



POWER FLOWS AND PUBLIC TRANSPARENCY IN MUNICIPALITIES OF PARANÁ AND SANTA CATARINA DURING THE COVID-19 PANDEMIC

Social network analysis

Cleber Andrio Pedralli

Master's degree in sustainable territorial development from the Federal University of Paraná (UFPR). Specialist in constitutional and administrative law by University Estacio de Sa (UNESA). Bachelor's degree in law from the University of Joinville (UNIVILLE). Prosecutor for the Municipality of Garuva (State of Santa Catarina, Brazil).

Lattes: <http://lattes.cnpq.br/7182448651672511>

Orcid: <https://orcid.org/0009-0007-2810-5428>

E-mail: cleber@pedralli.com.br

Rodrigo Rossi Horochovski

Doctoral degree in political sociology from the Federal University of Santa Catarina (UFSC). Master's degree in sociology from the Federal University of Paraná (UFPR). Bachelor's degree in social science from UFPR. Full Professor at the Federal University of Paraná UFPR.

Lattes: <http://lattes.cnpq.br/7124028943127330>

Orcid: <https://orcid.org/0000-0003-1135-0543>

E-mail: rodrigoh33@gmail.com

Ivan Jairo Junckes

Post-doctoral degree in political sociology from the Universidad Complutense de Madrid, Kings College London (2015) and from the University of the State of Ponta Grossa (UEPG). Doctoral degree in political sociology from the Federal University of Santa Catarina (UFSC). Master's degree in political sociology from UFSC. Bachelor's degree in psychology from the Federal University of Santa Catarina (UFSC). Professor at the Federal University of Paraná (UFPR)

Lattes: <http://lattes.cnpq.br/8866772680917193>

Orcid: <https://orcid.org/0000-0001-8305-3754>

E-mail: ivanjairojunckes@gmail.com



ABSTRACT

The novel coronavirus (SARS-CoV-2) has profoundly impacted the contemporary world, presenting an unprecedented mortality rate. In this context, the implementation and effectiveness of public policies have been widely questioned, as have the targets of the Sustainable Development Goals (SDGs), particularly those of Goals 3 and 16, which face significant uncertainties regarding their responsiveness. This study aimed to identify the nodes and power dynamics present in municipalities in the states of Santa Catarina and Paraná responsible for shaping the legal transparency of financial resources allocated to combat the pandemic. The research was conducted primarily through the systematization of information available on official websites and the use of Social Network Analysis (SNA) methodologies. Data processing was carried out using spreadsheet software, and Gephi software was utilized to evaluate flows and network metrics. The main results identified within the network include: *i*) high centrality nodes – the Office of the Comptroller General (CGU) and the Citizen; *ii*) medium centrality nodes – State Courts of Audit (TCs); and *iii*) low centrality nodes – internal control mechanisms and municipal Legislative Powers; in addition to the respective associated power flows.

Keywords: social network analysis; transparency; public resources; COVID-19; power flows; Santa Catarina and Paraná.

Submitted on: May 9, 2024.

Accepted on: December 17, 2025.

1 INTRODUCTION

In September 2015, the United Nations General Assembly (UN) approved the 2030 Agenda for Sustainable Development (ONU, 2015a), establishing a universal plan of action aimed at guiding the world towards a more sustainable and resilient future. Structured as an integrated, interdisciplinary and indivisible whole, the Agenda covers areas of critical importance to humanity and to the planet, incorporating interconnectivity as a guiding principle of both its vision and its public policy guidelines.

No country has shown exemplary performance in all areas covered by the Agenda and, historically, progress in certain SDGs has not always been aligned with other public policy fronts, such as biodiversity conservation, mitigating climate change, or initiatives aimed at transparency and accountability (Ament *et al.*, 2020).

In this multifaceted context, a pandemic spread and, with it, a health crisis unprecedented in contemporary times, which strongly impacted the goals that would lead to the achievement of the objectives as originally proposed. As a consequence, the search for universal access to health, for medicine supply and for vaccine distribution—as established in the targets of SDG 3 (ONU, 2015b), namely, health and well-being—has become the core of the debate on a global scale.

These discussions influenced public authorities from several countries to adopt a series of measures, such as social isolation, emergency adaptation of health systems, and the



drafting of specific regulations, both for medical procedures and for the use of finite financial resources.

In Brazil, this led political actors to the approval of several laws that instituted specific public policies in the context of the pandemic context. Among them, Law 13,979, dated February 6, 2020 (Brazil, 2020b), with enforcement restricted to the period of public emergency, which established general rules for the Public Administration to combat COVID-19. The legislation defined parameters for hiring labor, acquiring health supplies, and establishing mechanisms to ensure the transparency of public spending related to actions to address the pandemic.

In this context, the current study sought to identify, within the scope of the Executive Branch and based on Federal Law 13.979/2020 (Brazil, 2020b), the main actors and respective power dynamics that structured the legal transparency of public resources destined to combat COVID-19 in municipalities in the states of Santa Catarina and Paraná.

Although the pandemic officially ended in 2022, its analysis remains relevant in 2025, as the institutional, administrative, and political effects of this period continue to influence the State's ability to respond to crises and to apply resources in a comprehensive manner. In view of the health emergency and the exceptional flexibility of hiring provided for in Law 13,979/2020 (Brazil, 2020b), the study becomes even more pertinent because it examines the mechanisms of social accountability and the integrity of public management in emergency situations.

By identifying the nodes and flows of power that constituted the legal transparency network, this work provides tools to improve institutional practices, contributing to faster responses in future crises. Additionally, it remains aligned with SDG 16 (ONU, 2015c), which calls for effective, accountable and transparent institutions—permanent requirements for democratic strengthening and safeguards in high-pressure scenarios.

The following initial question was adopted for the research: which nodes and power dynamics were formed in the municipalities of Guaratuba, Matinhos and Paranaguá, in the state of Paraná, and in the municipalities of Joinville, Garuva, Itapoá, in the state of Santa Catarina, to provide legal transparency to the funds spent for combating the COVID-19 pandemic?

To answer this question, concepts of SNA were applied—especially those of nodes and edges—to identify the position of each actor in the relationships of the social dimension under observation. As a conceptual basis for the study, the following section presents a summary of the emergency regulation of public policies adopted to address the pandemic and the return flows generated by its implementation.

2 LITERATURE REVIEW

This section establishes the theoretical and conceptual foundation that defines the investigation on power dynamics and municipal public transparency in the context of health and administrative crisis. To this end, the following interconnected analytical pillars are described: *i*) transparency—as a constitutional and legal imperative; *ii*) conceptualization of territory, networks



and power dynamics—as lenses of analysis; and, *iii*) a gap identified in the literature that justifies the relevance of the current research.

2.1 Transparency and emergency regulation for public procurement during the COVID-19 pandemic

The Federal Constitution of Brazil, in accordance with SDG 3 (ONU, 2015b), provides for guiding principles and rules of competence aimed at the protection of public health, highlighting in its preamble the imperative for the Democratic State to guarantee the well-being of the community.

In this regard, health promotion is part of the nucleus of the State's goals, requiring the implementation of effective public policies. Among these responsibilities, the essential function of the Brazilian Unified Health System (SUS) stands out, as it oversees epidemiological surveillance actions, providing all the essential information to direct policies to combat the COVID-19 pandemic.

The Constitution expressly enshrined the principle of publicity as one of the indispensable vectors of public administration, attributing to it a central position in state management, to ensure wide dissemination of information to society. Consequently, except in unprecedented circumstances, it is the duty of the public authority to act with full transparency in the management of administrative matters, as established in the “caput” of article 37 and in items XXXIII and LXXII of article 5 of the Brazilian Constitution.

The right of access to information aims to ensure that citizens are aware of the data held by the State, allowing them to carry out so-called social accountability. Fundamentally, this access is manifested in two ways: through active transparency or passive transparency (Mazzei; Silveira, 2013).

Public transparency is the principle that guarantees access for interested parties not only to the information provided for by law or regulations, but also to any data that is of interest to the population. This practice contributes to strengthening trust and credibility between government administration and users of public services (Faraco, 2015).

To this effect, government websites were developed, in which the identity, objectives and actions of government bodies are presented, incorporating services and information, and making them available digitally. These environments facilitate the execution of administrative demands and broaden the population's access to the data necessary to identify their own needs (Pinho, 2008).

According to La Porte, Demchak and Jong (2002), the internet is an effective instrument for evaluating public organizations, as it allows information from management to be made available and reach its various stakeholders. This reach is beneficial, since it enables the rapid, comprehensive, and democratic dissemination of data, at a relatively low cost, contributing to the optimization of government budgets. On the other hand, Nazário, Silva and Rover (2012)



point out that the difficulty in locating and obtaining information, as well as the excessive steps required in this search, represent important limitations that need to be overcome by public transparency portals.

Therefore, the 2030 Agenda for Sustainable Development (ONU, 2015a. Our translation) reinforces that the success of public health policies—especially those aimed at combating a pandemic—depends directly on the principles established by SDG 16 (ONU, 2015c): “peace, justice, and effective institutions”. Among its targets, the requirement for transparent institutions, sensitive to social needs and also responsible for the use of public resources - essential elements for the effectiveness of actions in crisis scenarios - stand out.

This is justified because no public policy can be effectively implemented without continuous monitoring of its execution. Hence, monitoring is an essential stage of the cycle, defined as "a set of procedures for assessing the processes adopted, the preliminary and intermediate results obtained, and the behavior of the policy environment" (Rua, 2009, p. 104. Our translation); and it aims to simplify the execution of the proposed objectives. Ultimately, in the evaluation phase, several other procedures are carried out to judge the results of the policy (Rua, 2009).

The accountability of managers is then usually assessed in relation to the achievement of the goals and targets provided for in public policies. While combating the pandemic, it was carried out regarding more specifically regarding the allocation of resources received from other entities for this purpose and the efficiency and effectiveness of their use.

The obligation of accountability was underscored by the legislator when drafting Law 13,979/2020 (Brazil, 2020b), which provides for measures to address the emergency at issue and establishes, among other measures, a new and more flexible public procurement regime. The exemption from bidding for the acquisition of goods and services, including engineering, and inputs intended to combat a public health emergency of international scope resulting from the coronavirus was authorized.

However, the authorization for exemption from bidding was conditioned to explicit publication on the websites of public entities, not only with the purpose of enabling social accountability of public spending, but also to prevent waste, conflicts of interest and other deviations. Additionally, it empowers the monitoring of efforts to combat COVID-19.

It should be noted that paragraph 2 of article 4 of the aforementioned law expressly determined the immediate availability of data on all acquisitions or contracts on a specific official website on the worldwide web (internet). This information should include, if applicable, the name of the contractor, the number of its registration with the Federal Revenue of Brazil, term of contract, value, and the respective contracting or acquisition process, as well as the information provided for in paragraph 3 of article 8 of Law 12,527, of November 18, 2011 (Brazil, 2011).

Moreover, it is important to mention that the construction of transparency does not depend only on the availability of information, but also on its quality, so that it is understood by civil



society and enables the generation of accountability in public management (Nascimento, 2020).

2.2 Territory, social networks and power dynamics

The externalization of the symbolic universe that we have experienced during the pandemic represents nothing more than the very evidence of sedimentation and accumulation of knowledge, in which a society is built based on relational policies of internal and external asymmetrical flows, generated by the individuals who compose it. In other words, the legitimacy of the act and/or individual in society involves the necessary recognition of flows in the interest of the individual himself (Berger; Luckman, 2010).

Paraphrasing Norbert Elias (1998), in the book *Sobre o tempo* (Regarding Time, in English), these flow models, which include the return of elementary sequences, serve as standardized references that allow us to indirectly compare the sequences of the first succession of events. Or rather, when, for whatever reason, members of a society want to define positions, in time/power, to establish their present and future trajectories, they need a second succession of events.

This second succession—apropos a return—completes the initial generational cycle of a flow of collaborative activities called social networks. As a result, the study of these activities is based on the evaluation of the relation structures that connect individuals and reveal their behavioral interdependencies, thus constituting their social relations. Therefore, what is observed within a social network are the affinities between individuals and their attributes. These observations may be dependent on all other observations, due to social ties and traits that link them. Ergo, different statistical methods can be employed to analyze the data generated and, consequently, reveal the power networks and the actors that compose them (O'Malley; Onnela, 2014).

The importance of each of these actors within the network is established through the positioning of the other actors that form the relations in the production of the network itself. In other words, the control and influence over certain people and the territory are determined by the bonds of each actor and their position, defined in the relations. This is the basis for the development of power relations, in which territorialized actors produce daily flows and constitute networks to ensure control of the territory (Raffestin, 1993).

According to Marteleto (2001), network analysis is not an end, but rather the means to carry out structural research that makes it possible to demonstrate certain phenomena through their formalization. Therefore, the use of a relationship depends not only on the status and role of the actor, but also on the structural distribution of the ties established.

In this sense, social networks can be understood as symbolic structures of ties between social actors, which determine cultural and territorial limits and power relations, capable of imposing, through their disposition of affinities, political and economic concepts (Silva; Fialho; Saragoça, 2013). At their core, these networks express the notion of legitimation of power, in which A



somehow affects B and vice versa (Lukes, 1980). The study of these processes of legitimation allows us to identify whether there is a peculiar relationship between ideologies and actions of those in power on one hand, and attitudes, omissions, or beliefs of less influential groups on the other (Horochovski; Sirino, 2016).

However, according to Raffestin (1993), this configuration of power structured by the network—composed of fabrics and nodes—corresponds to the production of the territory itself. The three systems (surface, node and network) sustain the relations and the cohesion of territories, being constituted by actors—from the State to the individual—who act within defined limits, at different scales.

In this context, there is an intrinsic and inseparable relationship between network, power and territory, since power emanates from the population itself and is oriented to the control and domination of men and things in a given space. The recognition of this power in a territory depends on the gains and/or losses resulting from the flows of symmetrical or asymmetrical relations produced by the networks formed by the actors and individuals who are territorialized in it (Raffestin, 1993).

2.3 The gap in existing research

Although technical-scientific literature is abundant in studies on public transparency, governance, and social network analysis, there is a significant gap regarding the direct application of SNA to the legal framework and control mechanisms instituted by Law 13,979/2020 (Brazil, 2020b), prepared in response to the pandemic. Most of the studies focus on the quality of information (Nazário; Silva; Rover, 2012), in general regulations or in geographical areas that do not allow direct comparisons.

Thus, the current study, by delimiting a network of nodes and flows of power in a context of crisis (COVID-19), with a specific territorial cut of two Brazilian states—Paraná and Santa Catarina—and using Gephi software (Bastian; Heymann; Jacomy, 2009) to measure the centrality of actors in the legal transparency of resources, demonstrates, in a groundbreaking manner, the institutional design of accountability in times of exception. This approach contributes to filling this gap by directing the analysis to the power structure instituted by emergency legislation, instead of being limited to general financial data or the perceptions of society in a given period.

3 METHODOLOGY

Initially, for the implementation of the research, the area of study was delimited, taking into account the following three criteria: *i*) emphasis on a territory that was within the space experienced by the authors of the research; *ii*) selection of six municipalities – three from one state and three from another, in order to obtain possible variations in the results; and search for municipalities that belonged, in the respective state, to the same Immediate

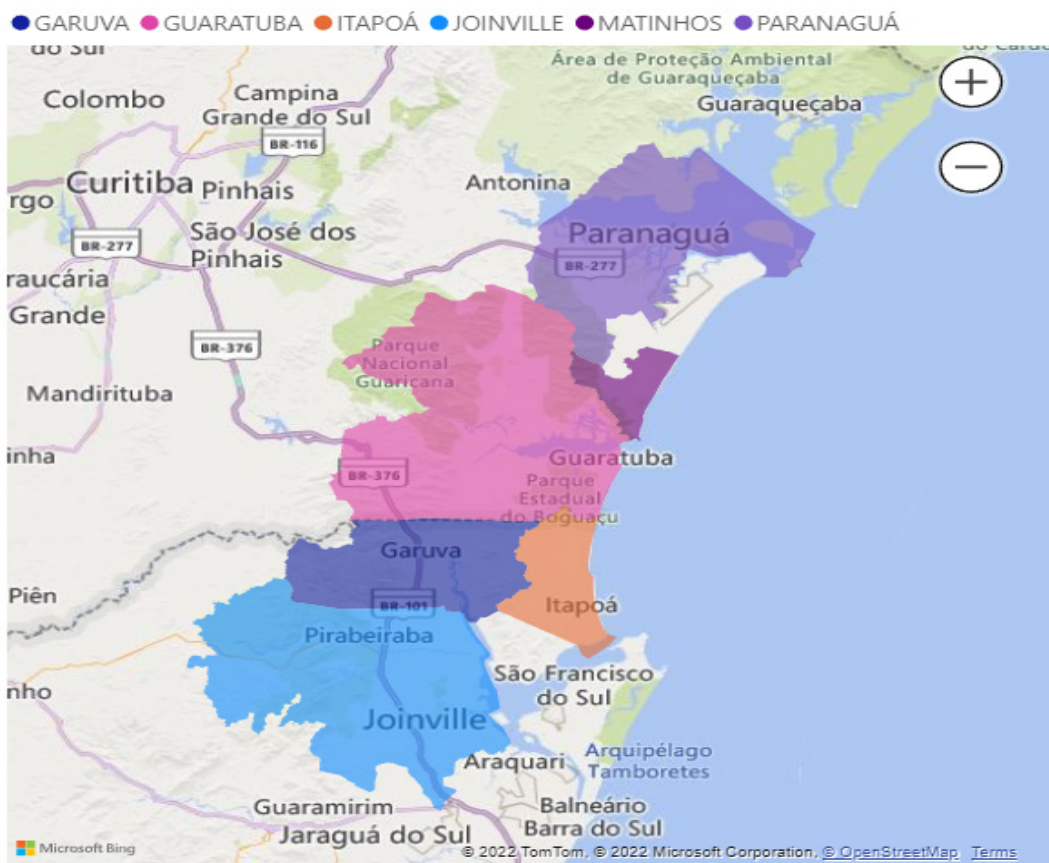


Geographic Region (RGI, in its acronym in Portuguese), under the terms defined by the Brazilian Institute of Geography and Statistics (IBGE, in its acronym in Portuguese), among which was the municipality of reference.

An RGI corresponds to a territorial division within Brazil that brings together nearby municipalities, articulated by relationships referring to everyday life. It is the smallest unit in the country's regional division, which also comprises the intermediate geographic regions and the major regions—North, Northeast, South, Southeast, and Midwest.

The municipalities chosen in Paraná were Paranaguá, Matinhos and Guaratuba, which are part of the RGI of Paranaguá and have an estimated population of 231,057 inhabitants, according to the Profile of Municipalities, of the Paraná Institute of Economic and Social Development – IparDES (IparDES, 2022). The municipalities selected in Santa Catarina were Joinville, Garuva and Itapoá, belonging to the RGI of Joinville, with an estimated population of 645,290 inhabitants (IparDES, 2022).

Figure 1 – Map of Municipalities studied in the RGIs of Joinville and Paranaguá



Source: prepared by the authors, based on the methodological criteria defined in the study.



Next, the study was divided into two stages. The first stage focused on the collection of data that made it possible to identify the most distant origin of financial resources received by the municipalities surveyed, for which data mining was used on the official websites of each location. The second stage focused on tracking the actors legally responsible for ensuring the transparency of expenditures made with these resources.

It is important to mention that the result of the first stage was not the final objective of the study. However, this effort was necessary to delimit the extent of the network and, consequently, to identify its composition; that is, the actors that comprise it.

In the second stage, a systematic scan was performed in the legislation of the entities that transferred and received the funds. This procedure made it possible to identify the organizations responsible for transparency and those responsible for monitoring. Based on Federal Law 13,979/2020 (Brazil, 2020b), it was possible to map, within the scope of the Executive Branch, the main actors that composed, from the most remote origin, the structure of legal transparency associated with the expenses intended to combat COVID-19 in the municipalities benefiting from these transfers.

Finally, with the use of Gephi software (Bastian; Heymann; Jacomy, 2009), through the centrality function, a structural analysis of the legal transparency network was generated, making it possible to discern the hierarchical organization of the nodes.

The main methodological limitation of the current study lies in the fact that the SNA employed was restricted to mapping the formal and legal structure of transparency and oversight established by Federal Law 13,979/2020 (Brazil, 2020b) and by the preexisting control frameworks. The quality or effectiveness of the information on the network was not evaluated—for example, the usability of the websites by citizens – nor was it verified whether the interaction between the nodes occurred, in effect, in the prescribed manner. The investigation was limited to the power network outlined by the emergency regulation.

Applying SNA to the emergency legal framework of COVID-19 functioned as a kind of institutional x-ray. It revealed not a practical use of the information, but the legal structure that defined who had formal power to ensure transparency and perform oversight of resources in an unusual administrative scenario.

4 RESULTS AND DISCUSSION

This section presents the main results and findings of the research, divided into two central stages: quantification and flow of transferred resources; and analysis of the legal and hierarchical structure of transparency actors.



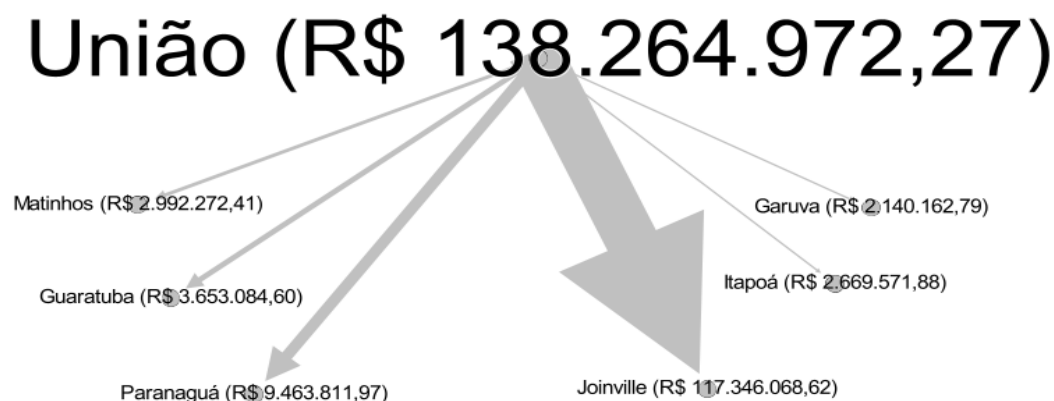
4.1 Quantification and flow of resources

In the first stage, the mining of data from the transparency websites of each of the municipalities analyzed resulted in evidence that all of them received resources from the Federal Government.

Through the analysis of the data available on the CGU Transparency Portal (Brazil, 2020a), under the heading “Resources transferred to combat the pandemic (COVID-19)”, it was possible to quantify the total resources transferred and, consequently, the total received by each municipality in the period between 1/1/2020 and 8/16/2022. The nominal amount, evidenced and allocated to the municipalities surveyed, totaled BRL 138,264,972.27 (one hundred and thirty-eight million, two hundred and sixty-four thousand, nine hundred and seventy-two Brazilian reals and twenty-seven cents).

Figure 2 shows the actors—from origin (Federal Government) to destination (municipalities)—that constituted the flow of resources. The thickness of the graph (edge) used in the image is proportional to the resources sent and received by each entity.

Figure 2 – Resources transferred from the Federal Government (“União”) to the municipalities in study to combat the pandemic (COVID-19)



Source: prepared by the authors, based on data from the CGU Transparency Portal (Brazil, 2020a) and using Gephi (Bastian; Heymann; Jacomy, 2009), and then adapted.

4.2 Analysis of the network structure and hierarchy of actors

In the second stage, the legal basis that supported expenditure transparency was analyzed, combining it with the result previously obtained on the financial flow. According to Silveira and Farina (2012), the greater the centrality of a given actor, the more intense the flow of



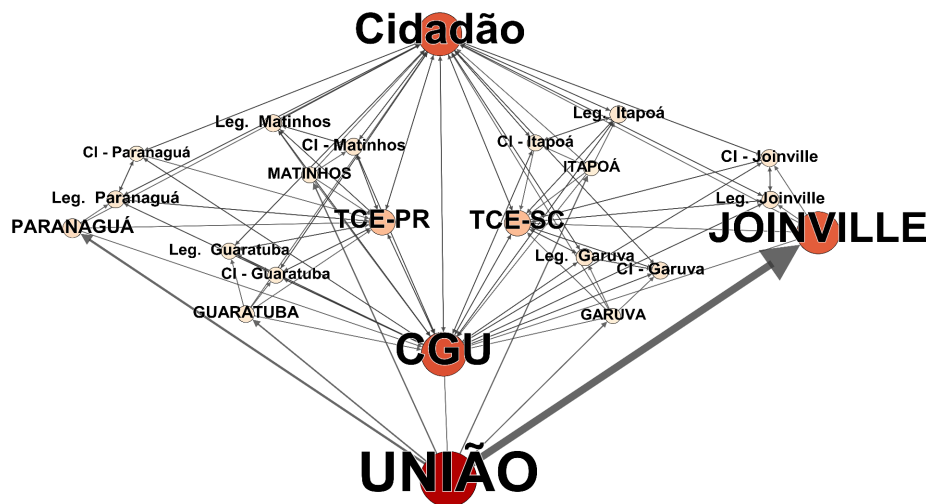
information transacted by it tends to be, which facilitates access to data by the actors connected to it. Conversely, the lower the degree of centrality, the greater the difficulties for information to circulate through this actor on the network.

Therefore, considering that the level of centrality of an actor derives from the position occupied by it within the network, the use of Gephi (Bastian; Heymann; Jacomy, 2009) made it possible to identify two nodes—CGU and Citizens—that were linked to all the other actors with a high level of centrality. On the other hand, two other nodes – the Court of Accounts of the State of Paraná (TCE-PR) and the Court of Accounts of the State of Santa Catarina (TCE-SC) – presented links only with a specific group of actors, allowing us to conclude that their level of centrality was medium. Finally, the remaining nodes, which had few connections with other actors in the network, revealed a low level of centrality.

The study showed that Law 13,979/2020 (Brazil, 2020b), added to the legal framework that underpins the principle of transparency for federal resources—especially Law 13,844, of June 18, 2019 (Brazil, 2019), assigned to the central internal control body of the federal Executive Branch the responsibility of adopting measures aimed at increasing the transparency and integrity of public management within the Federal Government. Consequently, the legal transparency of federal resources destined to combat COVID-19, both in the municipalities surveyed and on a national level, became the responsibility of this control authority—the central node of the relational flow.

Figure 3 graphically represents the legally imposed structure, revealing, through centrality analysis, the hierarchical ordering of actors. It clearly demonstrates that power flows characterized by the polarization of control between the node of the citizens— “Cidadão”— and the node of the CGU—a node of high centrality, as it is the actor with federal responsibility for legal transparency and is interconnected with all the other actors in the network.

Figure 3 – Analysis of the centrality of actors in the transparency network



Source: prepared by the authors, based on data from the CGU Transparency Portal (Brazil, 2020a) and using Gephi (Bastian; Heymann; Jacomy, 2009), and then adapted.



Within the scope of the entities receiving the resources, that is, the municipalities, similar standardization was evident in the regulations. In all six municipalities surveyed, it was consistently found that the internal control body is responsible for ensuring transparency regarding the distribution of the resources received and the procedures adopted in their use.

In the municipality of Joinville, transparency is supported by Ordinary Law 5,045, of June 30, 2004 (Santa Catarina, 2004), which attributed to the municipal internal control system access to information related to the use of resources and the actions of the Executive. Among its essential objectives, the system includes the promotion of good management of public resources, aiming mainly at transparency, in adherence to the principles established by the Federal Constitution.

Also in the state of Santa Catarina, the municipalities of Garuva and Itapoá were directed, respectively, by Ordinary Law 1,247, of December 13, 2005 (Santa Catarina, 2005b), and Complementary Law 9, of August 19, 2005 (Santa Catarina, 2005a), both delegating access to the aforementioned information to the respective municipal internal control systems, with the same objectives previously described.

Similarly, the three municipalities of Paraná—Paranaguá, Guaratuba, and Matinhos—were governed, respectively, by Complementary Law 192, of December 13, 2016 (Paraná, 2016), by Ordinary Law 1,264, of February 21, 2007 (Paraná, 2007), and by Ordinary Law 1,531, of April 10, 2012 (Paraná, 2012), providing their internal control systems with the responsibility of ensuring compliance with current internal and external rules and regulations. This responsibility includes revenue collection, expenditure, and observance of the functional conduct of public agents, contributing to institutional integrity and the fulfillment of the fiscal goals established for the period in reference.

It was also evidenced that all the nodes listed are part of internal control systems, that is, the process is conducted by the administrative structure. However, the analysis of legislation revealed that the promotion of transparency is not limited to these internal mechanisms but also involves external actors. In this sense, the Federal Constitution, in article 31, establishes the municipal Legislative Branch as responsible for the external control of the acts of the Executive Branch and that the municipal council will perform this function with the assistance of the court of accounts of the respective state. Therefore, the network now includes the following legally established external control nodes: TCE-SC – Complementary Law 202, of December 15, 2000 (Santa Catarina, 2000) and TCE-PR – Complementary Law 113, of December 15, 2005 (Paraná, 2005). These agencies produce intermediate flows, since their primary flows cover all nodes of the territory of each state. Nevertheless, considering that the study considers resources from the Federal Government, it was evident that the flow of these nodes transcends its initial sphere, and reaches the node represented by the CGU.

Finally, the credibility of a network focused on transparency depends on whether the information released represents the reality experienced, according to Vishwanath and Kaufmann (1999), as it passes through the legitimation sieve of the “Citizen” actor. This is corroborated by Santos (2012), when he asserts that transparency and social participation are inseparable, interdependent and interchangeable concepts, and that transparency, through



the concept of accountability, becomes a powerful instrument of social participation. For this reason, the target audience for the exercise of transparency is the citizen. This is exactly what the present study identified, that is, that the “Citizen” node is the central target of flow generation of all the legal bases that form the nodes of the network that aim at transparency.

As a result, the main actors integrating the network of nodes and flows of power constituted in the municipalities of Joinville, Garuva, and Itapoá, in the state of Santa Catarina, and of Guaratuba, Matinhos, and Paranaguá, in the state of Paraná, were identified. These entities formed the structure responsible for the legal transparency of the resources used to combat the COVID-19 pandemic.

5 FINAL CONSIDERATIONS

The contribution of this work consisted of making feasible the timely support of society and audit institutions together with the provision of supplementary information so that the State becomes progressively more competent and effective. Therefore, we seek to strengthen the culture of probity in public interests’ management and encourage the continuous improvement of government policies.

The importance of the research and its contemporaneity are based on the pillar of effective accountability of public spending, in a clear and precise manner, to the citizen, especially in the context of a reality aggravated by a multifaceted pandemic that generated an unprecedented health crisis. It inexorably binds the current constitutional precepts, as well as targets 16.6 and 16.10 of the SDGs, which are based on promoting peaceful and inclusive societies, providing access to justice for all and building effective, accountable and inclusive institutions at all levels of action.

It was evident in the study that, although the municipalities surveyed have benefited from a significant contribution of more than BRL138 million, through direct transfer, no innovative public policy node was added to the inspection and transparency network of these municipalities. The legislature limited itself to determining the immediate availability of contracts on an official website, which is nothing new, since such prerequisites have long been part of the list of requirements of good transparency and consequent accountability.

In response to the research question about the nodes and flows of power formed in the selected municipalities, the study confirms that the legal transparency network for transferred federal resources did not establish new oversight nodes but rather reinforced the flow of information directed at the “Citizen” node, which is the central target and legitimizer of the network.

The power nodes within legal transparency identified were classified into the following measures of centrality in the network.

High centrality nodes—“CGU” and “Citizen” were identified as nodes of high centrality—nodes interconnected (linked) to all the other actors in the analyzed network, giving them broad



centrality. The CGU is the relational node of federal responsibility for legal transparency, exercising federal oversight within the Executive Branch. The Citizen, on the other hand, is the final address of the information and the actor who performs social accountability, being the main target of the network, to which all legal bases seek to generate flow.

Medium centrality nodes – the state courts of accounts (TCE-PR and TCE-SC) are considered nodes of medium centrality, responsible for the state external authority. They presented connections only with an exclusive group of actors, from which their medium level of centrality derived. Article 31 of the Brazilian Federal Constitution provides that the municipal Legislative Power, in the exercise of external control, will have the support of the court of accounts of the respective state. Although the TCE-SC and TCE-PR present intermediate flows, in the case of Federal Government resources, it was evident that the flow of these nodes transcends their primary limits, reaching the "CGU" node.

Low-centrality/internal nodes—the internal control instruments and the Legislative Powers of the six municipalities studied were classified as low centrality/internal nodes. These nodes provided few connections with the other actors in the network and were given a low level of centrality. Its processes are transported by the municipal administrative structure itself, being part of the internal control systems. In the municipalities, the internal audit institutions are responsible for informing how the funds received were spent. The municipal Legislative Branch is established as the external node for the inspection of the acts of the municipal Executive.

As a result, it was observed that the power dynamics in this network is characterized by the polarization of control between the “Citizen” node and the CGU, which use the channels and control systems already existing in the federative entities to account for emergency resources.

The network’s framework, marked by the high centrality of the “CGU” and “Citizen” nodes, is not random. It is a direct reflection of the institutional design imposed by Law 13,979/2020 (Brazil, 2020b), which, by making the contracting regime more flexible during the pandemic period, required, in counterbalance, a vertical and immediate mechanism of power dynamics to ensure the accountability of the federal resources transferred. In this emergency context, the network is placed as a system circumscribed by fabrics and nodes (Raffestin, 1993), in which the Office of the Comptroller General, by holding the responsibility for increasing transparency within the federal Executive Branch, acts as primary control actor, producing asymmetrical internal and external flows, in the oversight of the expenses of the municipal territories (Raffestin, 1993).

The polarization of power dynamics between the “CGU” and the “Citizen” is directly aligned with the concept of social accountability (Smulovitz; Peruzzotti, 2000). In a time of crisis, in which the possible inefficiency of municipal internal control is evidenced by the low centrality, the mechanism of legal seeks to ensure that the “Citizen” node—the target audience and legitimator of transparency – can exercise direct social accountability. Hence, the high level of centrality of the citizen reinforces Lukes’ (1980) notion of power, for whom total openness of information seeks to enable the citizen to affect, in some way, the actions or inactions of



managers, establishing an intelligible contribution for the debate on normative criteria and distribution of authority.

In view of upcoming new research, the study presented needs deepening and expanding, especially regarding the application of social network analysis in the transparency of public spending to face the pandemic. It is recommended to include municipalities from other states of the Federation to expand the universe investigated and allow more robust comparisons.

Lastly, it is suggested that network analysis be applied directly to expenditure sources, making it possible to obtain objective, clear and simple information—an essential condition for the adequate exercise of social accountability. Such an approach might reveal, with greater precision, the true dimension of the effectiveness, or lack thereof, of the network represented here.

REFERÊNCIAS

AMENT, Judith M.; FREEMAN, Robin; CARBONE, Chris; VASSALL, Anna; WATTS, Charlotte. An empirical analysis of synergies and tradeoffs between sustainable development goals. **Sustainability**, v. 12, n. 20, p. 8.424, Oct. 2020. DOI: <https://doi.org/10.3390/su12208424>. Available at: <https://www.mdpi.com/2071-1050/12/20/8424>. Consulted on: Sep. 14, 2022.

BASTIAN, Mathieu; HEYMANN, Sebastien; JACOMY, Mathieu. Gephi: an open source software for exploring and manipulating networks. **Proceedings of the International AAAI Conference on Web and Social Media**, Palo Alto, v. 3, n. 1, pp. 361-362, Mar. 2009. DOI: <https://doi.org/10.1609/icwsm.v3i1.13937>. Available at: <https://ojs.aaai.org/index.php/ICWSM/article/view/13937>. Consulted on: Sep. 14, 2022.

BERGER, Peter L.; LUCKMAN, Thomas. **A construção social da realidade**: tratado de sociologia do conhecimento. 28. ed. Petrópolis: Vozes, 2010.

BRAZIL. [Constituição Federal (1988)]. **Constituição da República Federativa do Brasil de 1988**. Brasília, DF: Presidência da República, 1988. Available at: https://www.planalto.gov.br/ccivil_03/Constituicao/Constituicao.htm. Consulted on: Sep. 14, 2022.

BRAZIL. Controladoria-Geral da União. Transferências no combate ao Coronavírus/ Portal da Transparência. **Gov.br**, Brasília, March 26, 2020a. Transferências no combate ao Coronavírus. Available at: <https://www.portaltransparencia.gov.br/coronavirus/transferencias?ordenarPor=meseAno&direcao=desc>. Consulted on: Aug. 16, 2022.

BRAZIL. Instituto Brasileiro de Geografia e Estatística. **Estimativas de população. Gov.br**, Brasília, 28 de agosto de 2025. População. Available at: <https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativas-de-populacao.html>. Consulted on: Sep. 14, 2022.

BRAZIL. **Lei n. 12.527, de 18 de novembro de 2011**. Regula o acesso a informações previsto no inciso XXXIII do art. 5º, no inciso II do § 3º do art. 37 e no § 2º do art. 216 da Constituição



federal; altera a Lei nº 8.112, de 11 de dezembro de 1990; revoga a Lei nº 11.111, de 5 de maio de 2005, e dispositivos da Lei nº 8.159, de 8 de janeiro de 1991; e dá outras providências. Brasília, DF: Presidência da República, 2011. Available at: https://www.planalto.gov.br/ccivil_03/ato2011-2014/2011/lei/112527.htm. Consulted on: Sep. 14, 2022.

BRAZIL. **Lei n. 13.844, de 18 de junho de 2019.** Estabelece a organização básica dos órgãos da Presidência da República e dos Ministérios; altera as Leis nºs 13.334, de 13 de setembro de 2016, 9.069, de 29 de junho de 1995, 11.457, de 16 de março de 2007, 9.984, de 17 de julho de 2000, 9.433, de 8 de janeiro de 1997, 8.001, de 13 de março de 1990, 11.952, de 25 de junho de 2009, 10.559, de 13 de novembro de 2002, 11.440, de 29 de dezembro de 2006, 9.613, de 3 de março de 1998, 11.473, de 10 de maio de 2007, e 13.346, de 10 de outubro de 2016; e revoga dispositivos das Leis nºs 10.233, de 5 de junho de 2001, e 11.284, de 2 de março de 2006, e a Lei 13.502, de 1º de novembro de 2017. Brasília, DF: Presidência da República, 2019. Available at: https://www.planalto.gov.br/ccivil_03/Ato2019-2022/2019/Lei/L13844compilado.htm. Consulted on: Sep. 14, 2022.

BRAZIL. **Lei n. 13.979, de 6 de fevereiro de 2020.** Dispõe sobre as medidas para enfrentamento da emergência de saúde pública de importância internacional decorrente do coronavírus responsável pelo surto de 2019. Brasília, DF: Presidência da República, 2020b. Available at: https://www.planalto.gov.br/ccivil_03/Ato2019-2022/2020/Lei/L13979.htm. Consulted on: Sep. 14, 2022.

ELIAS, Norbert. **Sobre o tempo.** Tradução de Vera Ribeiro. Rio de Janeiro: Zahar, 1998.

FARACO, Bruno Pereira. **Transparência das informações públicas nos portais das instituições federais de educação profissional da Região Sul do Brasil.** 2015. Dissertação (Mestrado em Engenharia Civil) – Universidade Tecnológica Federal do Paraná, Curitiba, PR, 2015. Available at: <http://repositorio.utfpr.edu.br/jspui/handle/1/1630>. Consulted on: Jun. 20, 2022.

HOROCHOVSKI, Rodrigo Rossi; SIRINO, Nárika Paola. Sentidos e usos do empoderamento na pesquisa social. In: PERISSINOTTO, Renato Monseff; LACERDA, Gustavo Biscaia de; SZWAKO, José Leon (org.). **Curso livre de teoria política: normatividade e empiria.** Curitiba: Appris, 2016. pp. 249-271.

INSTITUTO PARANAENSE DE DESENVOLVIMENTO ECONÔMICO E SOCIAL. Perfil dos municípios. **PR.Gov.br**, Paraná, 2022. Ipardes. Available at: <https://www.ipardes.pr.gov.br/Pagina/Perfil-dos-municipios-0>. Consulted on: Sep. 14, 2022.

LA PORTE, Todd M.; DEMCHAK, Chris C.; JONG, Martin de. Democracy and bureaucracy in the age of the web: empirical findings and theoretical speculations. **Administration & Society**, v. 34, n. 4, pp. 411-446, Sep. 2002. DOI: <https://doi.org/10.1177/009539970203400400>. Available at: <https://journals.sagepub.com/doi/10.1177/0095399702034004004>. Consulted on: Sep. 14, 2022.

LUKES, Steven. **O poder: uma visão radical.** Brasília: Editora Universidade de Brasília, 1980.



MARTELETO, Regina Maria. Análise de redes sociais: aplicação nos estudos de transferência da informação. **Ciência da Informação**, Brasília, v. 30, n. 1, pp. 71-81, Jan./Apr. 2001. DOI: <https://doi.org/10.1590/S0100-19652001000100009>. Available at: <https://www.scielo.br/j/ci/a/6Y7Dyj4cVd5jdRkXJVxhxqN/abstract/?lang=pt>. Consulted on: Sep. 14, 2022.

MAZZEI, Marcelo Rodrigues; SILVEIRA, Sebastião Sérgio da. O direito de acesso à informação pública como instrumento de controle social da administração pública. In: Congresso Nacional da Federação de Pós-Graduandos em Direito, 2., 2013, São Paulo. **Anais** [...]. São Paulo: Pontifícia Universidade Católica de São Paulo, 2013. pp. 219-224. Available at: <http://www.publicadireito.com.br/artigos/?cod=b1da5960a28a9deb>. Consulted on: Sep. 22, 2022.

NASCIMENTO, Pedro. Transparência nos municípios brasileiros: uma análise do fator desenvolvimento. **Revista da CGU**, Brasília, v. 12, n. 21, pp. 100-113, Jan./Jun. 2020. DOI: <https://doi.org/10.36428/revistadacgu.v12i21.182>. Available at: https://revista.cgu.gov.br/Revista_da_CGU/article/view/182. Consulted on: Sep. 14, 2022.

NAZÁRIO, Débora Cabral; SILVA, Paulo Fernando da; ROVER, Aires José. Avaliação da qualidade da informação disponibilizada no Portal da Transparência do Governo Federal. **Revista Democracia Digital e Governo Eletrônico**, Florianópolis, v. 1, n. 6, pp. 180-199, Jun. 2012. Available at: <https://www.researchgate.net/publication/275025128>. Consulted on: Jun. 20, 2022.

O'MALLEY, A. James; ONNELA, Jukka-Pekka. Topics in social network analysis and network science. **Physics and Society**, Apr. 2014. DOI: <https://doi.org/10.48550/arXiv.1404.0067>. Available at: <https://arxiv.org/abs/1404.0067>. Consulted on: Aug. 02, 2022.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. Agenda 2030 para o Desenvolvimento Sustentável. **ONU Brazil**, Brasília, 2015a. Publicações. Available at: <https://brasil.un.org/pt-br/91863-agenda-2030-para-o-desenvolvimento-sustentavel>. Consulted on: Aug. 14, 2022.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. Objetivo 3: assegurar uma vida saudável e promover o bem-estar para todos, em todas as idades. Brasília: **ONU Brazil**, 2015b. Available at: <https://brasil.un.org/pt-br/sdgs/3>. Consulted on: Dec. 06, 2022.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. Objetivo 16: promover sociedades pacíficas e inclusivas para o desenvolvimento sustentável, proporcionar o acesso à justiça para todos e construir instituições eficazes, responsáveis e inclusivas em todos os níveis. Brasília: **ONU Brazil**, 2015c. Available at: <https://brasil.un.org/pt-br/sdgs/16>. Consulted on: Dec. 06, 2022.

PARANÁ. **Lei complementar n. 192, de 13 de dezembro de 2016**. Dispõe sobre a reorganização administrativa do Poder Executivo do município de Paranaguá e dá outras providências. Paranaguá, PR: Câmara Municipal de Paranaguá, 2016. Available at: <https://leismunicipais.com.br/a1/pr/p/paranagua/lei-complementar/2016/20/192/lei-complementar-n-192-2016-dispoe-sobre-a-reorganizacao-administrativa-do-poder-executivo-do-municipio-de-paranagua-e-da-outras-providencias?q=192>. Consulted on: Sep. 14, 2022.



PARANÁ. **Lei ordinária n. 1.264, de 21 de fevereiro de 2007.** Dispõe sobre o sistema de controle interno municipal, nos termos do art. 31 da Constituição federal e do art. 59 da Lei complementar 101/2000, cria a Unidade de Controle Interno do Município de Guaratuba e dá outras providências. Guaratuba, PR: Câmara Municipal de Guaratuba, 2007. Available at: <https://www.camaraguaratuba.pr.gov.br/pdfs/01264.pdf>. Consulted on: Sep. 14, 2022.

PARANÁ. **Lei ordinária n. 1.531, de 10 de abril de 2012.** Dispõe sobre o sistema de controle interno municipal, nos termos do art. 31 da Constituição federal e do art. 59 da Lei complementar 101/2000, revoga a Lei 1.518/2011 e dá outras providências. Matinhos, PR: Câmara Municipal de Matinhos, 2012. Available at: <https://leismunicipais.com.br/a1/pr/m/matinhos/lei-ordinaria/2012/154/1531/lei-ordinaria-n-1531-2012-dispoe-sobre-o-sistema-de-controle-interno-municipal-nos-termos-do-artigo-31-da-constituicao-federal-e-do-artigo-59-da-lei-complementar-n-101-2000-revoga-a-lei-n-1518-2011-e-da-outras-providencias?q=1531>. Consulted on: Sep. 14, 2022.

PARANÁ. Tribunal de Contas do Estado do Paraná. **Lei Complementar n. 113, de 15 de dezembro de 2005.** Dispõe sobre a Lei Orgânica do Tribunal de Contas do Estado do Paraná. Curitiba, PR: TCE-PR, 2005. Available at: <https://leisestaduais.com.br/pr/lei-complementar-n-113-2005-parana-dispoe-sobre-a-lei-organica-do-tribunal-de-contas-do-estado-do-parana>. Consulted on: Sep. 14, 2022.

PINHO, José Antonio Gomes de. Investigando portais de governo eletrônico de estados no Brasil: muita tecnologia, pouca democracia. **Revista de Administração Pública**, Rio de Janeiro, v. 42, n. 3, pp. 471-493, May/Jun. 2008. DOI: <https://doi.org/10.1590/S0034-76122008000300003>. Available at: <https://www.scielo.br/j/rap/a/j8dGWgrkM8KVBwm5gzXhSjr/?format=html&lang=pt> Consulted on: Aug. 02, 2022.

RAFFESTIN, Claude. **Por uma geografia do poder.** Translation by Maria Cecília França. São Paulo: Ática, 1993.

RUA, Maria das Graças. **Políticas públicas.** Florianópolis: Departamento de Ciências da Administração; Brasília: Capes: 2009.

SANTA CATARINA. **Lei Complementar n. 9, de 19 de agosto de 2005.** Institui o sistema de controle interno no município de Itapoá e dá outras providências. Itapoá, SC: Câmara Municipal de Itapoá, 2005a. Available at: <https://sapl.itapoa.sc.leg.br/ta/289/text?>. Consulted on: Sep. 14, 2022.

SANTA CATARINA. **Lei Ordinária n. 1.247, de 13 de dezembro de 2005.** Institui no município de Garuva o sistema de controle interno, nos termos do art. 31 da Constituição federal e dá outras providências. Garuva, SC: Câmara Municipal de Garuva, 2005b. Available at: <https://www.camaragaruva.sc.gov.br/proposicoes/pesquisa/0/1/0/1631>. Consulted on: Sep. 14, 2022.

SANTA CATARINA. **Lei n. 5.045, de 30 de junho de 2004.** Institui o sistema de controle interno no Poder Executivo municipal e dá outras providências. Joinville, SC: Prefeitura Municipal de Joinville, 2004. Available at: <https://leis.org/prefeitura/sc/joinville/lei/lei->



[ordinaria/2004/5045/lei-ordinaria-n-5045-2004-institui-o-sistema-de-controle-interno-no-poder-executivo-municipal-e-da-outras-providencias?termo=5.045](#). Consulted on: Sep. 14, 2022.

SANTA CATARINA. Tribunal de Contas do Estado de Santa Catarina. **Lei Complementar n. 202**, de 15 de dezembro de 2000. Institui a Lei Orgânica do Tribunal de Contas do Estado de Santa Catarina e adota outras providências. Florianópolis, SC: TCE-SC, 2000. Available at: https://www.tcesc.tc.br/files/file/biblioteca/LEI_ORGANICA_CONSOLIDADA.pdf. Consulted on: Sep. 14, 2022.

SANTOS, José Luiz Lins dos. Transparência regulatória e controle social. In: PROENÇA, Jadir Dias; PAULO, Carla Beatriz de (org.). **Experiências exitosas em regulação na América Latina e Caribe**. Brasília: Presidência da República, 2012. Available at: https://www.gov.br/casacivil/pt-br/conteudo-de-regulacao/regulacao/documentos/biblioteca-nacional/2012/11662_diamond-revista_miolo_1.pdf. Consulted on: Aug. 03, 2022.

SILVA, Carlos Alberto da; FIALHO, Joaquim; SARAGOÇA, José. Análise de redes sociais e sociologia da acção: pressupostos teórico-metodológicos. **Revista Angolana de Sociologia**, Ramada, n. 11, pp. 91-106, 2013. DOI: <https://doi.org/10.4000/ras.361>. Available at: <https://journals.openedition.org/ras/361>. Consulted on: Aug. 02, 2022.

SILVEIRA, Marco Antonio Pinheiro da; FARINA, Milton Carlos. Análise de redes sociais como ferramenta que contribui para a melhoria das relações entre empresas participantes de um APL de eventos. **Redes**, Santa Cruz do Sul, v. 17, n. 1, pp. 33-54, Jan./Apr. 2012. DOI: <https://doi.org/10.17058/redes.v17i1.2384>. Available at: <https://seer.unisc.br/index.php/redes/article/view/2384>. Consulted on: Aug. 02, 2022.

SMULOVITZ, Catalina; PERUZZOTTI, Enrique. Societal accountability in Latin America. **Journal of Democracy**, v. 11, n. 4, pp. 147-158, Oct. 2000. DOI: <https://doi.org/10.1353/jod.2000.0087>. Available at: https://www.researchgate.net/publication/236706264_Social_Accountability_in_Latin_America. Consulted on: Jun. 20, 2022.

VISHWANATH, Tara; KAUFMANN, Daniel. Towards transparency in finance and governance. **SSRN Electronic Journal**, Sep. 1999. DOI: <http://dx.doi.org/10.2139/ssrn.258978>. Available at: <https://papers.ssrn.com/abstract=258978>. Consulted on: Jun. 20, 2022.