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Information asymmetry in the hospital budget process: Effects of agency problems on the technical efficiency and quality of provided services

Assimetria informacional no processo orçamentário hospitalar: reflexos dos problemas de agência sobre a eficiência técnica e a qualidade dos serviços prestados

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Keywords
Informational asymmetry.
Budgeting process.
Technical efficiency.
Quality.
Hospital.

Abstract

The study looks at the dichotomy between Technical Efficiency and Quality in the provision of hospital services, placing Informational Asymmetry within the Budget Process as an interactive part of this relationship in order to explain the behavior of both performance measures. The goal is therefore to analyze the effects that information asymmetries in the budget process exert on the Technical Efficiency and Quality of services performed in hospitals funded by public resources. The research strategy employed was a multiple case study, investigating two hospitals in Brazil's South Region: one public and one nonprofit private. Three data collection techniques were used: direct observation, semi-structured interviews, and documentary analysis. As to analyzing the obtained data, content analysis using thematic topics was the adopted technique. Results indicate that Information Asymmetry in the Budget Process between the state and the hospitals, respectively Principal and Agents, when related to the budget planning stage, results in harmful effects for Technical Efficiency and beneficial ones for Quality; however, when related to a lack of financial alignment in the budget execution stage, that information asymmetry results in opposite effects, i.e., favorable for Technical Efficiency and harmful for Quality. The study's conclusions contribute to extant discussions on the dichotomy between Technical Efficiency and Quality in services performed in hospital contexts, analyzing this phenomenon through the effects that Information Asymmetry in the Budget Process exerts on both performance measures.

Palavras-chave
Assimetria informacional.
Processo orçamentário.
Eficiência técnica.
Qualidade.
Hospital.

Resumo

O estudo aborda a dicotomia entre eficiência técnica e qualidade na prestação de serviços hospitalares, inserindo a assimetria informacional no processo orçamentário como um elemento interativo dessa relação para explicar o comportamento de ambas medidas de desempenho. Assim, o objetivo é analisar os efeitos que as assimetrias informacionais no processo orçamentário exercem sobre a eficiência técnica e a qualidade dos serviços realizados em hospitais financiados por recursos públicos. A estratégia de pesquisa abordada foi o estudo de casos múltiplos, sendo investigados dois hospitais da região sul do Brasil: um público e um privado sem fins lucrativos. Foram aplicadas três técnicas para a coleta dos dados: observação direta, entrevistas semiestruturadas e análise documental. Quanto à análise dos dados obtidos, foi aplicada a técnica de análise de conteúdo por temática eixo. Os resultados da pesquisa indicam que a assimetria informacional no processo orçamentário, entre o Estado e os hospitais, respectivamente principal e agentes, quando relacionada com a etapa de planejamento orçamentário, resulta em efeitos prejudiciais para a eficiência técnica e benéficos para a qualidade, porém, quando relacionada com a ausência de alinhamento financeiro na etapa de execução orçamentária, resulta em efeitos contrários, favoráveis para a eficiência técnica e nocivos para a qualidade. As conclusões do estudo contribuem com as discussões existentes acerca da dicotomia entre eficiência técnica e qualidade em serviços no contexto hospitalar, analisando esse fenômeno por meio dos reflexos que a assimetria informacional no processo orçamentário exerce sobre ambas medidas de desempenho.

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Practical implications

The results can help publicly funded hospital institutions in managing budget information, by providing insights into the effects of information asymmetry in budgeting. Results can also be useful in budget decision-making related to organizational performance in healthcare.

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1 INTRODUCTION

A significant part of Brazilian public services is performed in the health sector, whose funding, under Brazil's Federal Constitution of 1988, is the responsibility of the state (Constituição, 1988). It is the Unified Healthcare System (SUS), one of the world's largest and most complex public healthcare systems, which funds services in both public and private non-profit hospitals. Such healthcare is universal, free, and equitable to the whole population living in the Brazilian territory (Guerra, 2011).

In this context, municipal hospitals operated by public administration are a significant portion of healthcare providers (Botega et al., 2020). As regards management, due to the legal complexity involved, the organizational performance of public hospitals is usually shared between the various actors participating in them (Alchian & Demsetz, 1973; Jing et al., 2020).

One of the problems with SUS is the amounts paid to service providers, which often fail to cover the costs of healthcare procedures. In turn, this makes resources insufficient to the maintenance of hospital activities (Guerra, 2011). Thus, hospitals, whether public or private, face information asymmetry problems, with significant impacts on the services they provide, and therefore on their performance (Zogning, 2017).

Considering this scenario, this study adopts as its analytical-interpretive lens a strand of agency theory from the perspective of public policies. This strand holds that with regard to the 'principal and agent' relationship, the population can be understood as 'principal', and the public manager as its 'agent' (an accountability-based relationship); the government can be the 'principal', and private economic actors its 'agents' (regulation-based relationship); or government officials can be the 'principals,' while administrative units can be their 'agents' (supervision-based relationship) (Melo, 2015; Przeworski, 1996). Thus, the theoretical approach adopted here focuses on supervision and regulation relationships in which public resource providers (government) are understood as 'principals', whereas public, healthcare service executors, especially public and philanthropic hospitals funded by public resources, are the 'agents' (Li et al., 2022).

In the literature, studies on agency problems comprising hospitals in their scope are still scarce (Peltokorpi et al., 2020). However, research by Yan et al. (2010), Yan et al. (2014), and Lai and Tang (2018), which interpreted agency relationships in the Taiwanese context (one that bears similarities with Brazil in terms of healthcare distribution) stand out. Other studies dealing with agency problems indicate that organizations can develop financial, property, and behavioral controls to help with information management, thereby minimizing agency risks and problems (Afriyie et al., 2020). Thus, the study of management control mechanisms such as budgeting can lead to a broader understanding of agency problems, informing managers in their decision-making and in sharing information more effectively (Chapman & Kihn, 2009).

Considering the importance of budget in providing relevant information for performance evaluation and managerial decision-making (Mucci et al., 2016), and that budget management and cost control may affect resource use in hospital contexts (Homauni et al., 2023), this study analyzes the effects of information failures present in budgets on organizational performance measures. Thus, the concepts of Technical Efficiency and Quality in the provision of healthcare services were assumed as premises of organizational performance, both factors being related to resource use and non-financial performance.

Research on hospital efficiency shows that technical efficiency constitutes a measure of performance significantly related with public budget in healthcare systems (Pereira et al., 2021). Other studies recommend using the concept of quality along with that of technical efficiency to understand hospital performance more broadly, as service quality is among the main social dimensions of hospital care, representing the final product of healthcare provision (Ferreira et al., 2020).

Research addressing Technical Efficiency and Quality as performance measures and involving health organizations reveals that both have different assumptions, though equally relevant to organization performance (Ferreira et al., 2020; Lin et al., 2017; Yang & Zeng, 2014). Technical Efficiency is focused on maximizing the use of resources (Silva et al., 2017), while Quality is concerned with the effectiveness of services and the satisfaction of customers (Lin et al., 2017). Addressing these performance assumptions is justified by the fact that while efficiency and quality in healthcare services are dichotomous, both represent performance measures related with the organizational context and the information produced in it (Lin et al., 2017).

Considering that the problems posed by information asymmetries in management tools can be linked to organizational performance (Eisenhardt, 1985; Pereira et al., 2021), and in order to better understand the consequences of such information failures on the use of hospital resources, this study aims to analyze the effects that Information Asymmetry in the Budget Process exert on the Technical Efficiency and Quality of services provided in hospitals funded by public resources.

The study contributes to the exploration of agency theory in the field of Management Accounting (Mitnick, 2015; Mucci et al., 2016), as well as to deepening the discussion on the dichotomy between Technical

Efficiency and Quality through other theoretical concepts that can help explain this phenomenon (Afonso et al., 2023). The results are useful to assist hospital institutions funded by public resources in managing asymmetric information during the budget process, from the planning to the evaluation and control stages, enabling decision-making that can reduce the harmful effects and enhance the beneficial effects that agency relationship exerts on organizational performance.

2 THEORETICAL FRAMEWORK

2.1 Agency problems in the organizational context

A theoretical strand of the information economy that emerged to help understanding and mitigating problems related to information asymmetry is agency theory. It interprets the relationship between two actors, the principal and the agent, through the contractual communication between them (Eisenhardt, 1989; Fama, 1980; Jensen & Meckling, 1976).

Agency problems may occur before (ex ante) or after (ex post) contracts are established between principals and agents (Oliveira & Filho, 2017; Lambert, 2006; Maggetti & Papadopoulos, 2018). In addition, they can be classified into Adverse Selection or Moral Risk problems (Eisenhardt, 1989; Lambert, 2006; Mitnick, 2013). These problems arise from hidden information or actions between principals and agents, and may result in opportunistic behavior on their part (Eisenhardt, 1989; Lambert, 2006).

According to Mitnick (2015), agency problems can be employed in different scientific fields: sociological, institutional, and organizational. Studies by Przeworski (1996), Shapiro (2005), Ben-Ner and Ren (2015) and Martins et al. (2016) corroborate the use of agency theory in broader contexts, such as social and political ones. Specifically for the purposes of this study, the theory was employed in an organizational context, following the guidelines of Mitnick (2013, 2015), Eisenhardt (1989) and Boadway et al. (2004).

Studies in the organizational field show that corporations may use management tools in an effort to reduce agency problems, with such tools including budgeting (Lavarda & Almeida, 2013; Mucci et al., 2016) and managerial control systems (Chapman & Kihn, 2009; Kihn, 2011). Additionally, organizations can create active boards (Marques, 2007; Van der Stede, 2000) and establish solid contracts between the parties to a formal or informal negotiation (Williamson, 1998).

In the context of public organizations, agency theory assumes different configurations, aimed, for example, at regulation (public entities x private institutions), accountability (population x public entities), and supervision (public entities x bureaucrats) (Li et al., 2022; Melo, 2015; Przeworski, 1996).

The present study evaluated different stages of the budget process in publicly funded hospitals – from planning to control – to identify the presence of agency problems in the budget process. Thus, the approach focuses on supervision and regulation, in which the principal corresponds to public resource providers, and the agent, to public healthcare service executors.

2.2 Agency problems in the budget process

A budget is a tool for aligning organizational objectives and goals, operating with a preestablished expenditure limit that can vary according to its degree of flexibility (Lavarda & Almeida, 2013; Mucci et al., 2016). The budget can provide a basis for developing operational and strategic planning, in addition to influencing behaviors and improving processes (Hansen & Van der Stede, 2004; Mucci et al., 2016).

In the organizational environment, each participant has different interests, which can cause friction in relation to budget management. Budget information asymmetries, in this context, can lead to establishing goals that are unachievable, easily achievable, or not adjusted to the interests of those involved in the budget process (Lavarda & Almeida, 2013). Using a budget can help minimize information asymmetries, especially from a theoretical perspective that analyzes agency problems (Lopes & Martins, 2007). In addition, budgeting can be useful in formalizing information flow, sharing, use, and control across various areas and sectors of an organization (Chapman & Kihn, 2009) and in providing relevant information regarding organization performance assessment, either from a general perspective, or from the perspective of individual sectors or their managers (Mucci et al., 2016).

Thus, this study ascribes to budget the role of a contract, signed between the principal – public agencies that fund hospital activities – and the agent – hospitals that perform healthcare services. The study also considered the budget approval and sanction stages as the moment of contract establishment, in which both parties are aware of the agreed terms (Williamson, 1998), which correspond to the budgetary and financial targets established.

To meet these assumptions, budgeting was approached and analyzed in its temporal aspect, segregated in its planning (ex ante), execution, evaluation, and control (ex post) stages (Kihn, 2011). This temporal approach to budget also proved more appropriate for achieving the study goals, though there are other ways of classifying budget according to the goals of its efforts, usually affected by the complexity involved in each organization and how each of them interprets the artifact (Kihn, 2011).

2.3 Asymmetric hospital budget and its effects on hospital performance

In public organizations, while the heads of the executive branch are responsible for planning, approving, sanctioning, executing and controlling budgets, they are situated far from where public services are executed. This can generate opportunistic behavior on the part of agents, twisting the goals that were set in the budget by the principal (Lavarda & Almeida, 2013; Whaithaka et al., 2018). In hospitals funded by public resources, opportunistic behaviors may be even more pronounced, as the staff's credibility and reputation are routinely evaluated by patients, resulting in agency problems related to professional self-satisfaction (Li et al., 2022; Yan et al., 2010; Yan et al., 2014).

Research shows that noise in hospital budget management may stem from the fact that the principal has a cost-oriented behavior, concerned with the goals set in the public budget, savings in spending, and maximizing resources. Whereas the agent may, in turn, be motivated to meet patients' interests, providing quality service to them regardless of organizational objectives and limitations (Ferreira et al., 2020; Yan et al., 2014).

To minimize agency problems, hospitals can incorporate control mechanisms (Lavarda & Almeida, 2013; Yan et al., 2014) and establish financial and non-financial goal agreements between principals and agents (Faria et al., 2011). Studies indicate that the absence of controls on hospital resources or the presence of problems in their control mechanisms, such as the budget, can result in opportunistic attitudes. This leads healthcare service providers to do so in excess and unnecessarily, resulting in waste, misuse of resources, and decreased production in organizations (Lavarda & Almeida, 2013; Yan et al., 2010; Yan et al., 2014).

When it comes to control mechanisms, participatory budgeting can help reduce information asymmetries (Chow et al., 1988; Fisher et al., 2000). The involvement of diverse actors in the budget process can promote more assertive relationships between managers and subordinates, facilitate access to information otherwise restricted to subordinates, evaluate sectoral organizational performance, and convey a sense of justice and equity in employee evaluation and promotion (Kyj & Parker, 2008).

Participatory budgeting can arise as a defense mechanism in face of information asymmetry between principals and agents (Shields & Shields, 1998). In addition to its potential for combating information asymmetries, participatory budgeting can also reduce the harmful effects from the lack of budget planning. It can also contribute to a more efficient management, preventing waste and motivating employees to reduce costs and increase results (Brown et al., 2017; Fisher et al., 2002b; Karila et al., 2020).

Studies present budget as an important tool for evaluating and controlling organizational performance (Mucci et al., 2016). Specifically in the hospital context, research has shown that budget management and cost control can significantly affect resource utilization (Homauni et al., 2023). Also, technical efficiency has been shown to be a performance measure affected by public budgeting in healthcare systems (Pereira et al., 2021).

In this sense, it can be said that, at some point and somehow, the budget process affects the performance of hospital organizations, particularly their resource use and patient care (Homauni et al., 2023; Pereira et al., 2021). Theory leads to understanding that information asymmetries, when related to resource use and cost-effectiveness, can exert effects on Technical Efficiency, and when related to the effectiveness of patient care, can affect Service Quality (Ferreira et al., 2020; Lin et al., 2017).

The arguments above are based on the fact that both performance indicators have different assumptions. While Technical Efficiency seeks maximum resource utilization and process cost-effectiveness (Afonso et al., 2023), Quality is concerned with a hospital's ability to provide safe, adequate and timely care to patients (Ferreira et al., 2020).

Since quality is related with effectiveness, i.e., with the ultimate purpose of performance evaluation, maximizing quality and avoiding waste for greater sustainability is a complex task, one that should be desired, sought and, if possible, achieved by hospitals (Ferreira et al., 2020). In this context, hospital managers deal with constant dilemmas between controlling spending due to limited government resources and meeting the needs of patients without compromising quality (Homauni et al., 2023; Yan et al., 2014).

Based on what was presented throughout this theoretical framework, this study focused on two research propositions. The first considers that the information asymmetry between principal and agent, present in the

various stages of a hospital's budget process, from planning to evaluation and control, may be related with the misalignment of organizational goals, causing resource waste.

The second, in turn, assumes that higher hospital service quality can be influenced by the opportunistic behavior of hospital staff, oriented to meeting patients' demands, instead of a cost-oriented behavior, neglecting organizational guidelines and budget limitations. Thus, the two propositions were outlined as follows:

P_1: Information asymmetry in a hospital budget process, between principal and agent, has harmful effects on the hospital's Technical Efficiency.

P_2: Information asymmetry in a hospital budget process, between principal and agent, has beneficial effects on the hospital's Service Quality.

3 METHODOLOGY

3.1 Data collection and processing

This research was conducted using a multiple case study. This allows comparing the obtained data by similarities or differences (Stake, 2005; Yin, 2005). Despite not allowing result generalization, a multiple case study makes an in-depth, exhaustive analysis of the investigated phenomena and generates systematized situational knowledge that is useful for the investigated context (Gil, 2008; Stake, 2005). While results cannot be extrapolated, they are still useful in analyses and comparisons with similar organizational contexts.

To meet the investigation purposes, a set of methods was applied that allowed triangulating the information obtained, which includes information from documentary analysis, semi-structured interviews, and on-site observations (Marques et al., 2015). To operationalize the research, as recommended by Yin (2005), a protocol for the case study was set and followed, comprising goal, research question, propositions, units of analysis, field procedures, and other relevant information required. This procedure sought to minimize biases arising in the course of the study, especially regarding the researchers.

The studied field comprised two hospitals, both in the municipal sphere. The first is a philanthropic institution located in a hinterland part of the state of Parana. The second is public and located in the state of Santa Catarina. Both were selected because they receive most of their funding from SUS (a public source) and are large hospitals. About 200 hospitals with these characteristics were approached; however, due to the secrecy of the information focused on by the study, invitations to participate in the study were declined. Using the hospitals' names was not authorized. They were therefore identified throughout the study as Hospital of Case 1 (or Hosp. 1) and Hospital of Case 2 (or Hosp. 2), respectively.

There was a single criteria for selecting interviewees: being engaged in the hospital's management activities. A script was designed for the interviews and divided into six respondent profiles: Accounting and Controlling (Account./Control), dealing with budgetary and financial practices; Human Resources (HR. Dept.) and Technical Management (Technical. Manag.), dealing with Technical Efficiency and Quality of Services Provided; Quality (Quality. Dept.), dealing with quality as an organization; Administrative Management (Admin. Manag.), and Superintendence/Board (Super./Board), dealing with all subjects. Case 1 interviews were conducted on 05.24.2022, and those of Case 2, on 06.14 and 06.15.2022.

Table 1 describes the interviewees' profiles. Throughout the text, the interviewees were identified by codes assigned to each respondent, which also identified their work environment. For example: Resp. A (Hosp. 1); Resp. B (Hosp. 2).

Table 1.
List of respondents

Hosp.	Resp.	Role	Script used
1	A	HR Coord.	Dept. RH
1	B	Financial Consultant	Account./Control.
1	C	Accountant	Account./Control.
1	D	Superintendent	Super./Board
1	E	Care Manager	Technical. Manag.
1	F	Technical Director	Technical. Manag.

Table 1.
List of respondents

Hosp.	Resp.	Role	Script used
1	G	Cost Coord.	Admin. Manag.
2	A	Administrative Manager	Admin. Manag.
2	B	Managing Director	Super./Board
2	C	Budget Analyst	Account./Control.
2	D	Cost Analyst	Account./Control.
2	E	Financial Analyst	Account./Control.
2	F	Medical Accounts Coord.	Technical. Manag.
2	G	HR Head	HR Dept.
2	H	Quality Coord.	Quality. Dept.

The Hospital of Case 1, which is organized as a philanthropic institution, is not a direct member of the state's organizational structure; therefore, its agency relationship is concerned with regulation. In Case 2, the hospital is organized as public, directly linked to the organizational structure of the state's Direct Public Administration, and its agency relationship is concerned with supervision. Thus, the multiple case study provided a wealth of results and allowed analytical comparisons between both cases.

3.2 Analysis of data

Content analysis was used to analyze data, following the steps proposed by Bardin (1977). This involved the following: pre-analysis; exploration of material (or coding); treatment of results; and constructing inferences and interpretations about the analyzed data. The record units identified during the pre-analysis and material exploration steps were stratified by thematic topic (Oliveira, 2008). Thus, all text contents revolving around a central theme were aggregated and are treated in this study as constructs, as shown in Table 2.

The research focus on Technical Efficiency dealt with the cost-effectiveness of two specific types of resources, i.e., human and material (Ferreira et al., 2020). To determine what quality is with regard to medical care, a model widespread in the scientific context was used which considers the structure, processes and results (Donabedian, 2005). Information Asymmetry in the Budget Process is an innovative concept of this study. Table 2 shows the explored constructs.

Table 2.
Constructs

2nd order	1st order	Key themes of each category	Data collection	Basic studies
IABP	AS (Ex ante)	Different levels of information in the budget process; budget transfers inconsistent with hospital needs; communication failures in planning and budgeting.	Documentary research; interviews; direct observation.	(Almeida & Costa, 2018; Brown et al., 2009; Fisher et al., 2002a; Lavarda & Almeida, 2013; Yan et al., 2010, 2014)
	MR (Ex post)	Hidden action in budget execution; intentional misuse of resources.		
Efficiency	Technique	Adequate, waste-free use of human and capital resources.	Documentary research; interviews; direct observation.	(Souza et al., 2016; Silva et al., 2016; Souza et al., 2017)
Quality	Structure	Adequate facilities, equipment and organizational structure.	Documentary research; interviews; direct observation.	(Donabedian, 2005; Ferreira & Marques, 2019; Ferreira et al., 2020; Peters et al., 2008)
	Process	Adequate care and professional skills.		
	Outcome	Patient satisfaction; adequate diagnostics; low mortality.		
	Access	Adequate conditions of access to healthcare services.		

Abbreviations: IABP: Information Asymmetry in the Budget Process; AS: Adverse Selection; MR: Moral Risk; TE: Technical Efficiency; QL: Quality; ST: Structure; PR: Process; OUT: Outcome; AC: Access.

The study was submitted to the Permanent Committee on Ethics in Research with Human Beings, via Plataforma Brasil (PB), and was approved as per the Certificate of Ethics Presentation (CAAE) number 45012621.0.0000.0104. Prior to approval on PB, requests for data collection by e-mail were sent to the hospitals' ethics committees and were approved. Before the interviews began, each respondent was given a copy of the Informed Consent Form (TCLE), and their signatures were collected.

4 PRESENTATION AND DISCUSSION OF RESULTS

4.1 Presentation of cases

For the analyses, the Principal-Agent information flow was mapped in the organizational context of the studied hospitals. The contact between Principal and Agent was segregated in an information flow, so as to deal with the state's participation in hospital budget processes, and in a flow of financial transfers, so as to deal with the financial needs and limitations of both Principal and Agent. This is compatible with the arguments presented by Faria et al. (2011) that agency problems in an organization may be reduced by financial and non-financial agreements.

As shown in Figure 1, the information flow is represented by green arrows and may occur through verbal and written communication, based on regulations, official announcements, opinions, meetings, among other means of communication. While this research looks at a broad context regarding the study of information asymmetries, it respects the strongest premises of agency theory disseminated by Jensen and Meckling (1976) and Fama (1980), assuming the agency relationship to exist mainly through the fact that the principal funds the agent's activities by transferring financial resources to it, whereas the agent performs activities of interest to the principal.

Thus, the flow of financial transfers was represented by yellow arrows. In this agency relationship, hospitals report to the government's Direct Administration the amounts and details of services provided to SUS patients, a measure widely known as hospital production, which results in financial reimbursements from SUS to the hospital.

Finally, Figure 1 presents the possibilities that information asymmetry occurs in the communication process for all organizational levels (red arrows). During the study, failures in the communication process, from the information origin to its destination, were found to occur: at the external levels, between principal and agent; at the intraorganizational levels of the agent; before (ex ante) the contract has been established; and after (ex post) the contract has been established. In this study, the contract corresponds to the organizational budget, based on the premises established in the sanction of the budget bill.

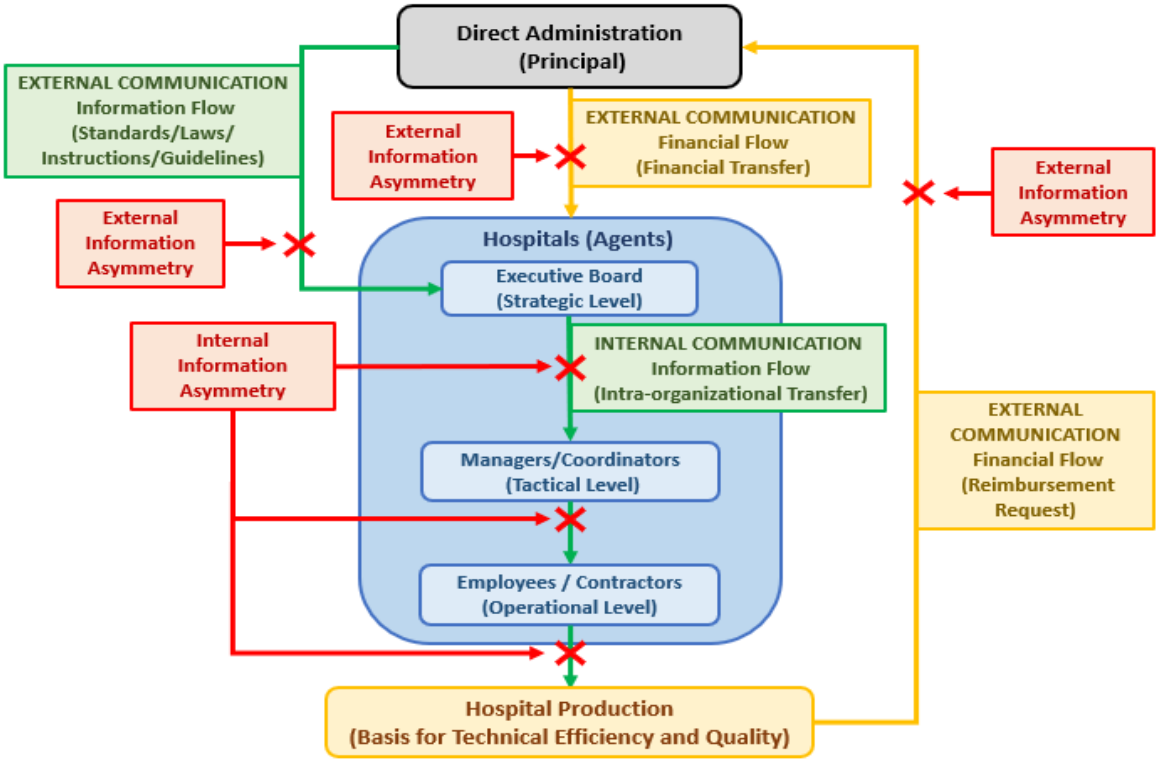

Figure 1. Agency relationship model in the hospital context

The hierarchical structure of Hospital 1 consists of General Assembly, Board of Officers, Chief Executive Officer, Chief Clinical Officer, and Chief Technical Officer, as well as the Administrative, Tax and Community Boards. Below these are the Superintendence and the Management. Currently the hospital offers medical services in various specialties, from basic care to intensive care units.

Hospital 1 operates surgical inpatient care, clinics, lab tests, as well as support imaging and an internal pharmacy. The organization is considered large, and its care capacity is over 150 beds. It is funded by mixed resources, 90% of which come from SUS transfers, and the remaining 10% from transfers under agreements with private healthcare plans. Figure 2 shows the flow of financial transfers to Hospital 1.

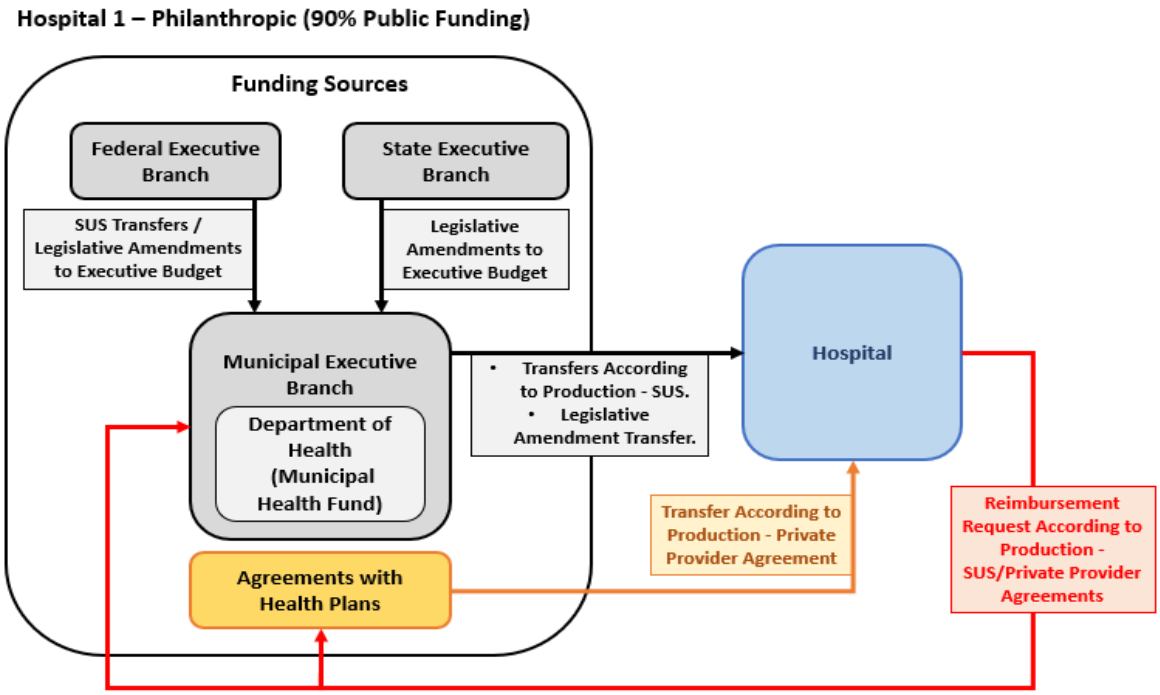

Figure 2. Philanthropic hospital funding flow (Case 1)

Unlike Case 1, Hospital 2 is part of the structure of the state's Direct Administration. Its hierarchy has a CEO, two Boards of Officers, Financial Management, Administrative Management, 13 Coordinators and eight Supervisor offices. This hospital also offers medical services in various specialties, such as pediatrics, orthopedics, and adult and pediatric ICU. The organization is considered to be large, with a capacity of over 150 beds, and it operates surgical inpatient care, clinics, lab tests, as well as support imaging and an internal pharmacy. Its president also holds the position of municipal health secretary; the hospital's administrative director holds the position of financial coordinator for the Municipal Health Department.

In Case 2, transfers from SUS are complemented by resources from 15% of municipal tax revenues, the minimum allocation mandated for the municipality. Figure 3 shows the information flow in Case 2.

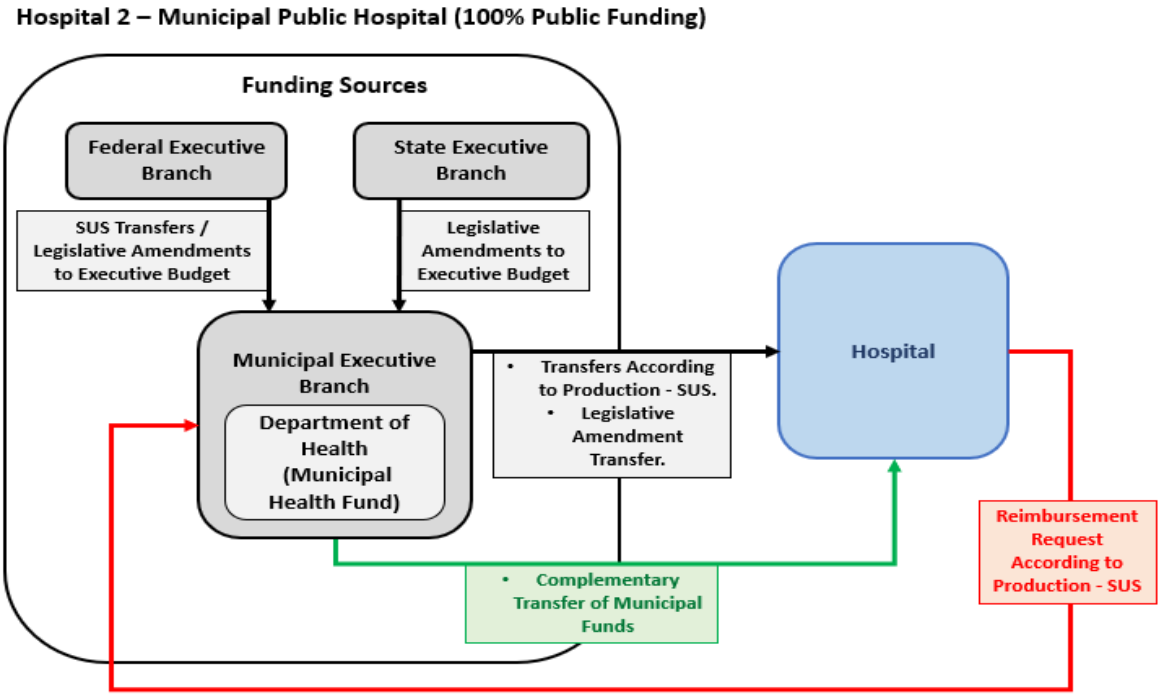

Figure 3. Public hospital funding flow (Case 2)

Table 3 shows the frequency of record units related to Information Asymmetries in the Budget Process (IABP). The units were separated into positive, indicating the presence of agency problems, or negative, denoting their absence. To inform such data, Table 4 presents the composition of asymmetries in the budget process regarding its environment and time of occurrence.

Content analysis resulted in a positive balance of 88 record units indicating the presence of Information Asymmetry in the Budget Process. The affirmative responses about the presence of external asymmetries ex ante the establishment of contracts in Case 1 indicate mainly the lack of monitoring by public agencies in the hospital's budget creation and planning processes. This lack of close tracking showed that public agencies' budgetary documents have little relation with the budget developed in the philanthropic hospital organization.

While regulations have been issued by agencies of the national financial and budgetary systems to inform budget planning, it was found that specific municipal rules and instructions addressing the reality of philanthropic hospitals are insufficient. As explained by Williamsom (1998), regulations are important in supporting the reduction of information asymmetries. If such regulations are not put into practice, or in the absence of control mechanisms attesting the proper use of standards, then these have failed to produce significant effects (Chapman & Kihn, 2009; Kihn, 2011).

In contrast, agent efforts to establish a more effective communication with the principal were identified; however, such efforts have focused only on the transfer of funds, and not on planning their application. This study does not intend to infer that the responsibility for preparing hospital budgets should fall on state entities; however, results indicate that a greater participation of public agencies in the planning process could be less harmful to hospital budget execution.

Table 3.
Frequency of record units for Case 1

Case 1: Philanthropic hospital				
Content analysis coding type: thematic topics/central themes				
Total record units for the central theme (IABP): 150				
Record units that indicated the existence of IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
IABP	119	Adverse selection	96	80.7%
		Moral risk	23	19.3%

Table 3.
Frequency of record units for Case 1

Record units that denied the existence of IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
IABP	31	Adverse selection	8	25.8%
		Moral risk	23	74.2%
Balance of record units dealing with IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
AIPO	88	Adverse selection	88	100.0%
		Moral risk	0	0.0%

Abbreviation: IABP: Information Asymmetry in the Budget Process; RF: Relative Frequency; Qty: Quantity.

The results pointed out by Hansen and Van der Stede (2004) and Shastri and Stout (2008) agree with such inferences, since they identified that agency problems have detrimental effects on the budget planning and control functions related to resource allocation, resulting in waste and budgetary slack.

External, ex post asymmetry was observed to a greater extent, mainly due to the outdated values in the SUS table, which reveals the incompatibility in public agencies' resource transfers in relation to hospital procedure costs. Ninety percent of Hosp. 1 resources come from SUS, and at the time of this study the hospital had a financial deficit of approximately 30 million. This situation indicates a misalignment between the hospital's budgetary and financial needs and public organizations' financial and budgetary planning.

When asked about the government-hospital communication in preparing the budget, Resp. A (Hosp. 1) said:

> *No participation! In fact, recently, and because of the hospital's situation, of the risk of closure of some wards [...] A conversation began with the state [...] It's well-known that transfer amounts are not enough to cover the services to be performed (Resp. A, Hosp. 1).*

Also, Resp. F (Hosp. 1) reported that:

> *The SUS table is a chronic problem [...] It hasn't been readjusted for more than 20 years, and now we're feeling the heat, especially in this post-pandemic period, the rises in medications, inputs, materials, and medicines in general for hospitals have a higher cost, and they have no readjustment (Resp. F, Hosp. 1).*

The evidence indicates that while the principal is limited to simply transferring funds through a table of reimbursements for medical procedures that is long outdated, the agent develops its budget with severe failures in expense planning, resulting in a constant need for budget reallocations.

Table 4.
Asymmetry occurrence time and environment

Case 1: Philanthropic hospital							
Record unit		Time	Quantity	RF %	Environment	Quantity	RF %
IABP	Yes	Ex ante	81	68.1%	External	58	48.7%
					Internal	23	19.3%
	119	Ex poste	38	31.9%	External	7	5.9%
					Internal	31	26.1%
	No	Ex ante	6	19.4%	External	1	3.2%
					Internal	5	16.1%
	31	Ex poste	25	80.6%	External	12	38.7%
					Internal	13	41.9%
	Balance	Ex ante	75	85.2%	External	57	64.8%
					Internal	18	20.5%
	88	Ex poste	13	14.8%	External	-5	-5.7%
					Internal	18	20.5%

Abbreviations: IABP: Information Asymmetry in the Budget Process; RF: Relative Frequency.

There is also a lack of monitoring by public entities in the budget execution process, compromising the effectiveness of the hospital's actions in financial and budgetary terms. The collected data shows that staff believe that the institution is neglected by public agencies, as there is an excessive delay in the transfer of SUS funds by the municipality. The analysis of the institution's financial reports showed that the transfer process delay is currently around 3 to 5 months.

In addition, it was mentioned in the interviews that public agencies are not seen as responsible for the hospital's possible poor results in performing its functions, since philanthropic organizations are segregated from the administrative structure directly linked to the state. This view results in a moral problem that distorts the principal's own interest, a fact contrasting with the classical literature of agency which relates agency problems solely motivated by the agent's actions.

In Case 1, the RUs that deny external ex post information asymmetry outnumber the records indicating their existence. This is due to the fact that public bodies demonstrate to be very competent in applying corrective and regulatory measures on hospital actions. However, such control practices were evidenced as insufficient, since they correspond to correction measures taken after mistakes were made, and were limited to financial penalties, as in the case of reimbursement disallowances due to hospital procedures deemed incorrect by SUS auditors.

When asked about the control exercised by the government regarding the hospital's budget execution, Resp. D (Hosp. 1) reported that:

> *We have to account for it, so the municipality is concerned, you know, but monitoring is done according to legal provisions. As for a more proactive participation within the process itself, there is none (Resp. D, Hosp. 1).*

The results indicate the need for greater involvement of the state in the hospital's budget planning actions and decisions. The fact that the state has to disallow many healthcare services or issue adverse opinions on many statements can be an indication of its own absence from the hospital's management decisions. Table 4 makes this absence evident in the frequency with which external ex ante asymmetry was affirmed, as it was denied only once.

In Case 1, internal ex ante asymmetry was mostly attributed to the lack of adequate budget planning by the hospital. A worrying fact, as effective communication with the principal is relatively difficult when the hospital itself lacks clarity about its own spending. In the first case, a fairly assertive budget forecast for revenues was found; however, it is inadequate for public expenses. Thus, excessive reallocations are carried out between hospital expenses during the financial year.

The following accounts shows the lack of budget planning on the part of the hospital:

> *We don't have an annual budget projection, what we set at the end of each month is an expectation for inflows with outflows and a comparison to see how payments will behave (Resp. B, Hosp. 1).*

> *In fact, we don't have a well-defined budget (Resp. C, Hosp. 1).*

Linked to the relative absence of budget planning in Case 1, there is also a lack of intraorganizational communication between the hospital's strategic and tactical levels and operational levels, another internal ex ante problem that indicates the lack of a participatory budget. The information shared between principal and agent about revenue forecasts and expenditure limitations occurs only at the strategic level, with the Superintendence and the Controllership.

When asked whether hospital staff are well-informed about the hospital's budgetary issues, Resp. A (Hosp. 1) reported:

> *Many have been working here for many years, but they don't know where funds come from, they don't know what the funds are for, they don't know the amount of the debt we have, they don't know how it works internally [...] in my view, all these also cause other issues we struggle with at the institution. So I think a meeting should be held monthly, [...] An exposition of what we had to spend, what we had as benefits, the resources we had (Resp. A, Hosp.1).*

Also, Resp. F (Hosp. 1) added that:

> *The level of knowledge, both in the medical class and the nursing class, about what is transferred on for a given procedure, the amount received for performing that procedure, the cost that it generates for the hospital, I can tell you that maybe not even five percent are aware of it (Resp. F, Hosp. 1).*

This factor is relatively serious for hospital care outcomes, more specifically for technical efficiency, since it is the operational-level staff who have direct contact with patients and ultimately use the public funds. These arguments corroborate the findings of Chow et al. (1988), Fisher et al. (2000), and Lavarda and Almeida (2013), who explained that the absence of a participatory budgeting technique intensifies information asymmetry and results in harmful effects for budget planning.

As regards internal ex post problems, provider-induced demand was identified, mainly due to the way financial reimbursements for hospital production are made. In Case 1, it was reported that the hospital may sometimes increase the volume of healthcare services performed so it can receive greater reimbursements. This practice is consistent with the arguments of Fisher et al. (2002a), which report that organizations can create additional obligations to secure greater budget (and thus financial) limits.

In Case 1, it was found that not all ex ante problems arise from Adverse Selection, and that Moral Risk problems occur not only ex post the establishment of contracts, and therefore this non-equivalence counters most of the literature of agency theory. During data collection, opportunistic actions were found to occur as early as in the hospital budget planning and creation stages, even before it took effect; problems were also found after budget execution began, arising from a lack of information, and not necessarily from opportunistic actions.

Regarding the Technical Efficiency construct, poor use of resources was found to occur in Case 1, mainly with respect to material and human resources. This was found to be mainly due to inadequate use of clinical resources, not always treated economically, and due to some degree of staff idleness. Based on the triangulation of data and with the help of spreadsheets for better interpretation of the content analysis, it was concluded that technical efficiency is more absent than quality-related measures.

Regarding Quality, no problems were identified in Case 1 concerning service accessibility. In terms of Quality results, some room for improvement was found, the absence of which is shown by the content analysis. The quality of structure and processes were the most critical factors. The evidence denying the presence of structural quality is linked to the hospital's limitation in not meeting its healthcare service demand, in addition to an insufficient amount of equipment and beds. Regarding the quality of processes, the study points out that sectoral procedures are not always clear, and that there is human failure in their execution.

It can be inferred that more hospital efforts are required to avoid waste than to improve the quality of services provided. A pro-organization behavior by the staff was more prominent in the philanthropy than in the public sector, motivated by the institution's social and non-profit goals.

In contrast to Case 1, in Case 2 an excessive concern of the municipal entity with hospital actions was found, mainly because the society's view on the municipal government's healthcare performance is directly linked to the hospital's performance, as it belongs to the same public organizational structure.

A greater duality was found between Adverse Selection and Moral Risk in the public hospital (Table 5). Proportionally, there is a higher Information Asymmetry balance in Case 2 related with behavioral problems. In Case 2, a greater lack of concern with public assets was reported and perceived.

Table 5.
Frequency of record units

Case 2: Public hospital				
Content analysis coding type: thematic topics/central themes				
Total record units for the central theme (IABP): 127				
Record units that indicated the existence of IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
IABP	70	Adverse selection	41	58.6%
		Moral risk	29	41.4%
Record units that denied the existence of IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
IABP	57	Adverse selection	35	61.4%
		Moral risk	22	38.6%
Balance of record units dealing with IABP				
2nd order construct	Qty	1st order construct	Qty	RF %
IABP	13	Adverse selection	6	46.2%
		Moral risk	7	53.8%

Abbreviation: IABP: Information Asymmetry in the Budget Process; RF: Relative Frequency; Qty: Quantity.

Table 6 shows the composition of Information Asymmetry in the Budget Process regarding its environment and time of occurrence for Case 2. Although the municipal public entity and Case 2 hospital are more closely linked, the answers indicating external ex ante asymmetries deal mainly with a lack of interaction by governmental entities at the federal and state levels in the budget creation and planning stages, limited to fund transfers.

The account of Resp. A (Hosp. 2) shows the limitation on fund transfers:

> *From the federal government, all we have is the agreed ordinances on medium and high complexity resources. With the state, I'll tell you that, today, the main deficiency in financial contribution is state resources, so given a situation like this, the state is in a deficit in financial transfers, so we have a greater guarantee of receipt from the federal government than from the state government (Resp. A, Hosp. 2).*

In contrast, the record units denying the presence of external ex ante asymmetries reported that the agent has a good relationship with the municipal government, allowing a more effective allocation of budget resources. The account of Resp. A (Hosp. 2) indicates that:

> *It's really a full interaction. Although there's this specificity on the hospital's side, which is a very typical scenario. The municipality is really focused on the basic healthcare part, but it's indeed a partnership of the municipality here. I'll tell you it's a very present situation (Resp. A, Hosp. 2).*

Resp. B (Hosp. 2) stresses the closeness between principal and agent by saying that:

> *The same team that makes the healthcare budget is the team that makes the hospital budget. It's easy to make the budget. Both the Annual Budget Law and the Budget Guidelines Law can be easily made by the hospital budget team here, the main problem lies in the execution, really (Resp. B, Hosp. 2).*

Table 6.
Asymmetry occurrence time and environment

Case: Hospital 2							
Record Unit		Time	Quantity	RF %	Environment	Quantity	RF %
IABP	Yes	Ex ante	40	57.1%	External	30	42.9%
					Internal	10	14.3%
	70	Ex poste	30	42.9%	External	2	2.9%
					Internal	28	40.0%
	No	Ex ante	34	59.6%	External	32	56.1%
					Internal	2	3.5%
	57	Ex poste	23	40.4%	External	18	31.6%
					Internal	5	8.8%
	Balance	Ex ante	6	46.2%	External	-2	-15.4%
					Internal	8	61.5%
	13	Ex poste	7	53.8%	External	-16	-123.1%
					Internal	23	176.9%

Abbreviations: IABP: Information Asymmetry in the Budget Process; RF: Relative Frequency.

The results above corroborate the findings of Chow et al. (1988) and Fisher et al. (2000), which identified an increase in harmful effects from information asymmetry due to a lack of more participatory budget planning. They also coincide with the results of Hansen and Van der Stede (2004) and Shastri and Stout (2008), which highlighted negative impacts on resource allocation in scenarios with the presence of agency problems.

External ex post asymmetries were mainly related to the impacts caused by SUS table's outdated amounts. In this regard, the negative record units corroborated the control power exerted by the state, as they were above the affirmative record units. In addition, the absence of monitoring by municipal public entities over the budget execution process was not reported in Case 2.

The evidence showed that the municipal public entity assists the hospital during the budget execution process periodically, according to the account of Resp. B (Hosp. 2):

> *Transfers really fall short of what incoming funds should be, and the municipality already passes a lot of its own resources to fund this hospital, so the whole difference not covered by SUS, the municipality has to cover it (Resp. B, Hosp. 2).*

Unlike Case 1, the internal ex ante asymmetries in Case 2 pointed to more adequate budget planning for the public hospital, for both revenue collection and expense allocation, due to the principal's participation. However, even with more effective communication, the financial incompatibility persists, since the reimbursement scheme for services performed by SUS in Case 2 is the same as in Case 1, considered outdated and insufficient to meet hospital demands.

In Case 2, internal asymmetries ex post budget execution were also found, such as: (i) budget increase through new agreements; (ii) expense reallocations; and (iii) provider-induced demand, pushing services for greater transfers. Although such practices indicate a lack of planning, they were reported as necessary by the hospitals' management for re-planning and readjusting the budget and financial flows.

Additionally, in Case 2 it was found that budget information at the intraorganizational level was not treated as carefully as it was in Case 1, with harmful effects for technical efficiency in Case 2. Table 6 shows that the most problematic environment in Case 2 is the intraorganizational environment, whether ex ante or ex post to establishing the budget. Thus, the information shared between Principal and Agent is less effective, as it is limited to the most strategic organization levels, revealing a budget that is not participatory.

When asked about the budget communication process, Resp A (Hosp. 2) and Resp. D (Hosp. 2) revealed that:

> *It could be better worked on, so much so that one of our goals [...] is to create a more aligned and continuous information base, at the level of the distribution of financial results information to the rest of the hospital (Resp. A, Hosp. 2).*

> *For the general public, it's not clear, I think even though the information is available out there, sometimes it's not very palatable to the end user. Internally, I don't see public servants very interested in it (Resp. D, Hosp. 2).*

Regarding the Technical Efficiency, resource waste and misuse was also found to occur in Case 2. In large part, these inferences were reported as a consequence of intentional actions of staff with tenured positions in the hospital. The accounts indicate that they do are not cautious in handling resources.

Firstly, this is attributed to the fact that resources are not associated with a specific individual, but rather with society in general. Second, because some professionals take advantage of the benefits of tenured employment. Additionally, the organizational structure of Case 2 provides a greater volume of financial transfers from the municipal government entity, a condition conducive to wastefulness, due to a feeling that there is greater financial slack in the organization, and therefore greater availability of resources.

The Quality associated with healthcare service accessibility was present in Case 2. No problems were reported regarding the hospital's location or long waiting lines. In addition, the hospital provides care in various medical specialties, expanding its healthcare scope. While result-oriented quality was affected by the mortality rate, that rate was reported to be acceptable under the hospital's conditions. Regarding patient satisfaction, the hospital was reported to be well-rated by society in general, and patients sometimes make SUS-related complaints.

Structurewise, the hospital was recently renovated, and its facilities are fit for healthcare provision. Some staff members expressed reservations, saying that the hospital's facilities are not irregular, but could be improved. Some hospital blocks were found to be in better conditions than others. Though only two pieces of equipment available at the hospital were in repair, equipment damage was cited as regular, mainly due to misuse by staff. In any case, equipment readjustment was said to be made in a timely manner.

Similarly to the first case, the quality of processes was considered to be the most critical factor. While accounts indicate that standard operating procedures are reviewed monthly, some work processes were found to be confusing for employees, or were sometimes unavailable. Both for the first and the second cases, the most often reported process flaws involve the organization's human resources. Thus, the findings revealed a greater presence of problems related to Adverse Selection in Case 1 and to Moral Risk in Case 2.

Figure 4 shows in parallel the asymmetries of hospitals 1 and 2 to better elucidate the data in Tables 4 and 6.

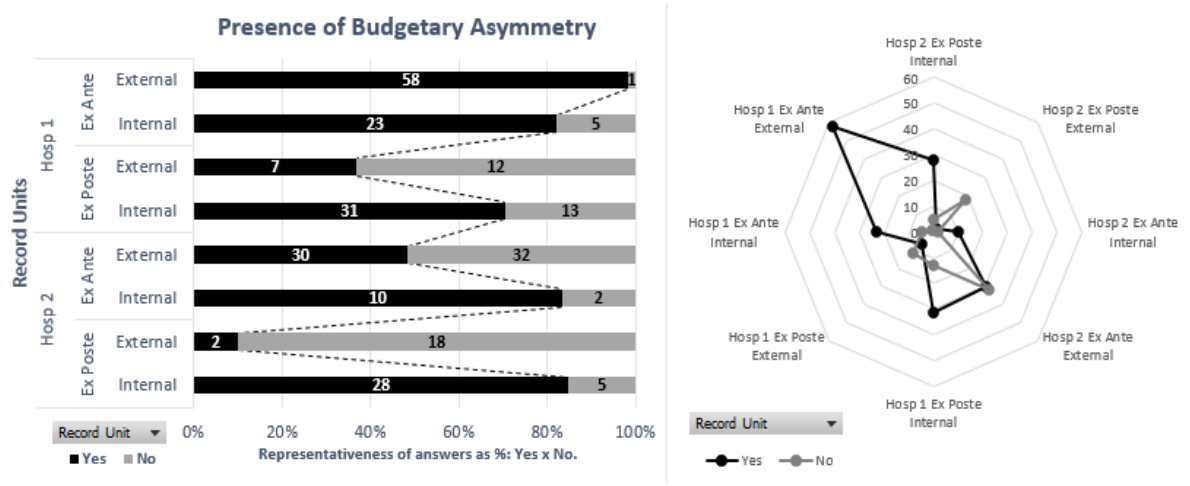

Figure 4. Comparison of information asymmetries between Cases 1 and 2

Figure 5 shows the relationship between the theoretical categories discussed in the study, according to the frequency of record units for Cases 1, 2, and mixed (or multiple).

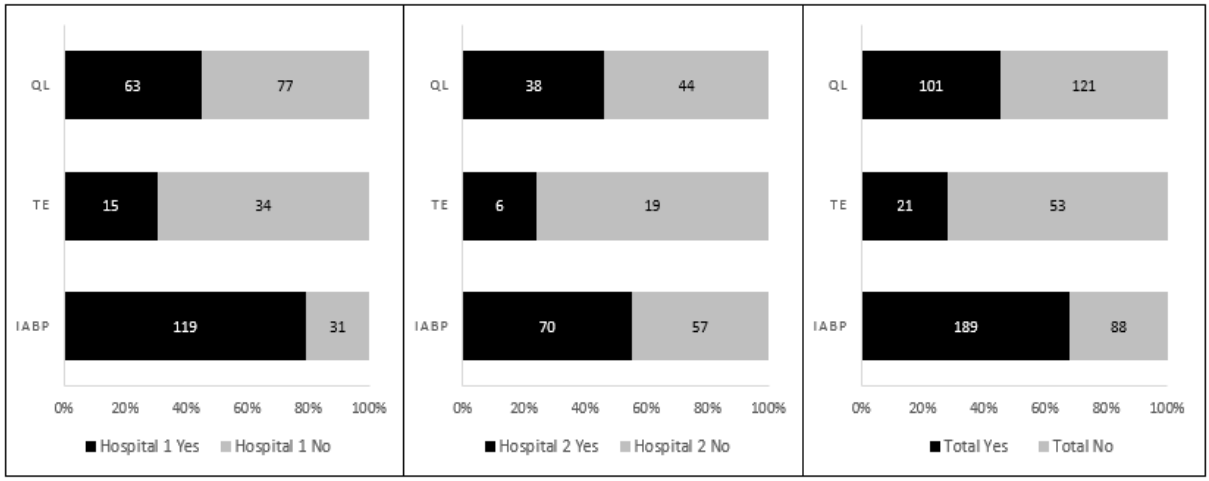

Figure 5. Comparison of record units between Cases 1 and 2

A considerably greater presence of asymmetry was found in Hosp. 1 compared to Hosp. 2. This is mainly due to the fact that the former does not belong to the same state administrative structure, while the latter is directly linked with the Health Department.

4.1 Inferences about the study's propositions

Proposition 1 posited that Information Asymmetry in the hospital Budget Process, between principal and agent has detrimental effects for hospital Technical Efficiency. It was thus shown that the distance between public entities and hospitals in the planning and creation stages of the hospital budget document harms Technical Efficiency, contributing to a budget being approved that is inconsistent with the hospital's real needs, mainly because the state is the main responsible for funding these institutions.

These results are consistent with the findings of research that has pointed out the benefits of a more participatory budget in addressing environmental and task development uncertainties and reducing information asymmetry between the hierarchical levels of an organization, reinforcing the interdependence of organizational sectors (Karila et al., 2020; Kyj & Parker, 2008; Shields & Shields, 1998). Additionally, Kamau et al. (2017) found that a greater participation of diverse actors involved in the budget process can increase the commitment of the parties involved in budget execution.

Such distance unfolds into problems related with the misuse of public resources and with disengaged behaviors by hospital staff towards budgetary assumptions. If budget planning is not clear for all levels of the organization, inefficiency situations increase in the execution stage of public services. These results corroborate the findings of Brown et al. (2017), Fisher et al. (2002a), and Karila et al. (2020), which showed that a budget prepared in a more participatory manner results in more efficient management and in orientation to reducing costs and increasing results. In addition, it also agrees with the findings of Ancarani et al. (2009), which explained that information asymmetries contribute to increased costs and reduced efficiency.

Thus, the relationship between public entities and hospitals regarding the control of budget execution proved to be very proactive and efficient, yet insufficient to deal with problems related with Technical Efficiency. Therefore, it was reported that such controls contribute little as an educational measure, while standing out in terms of punishment. In addition to the distance between principal and agent, the lack of internal communication between strategic, tactical and operational sectors, regarding budgetary information, was also associated in the research as a harmful factor for resource cost-effectiveness.

The account of Resp. C (Hosp.1) is in line with the above inferences:

> *Information on public resources that come to the hospital stays mostly in the administrative area. [...] we must show the situation to all employees, because if someone sees something dropped on the floor and won't pick it up, or someone is wasting something, that's also because they don't know the situation. [...] overall, people have no clue [...] (Resp. C, Hosp. 1).*

When agency problems were related to increased resource scarcity, such as the outdated amounts in the SUS table, they had an opposite effect on Technical Efficiency, indicating that financial outdatedness in the relationship between hospital production and reimbursement causes the budget to be more restrictively allocated, which can mitigate the harmful effects of asymmetry on performance. Such inferences corroborate the findings of Fisher et al. (2002a) which attested the contribution of a restricted budget to reducing budgetary slack, decreasing asymmetries, and increasing subordinates' efforts to perform tasks.

The second research proposition was that Information Asymmetry in the hospital Budget Process has beneficial effects on Quality. Just like the first proposition, the second was also supported in the course of the study, though with reservations. With regard to service provision, the clinical staff are oriented to meeting patients' needs, rather than acting according to budgetary premises or in line with financial resource limitations. This scenario drives gains in quality, specifically quality oriented to the outcome aspect, since patients feel more satisfied when their requests are met. The account of Resp. H (Hosp. 2) when asked about the clinical body's position in delivering healthcare service explains this view:

> *[...] It's more focused on the patient, [...] this amount issue has no bearing in care delivery [...]* (*Resp. H, Hosp. 2).*

These results are consistent with the findings of Yan et al. (2019) which showed a negative view by physicians at 110 Chinese hospitals operating under a global budget, regarding restrictions imposed by budgetary controls to limit the costs of medical services and regarding the clinical body's perception of decreased care quality by way of low patient satisfaction.

The reservations mentioned in proposition 2 are linked to the allocation of scarce resources and the staff's latitude of action. While the hospital does all it can so that healthcare quality is maximized, SUS table's outdatedness, which contributes to cost-effectiveness, forces hospitals to operate with scant resources, harming quality due to the lack of necessary structural investments. The study of Li et al. (2022) showed that public hospitals whose government fund transfers were more consistent with their realities performed better in providing quality healthcare services compared to private hospitals, as they had more resources and better equipment.

In the study field, agency problems linked to the distance between Principal and Agent, when related to incongruence in fund transfers, were found to result in lower quality, as hospitals in this scenario are less able to purchase equipment, make structural reforms, perform maintenance, among other investments considered necessary, causing hospitals to suffer losses in their structural quality, processes, and therefore outcomes.

In this context, Resp. B (Hosp. 2) reported that:

> *I'm in favor of disseminating information, because I think collaborative governance gives people some notion of the costs of their industry, of what they were doing, of a zeal they didn't have with materials, the equipment. It's interesting to learn how much*

> *the industry is throwing resources away. Sometimes, without those resources, we can't afford some equipment or material that would make our day-to-day, our service easier* (*Resp. B, Hosp. 2).*

Also, Resp. B (Hosp. 1) said that:

> *[...] if we had more attention from the public area, it would be much better. But, like, to catch their attention, you need to poke them [...] That's an important step so that in the future they'll participate more and understand and contribute so the hospital can meet its purpose, which is to embrace people in need of healthcare* (*Resp. B, Hosp. 1)*.

According to the findings of Li et al. (2022), other evidence in the study indicated that loosening the budgetary and financial ties that guide and limit budget execution can encourage opportunistic behaviors, generating greater freedom of action and the pursuit of satisfaction by the staff.

The results also show that the effects of this professional freedom were reported now as beneficial to quality, as they can enhance staff creativity and motivation, now as harmful, as they can result in wastefulness, neglect, induced demand, and other opportunistic behaviors related to moral risk.

Thus, Information Asymmetry in the Budget Process resulted in dichotomous effects for Technical Efficiency and Quality, harmful to the former and beneficial to the latter. This dichotomous position is in line with other scientific findings, such as the studies of Arthur (2016), Dismuke and Sena (2001), Singaroyan et al. (2006), and Valdmanis et al. (2008). At the very least, the findings of propositions 1 and 2 may indicate that there is an independence effect between Technical Efficiency and the Quality of services, as in the findings of Chang et al. (2011) and Navarro-Espigares and Torres (2011).

5 FINAL CONSIDERATIONS

The study analyzed the effects that Information Asymmetries in the Budget Process exert on Technical Efficiency and Quality. Therefore, the research proposed that agency problems would have detrimental effects on Technical Efficiency (Proposition 1) and beneficial effects on Quality (Proposition 2) in the service provision.

The results obtained allowed to infer that Information Asymmetry in the Budget Process, when related to a lack of planning and shared budget information, has harmful effects on Technical Efficiency and beneficial effects on Quality. However, when asymmetry is related to a financial misalignment that causes Resource Scarcity, it has an opposite effect on both performance measures.

Thus, the study showed that public entities should demonstrate a greater concern with hospitals, even if these are not directly linked to the administrative structure of the state, actively participating in the processes involving the planning of public spending.

This study contributes significantly to the understanding of information asymmetry in budget processes, especially those pertaining to healthcare in the public and nonprofit private sectors. It was also significant for agency theory, showing that agency problems may be caused not only by agents, but also by the principal, and that Adverse Selection and Moral Risk problems, respectively, do not occur only ex ante and ex post the establishment of contracts.

The discussions and findings about the dichotomy between Technical Efficiency and Quality showed that scientific research needs to advance to a more micro level of this relationship, that both measures have different premises which behave differently. Understanding other constructs and variables related with Technical Efficiency and Quality constitutes a fertile scientific ground and may guide future research.

Future research may also deepen the study of Information Asymmetry in the Budget Process in other organizational contexts that explore different economic contexts. The literature highlights that agency problems are particular to each organizational scenario.

This study's main limitations refer to the presence of different biases on the part of either the respondents or the researchers. Although the case study protocol was strictly followed, the "researcher" factor is very strong in qualitative research. Another limitation refers to the fields of study comprised in the research. Despite exploring the perception of a hospital employee who holds the position of finance secretary, the studied phenomenon presents only the perception of hospitals and not that of public entities as an organization. In addition, using agency

theory to approach organizational problems was a complicating factor for data collection in the field work, as it added to a more limited access to hospital information.

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APPENDIX

Interview script

INITIAL INFORMATION

Hospital: _____

Property type: _____

Interviewee (name): _____

Sector / Department: _____

Position / Occupation: _____

Contact email address: _____

Contact phone: _____

Coding (defined by the researcher): _____

SECTION 1

This section aims to capture your perception of different information levels that may exist between the direct administration bodies that fund the hospital's activities and the (public / nonprofit private) hospital, as well as the hospital's technical efficiency.

Below are some notes about terms used in this section:

> Direct Administration Bodies: Bodies pertaining to the federal, state, and municipal power. This type of public management includes the presidency of the republic, the federal government's ministries, and state and municipal departments.
> Hospital Management: Consider the hospital superintendent, clinical and administrative managers, heads of departments, and other employees with management positions.
> Hospital Employees/Staff Members: If no direct mention is made to a specific position (doctor, nurse, others), then consider both clinical and administrative bodies, be they tenured public servants, staff hired via a public bidding process, or through normal recruiting.
> Budget Allocation: This refers to the budgetary credit amount/limit available for executing hospital expenses.

Id. Question	Questions	Super. / Board	Manag. / Admin.	Manag. / Technical	Account. / Control.	HR Dept.	Quality Dept.
Section 1 - Block 1 - General questions about the budget process							
1	In general, how does the hospital budget preparation process occur?	X	X	X	X	X	X
2	What role do you play in the hospital budget preparation process?	X	X	X	X	X	X
Subtotal - Section 1 / Total - Block 1		2	2	2	2	2	2

Id. Question	Questions	Super. / Board	Manag. / Admin.	Manag. / Technical	Account. / Control.	HR Dept.	Quality Dept.
Section 1 – Block 2 – Adverse selection in the budget process							
3	How do the public bodies that fund the hospital's activities participate in the hospital budget preparation process?	X	X		X	X	
4	Regarding the sources of budgetary resources transferred to the hospital by public bodies (bound and/or free), as well as their purposes: do they meet the hospital's real needs? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur?	X	X		X		
5	Throughout the year, do the public bodies that fund the hospital's activities analyze/check/monitor the hospital spending based on the transferred amounts? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur?	X	X		X		
6	In general, are hospital staff members well-informed about (or do they know) the public resources that are transferred to the hospital? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur?	X	X	X	X	X	X
7	Are hospital staff members well-informed about (or do they know) the hospital's budget amounts and limits? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur?	X	X	X	X	X	X
8	Are the budgetary resources transferred to the hospital by public bodies sufficient to meet the hospital's needs? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X	X		
9	During the year, is it necessary to rearrange budget allocations in the hospital budget (redirecting the spending planned in the initial budget)? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X		X		
Subtotal - Section 1 / Total - Block 2		7	7	3	7	3	2
Section 1 – Block 3 – Moral risk in the budget process / technical efficiency							
10	Do hospital staff make good use of public resources, avoiding wastefulness? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur? * Additional subject, if not argued: Inefficiency or moral risk?	X		X			X
11	Do hospital staff reuse available resources (among those with permitted reuse)? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur? *Additional subject, if not argued: Inefficiency or moral risk?	X		X			X
12	Are there cases of incorrect medication distribution and incorrect service provision to patients? *If so, and not argued: How does that occur? *If not, and not argued: Why does that occur? *Additional subject, if not argued: Inefficiency or moral risk?	X	X	X		X	X

Id. Question	Questions	Super. / Board	Manag. / Admin.	Manag. / Technical	Account. / Control.	HR Dept.	Quality Dept.
13	Do hospital staff prioritize patient needs over financial and budgetary planning (guidelines and limitations)? *If so, and not argued: Why does that occur? *Additional subject, if not argued: Inefficiency or moral risk?	X	X	X	X		X
14	Does a higher volume of hospital spending during the year lead to increases in budget resource transfers from public bodies to the hospital the following year? *If so, and not argued: Why does that occur? * If not, additional subject: Is there such a possibility?	X	X		X		
Subtotal - Section 1 / Total - Block 3		5	3	4	2	1	4

SECTION 2

This section aims to capture your perception of some aspects related to the quality of services provided by the hospital.

Id. Question	Questions	Super. / Board	Manag. / Admin.	Manag. / Technical	Account. / Control.	HR Dept.	Quality Dept.
Section 2 – Block 1 – Structure quality							
15	Does the hospital have sufficient equipment to meet patient demands (stretchers, machines and equipment, etc.)? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
16	Is the hospital well-maintained and in good use condition? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
17	Is the hospital administrative structure well-organized? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X	X	X	
18	Are there cases of full capacity/overcrowding of beds available for hospital care? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
Subtotal - Section 2 / Total - Block 1		4	4	4	1	1	3
Section 2 – Block 2 – Process quality							
19	Are healthcare staff properly qualified (in terms of academic training)? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X		X	X
20	Do healthcare staff receive technical (or other) training? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X		X	X

Id. Question	Questions	Super. / Board	Manag. / Admin.	Manag. / Technical	Account. / Control.	HR Dept.	Quality Dept.
21	Are the hospital processes and procedures well-organized and understandable for the hospital staff? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X		X	X
22	Is there excessive bureaucracy in the hospital care processes (from beginning patient care to their exit/discharge)? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X			X
Subtotal - Section 2 / Total - Block 2		4	1	4	0	3	4
Section 2 – Block 3 – Outcome quality							
23	Does the hospital meet the needs of patients? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X			X
24	Are there cases of patient complaints about the hospital care? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X		X	X
25	Does the hospital face judicial proceedings filed by patients? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X	X	X	X
26	Are there cases of return appointment / rehospitalization due to inadequate hospital procedures? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X			X
27	Are there hospital death cases in this healthcare unit? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X		X	X
Subtotal - Section 2 / Total - Block 3		5	3	5	1	3	5
Section 2 – Block 4 – Access quality							
28	Does the hospital provide care in various specialties, being able to meet the various cases/needs of patients? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X		X			X
29	Do patients face long queues or long waiting time to receive care? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
30	Do patients have easy access to the distribution of medications? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
31	Does the population have easy access to the area where the hospital is located? *If so or not, and not argued: Why does that occur (or why it doesn't)?	X	X	X			X
Subtotal - Section 2 / Total - Block 4		4	3	4	0	0	4
Total questions		31	23	26	13	13	24

SECTION 3

This section aims to capture some characteristics of the hospital. We emphasize that no data which allows identifying the hospital or the respondent will be disclosed.

32. Which of these categories does the hospital fall into?

- ☐ General hospital: Intended for providing healthcare in basic specialties, by specialists, and/or other medical specialties;
- ☐ Specialized hospital: Intended for providing healthcare in a single specialty/area;
- ☐ Day/Isolation hospital. Units specializing in short-term healthcare, in between outpatient care and hospitalization;
- ☐ Others (specify): _____

33. Regarding establishment size and the number of beds available, the hospital is:

- ☐ Small-sized: It has a normal or operating capacity of up to 50 beds;
- ☐ Medium-sized: With a normal or operating capacity of 51 to 150 beds;
- ☐ Large-sized: It has a normal or operating capacity of 151 to 500 beds;
- ☐ Extra capacity: It has an extra capacity, above 500 beds.

34. Do you consider that the political relationship (good or bad) between the direct administration public bodies that fund the hospital's activities and the hospital management can influence the transfer of funds to and the establishment of new agreements (or lack thereof) with the hospital? *If so or not, and not argued: Why does that occur (or why it doesn't)?

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