the CPI are also suggested, verifying in loco the DECIDE variables. Interviews with citizens of these countries may also complement contextual analyzes.

REFERÊNCIAS

Aidt, T. S. (2003). Economic analysis of corruption: a survey. *The Economic Journal*, 113(491), 632-652. DOI:10.1046/j.0013-0133.2003.00171.x.

Aladwani, A. M. (2016). Corruption as a source of e-Government projects failure in developing countries: A theoretical exposition. *International Journal of Information Management*, 36(1), 105-112. DOI: http://dx.doi.org/10.1016/j.ijinfomgt.2015.10.005.

Andvig, J. C., Fjeldstad, O. H., Amundsen, I., & Søreide, T. (2000). *Research on Corruption A policy oriented survey*. Commissioned by Norad, 158p.

Brei, Z. A. (1996). Corruption, ethics and administration, corruption and morality in administration public, political corruption, administrative corruption. *Revista de Administração Pública*, 30(1), 64.

Brol, M. (2016). Institutional determinants of corruption. Ekonomia i Prawo. *Economics and Law*, 15(1), 21-32. DOI: http://dx.doi.org/10.12775/eip.2016.002.

Burrell, G. (8). Morgan, G.(1979). *Sociological Paradigms and Organizational Analysis. Elements of the Sociology of Corporate Life.* Ashgale Publishing Company: Burlington, USA.

Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. New York: Psychology Press, 1988.

Del Monte, A., & Papagni, E. (2001). Public expenditure, corruption, and economic growth: the case of Italy. *European Journal of Political Economy*, 17(1), 1-16. DOI: http://dx.doi.org/10.1016/s0176-2680(00)00025-2.

Dias, J., & Bento, F. (2011). Corrupção e teoria econômica. *Economia & Tecnologia*, 7(26), 1-8. DOI: http://dx.doi.org/10.5380/ret.v7i3.26615.

Ferraz, C., & Finan, F. (2008). Exposing corrupt politicians: the effects of Brazil's publicly released audits on electoral outcomes. *The Quarterly journal of economics*, 123(2), 703-745. DOI: http://dx.doi.org/10.1162/qjec.2008.123.2.703.

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error. *Algebra and statistics*. DOI: http://dx.doi.org/10.2307/3150980.

Gouvea, R., Montoya, M., & Walsh, S. (2013). How the corruption Quadruple Helix affects BRIC: A case study of corruption in big emerging economies. *J. Pol. & L.*, 6(1). DOI: http://dx.doi.org/10.5539/jpl.v6n2p1.

Habib, M., & Zurawicki, L. (2002). Corruption and foreign direct investment. *Journal of International Business Studies*, 33(2), 291-307. DOI: http://dx.doi.org/0.1057/palgrave.jibs.8491017.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). A primer on partial least squares structural equation modeling (PLS-SEM). *Sage publications*. DOI: http://dx.doi.org/10.1080/1743727x.2015.1005806.

Hui, A. K., Armstrong, B. H., & Wray, A. A. (1978). Rapid computation of the Voigt and complex error functions. *Journal of Quantitative Spectroscopy and Radiative Transfer*, 19(5), 509-516. DOI: http://dx.doi.org/10.1016/0022-4073(78)90019-5.

Index, C. P. (2017). *Transparency international*. Disponível em: https://www.transparency.org/cpi2018.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2006). Measuring Corruption: Myths and Realities. *The World Bank*, 8(2), 37-41. Disponível em: http://documents.worldbank.org/curated/en/573111468314083144/pdf/436210NEWS0BOX0327375B01PUBLIC1.pdf#page=39.

Klitgaard, R. (1988). *Controlling corruption*. University of California Press, 230p.

Knack, S. (2006). Measuring corruption in Eastern Europe and Central Asia: a critique of the cross-country indicators. *The World Bank*. Disponível em: https://openknowledge.worldbank.org/handle/10986/8377.

Krishnan, S., Teo, T. S., & Lim, V. K. (2013). Examining the relationships among e-government maturity, corruption, economic prosperity and environmental degradation: A cross-country analysis. *Information & Management*, 50(8), 638-649. DOI: http://dx.doi.org/10.1016/j.im.2013.07.003.

Teles, V. K. (2007). Institutional quality and endogenous economic growth. *Journal of Economic Studies*, 34(1), 29-41. DOI: http://dx.doi.org/10.1108/01443580710717200.

Lui, F. T. (1986). A dynamic model of corruption deterrence. *Journal of Public Economics*, 31(2), 215–236. DOI: http://dx.doi.org/10.1016/0047-2727(86)90019-8.

Miller, S. (1999). Noble cause corruption in policing. *African Security Studies*, 8(3), 12-22.

Melo, F. L. N. B. de, Sampaio, L. M. B., & de Oliveira, R. L. (2015). Corrupção burocrática e empreendedorismo: Uma análise empírica dos estados brasileiros. R*evista de Administração Contemporânea*, 19(3), 374-397. DOI: http://dx.doi.org/10.1590/1982-7849rac20151611.

Nascimento, J. C. H. B. do, & Silva-Macedo, M. A. da. (2016). Modelagem de equações estruturais com mínimos quadrados parciais: um exemplo da aplicação do SmartPLS® em pesquisas em Contabilidade. *Revista de Educação e Pesquisa em Contabilidade*, 10(3), 289-313.

Pascarelli Filho, M. (2013). *A nova administração pública: profissionalização, eficiência e governança*. DVS Editora.

Power, T. J., & González, J. (2003). Cultura política, capital social e percepções sobre corrupção: uma investigação quantitativa em nível mundial. *Revista de Sociologia e Política,* (21), 51-69.

Puron-Cid, G., Reddick, C. G., & Ganapati, S. (2019). Public value of online financial transparency: Financial sustainability and corruption of public officials in the US state governments. *International Journal of Public Sector Management*. DOI: https://doi.org/10.1108/IJPSM-03-2018-0073.

Ringle, C. M., Silva, D. da, & Bido, D. D. S. (2014). Modelagem de equações estruturais com utilização do SmartPLS. *Revista Brasileira de Marketing*, 13(2), 56-73. DOI: https://doi.org/10.5585/remark.v13i2.2717.

Rotberg, R. I. (2019). *Corruption in North America: Canada and the United States*. In Canada–US Relations, 261-282). Palgrave Macmillan, Cham.

SANTOS, R. A. D. (2013). *Institutionalising anti-corruption in Brazil: the path of the Controladoria-Geral da Uniao (CGU)*. 323f (Doctoral dissertation, Tese. Department of Politics, University of Sheffield, Sheffield, Inglaterra).

Silva, L. A. S. D. (1999). *Corrupção e promiscuidade entre os setores público e privado na gestão do sistema financeiro nacional: a liberalização financeira e a abertura da conta de capital (as contas CC-5*). Brasília, DF: Confederação Nacional dos Bispos do Brasil (not published).

Speck, B. W. (2003). A compra de votos: uma aproximação empírica. *Opinião Pública*, 9(1), 148-169. DOI: http: /dx.doi.org/10.1590/s0104-62762003000100006.

Srivastava, S. C., Teo, T. S., & Devaraj, S. (2016). You Can't Bribe a Computer: Dealing with the Societal Challenge of Corruption Through ICT. *Mis Quarterly*, 40(2), 511-526.

Taylor, M. M., & Buranelli, V. C. (2007). Ending up in pizza: accountability as a problem of institutional arrangement in Brazil. *Latin American Politics and Society*, 49(1), 59-87. DOI: http://dx.doi.org/10.1111/j.1548-2456.2007.tb00374.x.

Timothy, J., & González, J. (2003). Cultura política, capital social e percepções sobre corrupção: uma investigação quantitativa em nível mundial. *Revista de Sociologia e Política*, 21.

TOOLKIT, U. A. C. (2004). *The Global Programme Against Corruption*: *UN Anti-Corruption Toolkit*. UNODC. Disponível em: https://www.un.org/ruleoflaw/blog/document/the-global-programme-against-corruption-un-anti-corruption-toolkit/.