

The influence of public sector audit digitalisation on local government budget planning: evidence from Brazil

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Abstract

Purpose – This article analysed how data collection systems (DCS) developed by governmental audit organizations (Court of Accounts) affect budgetary planning within local governments.

Methodology – Eighteen semi-structured interviews complemented by six time-lagged interviews via Whatsapp were carried out with the actors involved in the preparation and auditing of the Medium-Term Expenditure Framework in Brazilian local governments. Documents such as the structured layouts of Courts' DCS and the publicised Medium-Term Expenditure Framework (MTEF) prepared by local governments were also analysed.

Findings - Our findings indicate that Courts' DCS structured layouts reduce local governments' budgetary planning autonomy in elaborating their MTEF. It happens as the Courts' main driver is to make MTEF information auditable and not to improve the usefulness of information by governments. As a result, the planning choices of the local governments end up limited, not by the general legislation but by the rules established by the computerized systems of the Courts.

Originality – Our paper's originality relies on demonstrating that the digitalisation of audit processes ultimately affects local governments' practices through structured layouts for the data collection on MTEF information - that impose rigidity on the budget planning process of local governments. We highlight the role of public sector auditing organisations as potential catalysts of reforms; however, this should be considered cautiously since the drivers and motivations of the organisation that sponsors public financial management reforms matter for overall reform effectiveness.

Keywords - Courts of Audit, *multi-year plan*, audit society, organizational change, public financial management reforms, digital infrastructure.

Paper type - Research paper

1. Introduction

Audit practices are a "vehicle for change" in audited organisations (Power, 1999, p. 91). By "making things auditable", audit organisations have the potential to constitute the environment in which audit practices are applied – i.e., changing processes and routines at the audited organisation (Power, 1996). While such potential may lead to side effects that undermine audited organisations performance (Power, 1999), it may also create awareness and traction towards auditees' practices that are desirable (Power, 2021). External auditors, thus, may play an important role in the implementation of reforms in public financial management systems (Gourfinkel, 2022; World Bank, 2013). For instance, external audits may indicate the need for reforms (Brusca *et al.*, 2016), legitimise the practices that are necessary for the

implementation of reforms (Lino *et al.*, 2019), and close regulatory gaps through its audit reports whenever interpretive flexibility is in place (Aquino *et al.*, 2020).

In recent years audit has become digital (Power, 2022), and public audit is expected to incorporate computer-assisted audit tools into their practice (INTOSAI, 2000). For instance, to collect and analyse vast volumes of data, public sector auditing organisations have been developing data collection systems (DCS), which are digital applications that require local governments (auditees) to compulsorily upload data from their financial management information systems to be audited (van Zyl *et al.*, 2009; Aquino *et al.*, 2022b). Aquino *et al.*, (2022a) bring evidence that Brazilian Courts of Accounts' DCS are expanding auditing beyond fiscal-budgetary data – allowing them to oversee public tenders, procurement, payroll, and public works – among others. In effect, the digitalisation of audit is increasing the scope of things that can be made auditable (see Power, 2022).

One way in which audit organisations might impact audited organisations' practices is through the development of a digital infrastructure around their DCS. A digital infrastructure is defined as a collection of distinct but connected digital tools or computational systems that coevolve (Fürstenau *et al.*, 2019, Aquino *et al.*, 2022a). For instance, while Courts of Accounts develop and upgrade their DCS, local governments' financial management information systems need to be updated to meet DCS data upload requirements (Aquino *et al.*, 2022a). Thus, the public audit digital infrastructure emerges as audited organisations' financial management information systems evolve based on the requirements of DCS structured layouts and data architecture (Aquino *et al.*, 2022a).

Extant literature remains silent about the consequences of governmental audit organisations' digitalisation on the implementation of public financial management reforms. As seen, the emergent public audit digital infrastructure might shape the way information is being registered and reported by audited organisations. Indeed, one concern arising from the widespread usage of DCSs is that local governments may lose autonomy due to the standards and norms enforced by the emerging digital infrastructure (Aquino *et al.*, 2022b). When local governments perceive a loss of autonomy, they may resort to decoupling the activities related to the audit process from the core organisational processes in place – affecting their performance (Oliver, 1991; Power, 1999) and overall effectiveness of public financial management reforms. Thus, the effects of audit digitalisation on public financial management reforms should not be ignored.

One prominent public financial reform that has been advocated by donors as a best practice (and aid condition) for developing countries to strengthen their public financial management systems over the past few decades is the implementation of medium-term expenditure frameworks (MTEF) (Boex *et al.*, 2000; Filc and Scartascini, 2010; World-Bank, 2012; Sherwood, 2015; Hopper *et al.*, 2017; Schiavo-Campo, 2009; Raudla *et al.*, 2022; Mkasiwa, 2022). MTEF outline government spending over a period of three to five years (Pearson, 2002), and its main goals are to increase the fiscal policymaking horizon of governments, ceiling annual budgets, reducing the emphasis on short-term objectives, and promoting efficient resource allocation over time (Raudla *et al.*, 2022; Fakharzadeh, 2016; Schick, 2009).

Extant literature highlights some critical factors towards MTEF's effectiveness. First, reform proponents in each country should establish a comprehensive regulatory framework to support MTEF implementation (i.e., central coordination), such as rules for the creation of government programs and their goals (Filc and Scartacini, 2010; Blazey, 2018; Harun *et al.*, 2020). Second, basic financial compliance must be established, including a reliable accounting system and effective external financial audits (World Bank, 2013; Schick, 1998). Finally, MTEF implementation depends on the material and human resources that must be (re)organised at local governments, including putting in place appropriate financial management information

systems (World Bank, 2013; Orelli *et al.*, 2016; Lino *et al.*, 2022) and maintaining local government's autonomy towards budgetary planning. MTEF reforms are usually concurrent to financial management information systems reforms (Hopper *et al.*, 2017), pointing out to the importance of analysing emergent public audit infrastructures that affect the development of local governments information systems.

Relying on Power's (1999) argument that audit practices may lead to side effects that undermine the performance of audited organisations and considering the potential effects of the emergent digital infrastructure on audited organisations' practices, we analyse how data collection systems developed by governmental audit organizations affect budgetary planning within local governments. Document analysis and semi-structured interviews (complemented by time-lagged interviews) were carried out with the actors involved in elaborating and auditing the MTEF in Brazilian local governments.

Brazil is a sound case to be analysed since Brazilian Courts of Accounts (governmental audit organisations) have developed their data collection systems over the last three decades (Aquino *et al.*, 2022a). Courts of Accounts in Brazil are also constantly closing regulatory gaps through interpretations of available regulations while defying standard setters and public financial management reform proponents (Aquino *et al.*, 2020). In the case of MTEF, Brazilian local governments have autonomy for the elaboration and execution of their budget planning instruments, and there is little direct coordination on the production of their MTEF information (World Bank, 2012). Despite a constitutional requirement for local governments to develop their MTEF, there is no clear regulatory framework detailing how MTEF should be implemented – leading to interpretive flexibility – and creating space for Courts of Accounts to close this regulatory gap.

Our findings point out that, due to the lack of a regulatory framework, some Courts of Accounts assume the central coordination of the reform aiming to make the MTEF information auditable (see Power, 1999) – and not aiming to increase information usefulness for local governments. These Courts require the upload of MTEF information via DCS, demanding a structure and a model for budget planning which goes far beyond general and undetailed guidelines present on legislation, resulting in reduced autonomy for local governments to develop their MTEF. On the other hand, local governments appear to have greater autonomy to select the MTEF model that best suits their informational demands when the Court of Accounts does not use DCS in auditing such type of information. In summary, the layouts and data structure imposed by DCS can make the planning model rigid, affecting the adoption of alternative MTEF models by local governments, thus generating a standardization effect through the emerging public auditing digital infrastructure.

Our findings bring a threefold contribution to the literature. First, we demonstrate that local governments' practices are impacted (even negatively) by emerging digital infrastructures on public auditing. Second, we highlight governmental auditing organisations' role as potential catalysts of reforms when “interpretive flexibility” is in place. Third, the catalyst role of audit organisations in public financial management reforms should be considered cautiously, as the drivers and motivations from the sponsor of such reforms matter for their effectiveness.

2. The context of the medium-term expenditure framework in Brazil

Medium-term expenditure frameworks (MTEF) – sometimes referred to as a multi-year budgetary plans, medium-term planning, or medium-term expenditure ceilings (Raudla *et al.*, 2022; Schiavo-Campo, 2009; Filc and Scartascini, 2010; World Bank, 2013) – are mainly characterized by the allocation of baseline expenditure over a period of three to five years and the subsequent use of such allocation on the budget preparation process and execution of fiscal policy (Raudla *et al.*, 2022; Fakharzadeh, 2016; Shick, 2009).

To promote institutional reforms in the budgetary process, several countries – regardless of their administrative traditions – have adopted MTEF, both for central and local governments (World Bank, 2012; Sherwood, 2015; Robinson, 2016; Raudla *et al.*, 2022). For instance, in the early 2010s, in only five European countries (out of twenty-three), the MTEF does not cover local governments (Filc and Scartacini, 2010). Despite the diffusion of the model, MTEF varies widely concerning its structure and form of organisation (Filc and Scartacini, 2010; Sherwood, 2015).

Following this trend, Brazil started taking initial steps toward its approach to MTEF in the 2000s as part of the so-called “managerial budget reform” (Barcelos and Calmon, 2014). This reform required governments to develop a performance-based budgeting model, together with fiscal projections, for a period of four years. Although some studies argue that Brazil lacks a formal MTEF (World Bank, 2012; Tollini, 2021), we agree with Filc and Scartacini (2010, p. 16) in that the current approach to a multi-year budgetary plan in Brazil can be traced back to an MTEF; for instance, by focusing on the creation of government programs, composed of both financial (allocation) and non-financial (outputs/outcomes) projections. The four-year multi-year budgetary plan (MTEF) is complemented by two other instruments called ‘budgetary guideline law’ and the ‘annual budgetary law’ (Tollini, 2021). The budgetary guideline law is considered a medium-term *fiscal* framework instrument (World Bank, 2012), in which governments carry out three-year fiscal planning, such as indebtedness and primary result targets. The annual budgetary law is the traditional annual public budget (Tollini, 2009). This context creates a complex and rigid budgetary planning model based on three integrated planning instruments which apply to all governmental layers, i.e., including local governments (Spilimbergo and Srinivasan, 2019).

Although MTEF has increasingly become a part of global changes in public financial management, its implementation is far from simple. Indeed, extant literature notes that MTEF implementation is a difficult process that demands time and public resources; in addition, many nations only employ the MTEF as a formal and ceremonial exercise (Filc and Scartacini, 2010), such as by creating an unrealistic budget (Schiavo-Campo, 2009). In the case of Brazil, the literature has pointed out that local governments still have low levels of adequacy in the adoption of budget reforms and often present ceremonial adoption of budgetary practices (Azevedo and Aquino, 2016, 2022; Azevedo *et al.*, 2019) and low quality of performance indicators (World Bank, 2012). Zuccolotto *et al.*, (2022) argue that this current scenario stems from reforms on external control mechanisms carried out in recent decades and favoured short-term fiscal control – mitigating incentives to develop medium-term thinking.

There are 29 Courts of Accounts (Brazilian governmental audit organisations) responsible for the external control of budgetary and fiscal data in the local governments’ MTEF. The Courts’ independence in designing their inspection model has led to divergences among them on interpreting fiscal regulations (Nunes *et al.*, 2019). Courts utilise a remote audit model, carried out electronically (Aquino *et al.*, 2022a). In this model, local governments record and monitor tax, accounting, and fiscal transactions using financial management information systems, typically outsourced from software firms (Azevedo *et al.*, 2020b); meanwhile, this data is uploaded to the Courts of Accounts via data collection systems (DCS) (Aquino *et al.*, 2022a). Despite having a broad audit scope, the Courts continue to uphold the main focus on budgetary and fiscal information (Azevedo and Lino, 2018), including monitoring MTEF information.

As a result of the wide acceptance of DCS usage, the Courts have increasingly amplified the scope of information required and have used their autonomy to define the level of information detail (Aquino *et al.*, 2022a). The layout of the information required by the Courts may affect how the information is organized by the audited local governments (Aquino *et al.*, 2022a). This may generate effects on local governments, which end up having their autonomy

in the organization of information affected due to the standards and norms imposed by the Courts' information systems.

However, the Brazilian Constitution guarantees that local governments should have broad autonomy in elaborating and planning MTEF instruments. Moreover, there is little direct coordination from Central to subnational governments (World Bank, 2012), which is seen as an important mechanism in a country with a high degree of decentralization (Spilimbergo and Srinivasan, 2019).

Despite being a constitutional rule, there is no detailed supportive legislation for the MTEF. The 2000's managerial budget reform, coordinated by the central government, adopted 'soft' methods such as education and persuasion (Di Francesco and Alford, 2017; Barcelos and Calmon, 2014), and the existence of a formal law standardizing the content of the MTEF was not a priority. In turn, a comprehensive regulatory framework to support MTEF implementation is lacking, with no clear rules guiding the creation of government programs and their goals – something considered essential for the effective implementation of this instrument (Filc and Scartacini, 2010; Blazey, 2018; Harun *et al.*, 2020).

As no legislation regulates the content of the MTEF, multiple interpretations and practices related to its implementation have emerged (Amorim *et al.*, 2020). In effect, the MTEF content was initially organized through models in manuals. Two of them were the most prominent: first, the one produced by the Central Government (MOG, 1999), which brings conceptual foundations around the MTEF developments; the second manual was developed in 2005 by the São Paulo state Court of Accounts, linked to the layouts for data collection via DCSs (Azevedo and Aquino, 2016). Despite the manuals, the absence of a regulatory law leaves some gaps in Brazil, with doubts as to whether the MTEF should comprise all expenditures or just a medium-term investment program, an important issue pointed out by Schiavo-Campo (2009).

Following the initial manuals, the MTEF model was organized in central and local governments using programs-based budgeting, linked to budgetary actions, detailed in 4 years, with indicators associated with results, in a performance-based budgeting model (named the '*traditional model*'). However, its scope has changed over the last two decades. The central government – followed by some local governments - began to change the traditional model towards the '*contemporary model*'. In the contemporary model, the budgetary actions were excluded from the MTEF, and the programs were no longer detailed in four years, moving this decision to a later step of prioritization through the budgetary guideline law. Therefore, both models (traditional or contemporary, Table 1) could be adopted according to the decisions of each government. However, suppose a particular Court of Accounts requires, via their DCS layouts, that the government program must be detailed in each financial year. In that case, the audited government ends up receiving pressure for adequacy. Thus, the external audit may be affecting and, in effect, reducing the autonomy of local governments in deciding their MTEF model (see Power, 1999).

Table 1. Traditional and Contemporary MTEF model

Traditional MTEF model – four years			
Y 2022	Y 2023	Y 2024	Y 2025
Program 001	Program 001	Program 001	Program 001
Budgetary activity 001	Budgetary activity 001	Budgetary activity 001	Budgetary activity 001
Budgetary activity 002	Budgetary activity 002	Budgetary activity 002	Budgetary activity 002
Program 002	Program 002	Program 002	Program 002
Budgetary activity 003	Budgetary activity 003	Budgetary activity 003	Budgetary activity 003
Budgetary activity 004	Budgetary activity 004	Budgetary activity 004	Budgetary activity 004
Etc.	Etc.	Etc.	Etc.
Contemporary MTEF model – four years			

Y 2022	Y 2023	Y 2024	Y 2025
Program 001	-----	Program 001	-----
Program 002		Program 002	
Etc.		Program 003	
		Etc.	

Note. All budgetary programs and activities must have both financial and non-financial targets

3. Effects of emergent audit digital infrastructures in local government practices

Proponents of public financial management reforms, such as the implementation of MTEF, usually mandate change towards local governments in a top-down manner (Vakulenko, 2021; Jayasinghe *et al.*, 2020; Adhikari *et al.*, 2013, Liguori and Steccolini, 2012). Public sector audit organisations play an active role in enforcing such top-down requirements and constructing legitimacy to current reforms, demonstrating a tremendous potential to act as a catalyst for public financial management reforms (Shand, 2013; Aquino *et al.*, 2020). Moreover, whenever there are regulatory gaps or "interpretive flexibility" around accepted practices, audit may play a role in negotiating how those practices should be implemented (Power, 1996).

More generally, Power (1999) points out to the role of auditing organisations in shaping auditees' organisational practices. In one extreme, the audited organisation may become colonized by the audit process. By making things auditable (Power, 1996), audit becomes the reference point to (almost) all organisational activity within the audited organisation that pursues compliance to auditable measures of performance and established systems of control. This leads to non-reflexive compliance to the audit process, undermining audited organisations' autonomy – since "compliance is a loss of discretion, a constraint, and an admission of limited autonomy." (Pfeffer and Salancik, 1978, p. 94). On the other extreme, audited organisations decouple from the audit process, meaning that core routines and practices do not change; but compartmentalized and formal processes are instituted to comply with audit demands. Power (1999) argues that both extremes (colonisation and decoupling) may undermine the performance of audited organizations. Recently, Power (2022) acknowledged that decoupling and colonisation are a simplification of concrete and complex organisational responses from auditees to audit processes – especially due to the digitization of audit that, in short, is increasing the scope of 'things that can be made auditable'.

Digitalization increases auditing organisations' capacity to create environments in which they operate. For instance, Power (1996, p. 295) discusses whether "controls, measurement systems and their associated forms of documentation pre-exist the audit process or have been created with a view to making the organization auditable". In the context of digitally-led public financial management reforms, local governments must develop or contract off-the-shelf financial management information systems to cope with auditing digital demands (Lino *et al.*, 2022). In effect, new organisational control practices and information systems are put in place within local governments to respond to the audit processes. The co-evolution of individual but interconnected digital artifacts, such as auditors' DCS and local governments' financial management information systems, are known as digital infrastructures (Fürstenau *et al.*, 2019).

Digital infrastructures are often built up around information systems that far exceed their intended life span, i.e., legacy systems (Fürstenau *et al.*, 2019). Furneaux and Wade (2017) indicate that whenever such systems remain functional to the organisation, they are not replaced due to previous investments and overall system complexity. Indeed, legacy systems replacement brings enormous economic and operational risks to organisations (Rinta-Kahila, 2018). To increase the usability of legacy systems, new information systems are connected to them, i.e., digital infrastructure is built. Following a path dependence approach, in the presence

of contingency and self-reinforcement patterns leading to the lock-in effect (Vergne and Duran, 2010), the legacy systems are ultimately maintained due to the increasing returns of usage linked to the investment in supplementary systems that form the digital infrastructure. In the case under analysis, the core scripts of Courts of Accounts' DCS were written up in the late '90s and early 2000s (Aquino *et al.*, 2022a), and new auditing modules have been connected to the legacy systems aiming to increase its usability (Aquino *et al.*, 2022b). Thus, Courts of Accounts' DCSs are complex systems built up upon costly investments over time, and their development follows a path-dependent trajectory (Aquino *et al.*, 2022a). If the DCS remains functional, the Courts may have little or no incentive to change them.

The emerging digital infrastructures connecting audit organisations and auditees end up creating a compulsory digital transformation in local governments, i.e., when despite their willingness, resources, or skills, local governments are forced to adopt a digital innovation to comply with requirements from top-down public financial management reforms that are enforced by audit organisations (Lino *et al.*, 2022). As noted, this is the case of DCS developed by audit organisations that end up affecting the practices of audited local governments (Aquino *et al.*, 2022a). As audit automation increases the degree of legal coercion, vigilance, and enforcement of reforms, local governments may have no other option but to comply with mandated changes expressed in regulations in this highly regulated and coercive environment (Oliver, 1991). However, whenever local governments perceive a loss of autonomy due to external auditing requirements, Oliver (1991) argues that it should be expected that they will conform ceremonially to the reform's endeavours (i.e., decouple).

In sum, due to the lack of regulatory clarity regarding the MTEF development and implementation in Brazil, the Courts of Accounts closed regulatory gaps by implementing structured data collection layouts on MTEF information. The digitalization of audit may end up affecting practices at the organisations being audited – due to the need to comply with audit requirements. On the other hand, even if the data collection layouts are obtrusive to local governments' operations, Courts of Accounts have no incentive to change it due to path dependency. In effect, local governments may decouple to respond to auditing requirements. This matter will be explored in the remaining of the article.

4. Methodology

This paper relies upon a two-staged qualitative approach based on documentary analysis and interviews to analyse how data collection systems developed by governmental audit organizations affect budgetary planning within local governments. Following, we describe each of the stages.

First stage - documentary analysis. We run this stage following two steps. First, in January 2021, we collected information on the data collection of local governments' MTEF information (e.g., DCSs data collection structured layout) – available on most of the websites of all 29 Courts of Accounts in Brazil responsible for auditing local governments. When this information was not publicly available, we requested it via e-mails or formal demands through the Brazilian Freedom of Information Act. We identified 15 Courts of Accounts that developed information systems that gather structured data related to MTEF (i.e., develop a layout to collect this data in an automated way). The 14 remaining Courts of Accounts gather information related to MTEF via PDFs, paper documents, or have direct access to documents for carrying out the MTEF audit. For instance, direct access to documents occurs when Courts audit a single local government (cases of São Paulo and Rio de Janeiro cities). After collecting the data for each of the 19 Courts identified which develop information systems, we organized them into spreadsheets establishing the model of MTEF (traditional or contemporary, see Table 1) required by their data collection systems' structured layout. The predominant criteria used to

categorize the MTEF model is their temporal presentation. On the one hand, in the MTEF “contemporary model”, targets, indicators, and values are allocated as a single piece – a “block” detailing separately only the first year of validity of the MTEF, while the remaining three years are merged. Under the MTEF “traditional model”, on the other hand, each year is detailed separately.

Second, we collected publicly available documents related to the local governments' MTEF. Those are the budgetary documents related to medium-term planning that should be available on the websites of each local government. To do so, we accessed transparency websites of local governments that are the state capitals and the following five largest local governments in the same state - this is due to each Brazilian state having one specific Court of Accounts responsible for overseeing the local government's compliance to the law in that geographical region. Rio de Janeiro and São Paulo cities are the state capitals of their respective states, and a specific municipal-level Court of Accounts audits both. In these cases, the state-level Court of Accounts oversees all local governments from that state, except for the state capital. Thus, in these specific cases, we analysed the five largest local governments audited by the state-level Court of Accounts in each state, plus the capitals audited by the municipal-level Court of Accounts. Local governments' MTEF models were verified to determine whether they present: (i) government activities; (ii) product of the action; (iii) government program; (iv) non-financial targets, and (v) temporal presentation following the traditional or contemporary MTEF model.

In sum, we collected documents related to how MTEF information is collected (electronically or analogically) by all Brazilian Courts of Accounts responsible for auditing local governments. Moreover, we collected information on the actual MTEF in place in the five largest municipalities and the state capital under the jurisdiction of each Court (except for São Paulo and Rio de Janeiro, as explained above).

Second stage – semi-structured interviews. From February 2021 to February 2022, we conducted semi-structured interviews with people in charge of developing the MTEF in local governments. We focused our interviews on local governments that followed a MTEF 'traditional model', as required by the Courts data collection systems' structured layout, since these cases may indicate that the local governments do not have the autonomy to change the MTEF model in place. In the cases in which the selected interviewee from the largest municipality in the state did not consent to participate in the study, we randomly interviewed another municipality with the same characteristics located in the same state. The first contact with potential interviewees was carried out through an e-mail available on the local government's website and sent directly to the respondent. Following a snowballing approach, the people in charge of developing MTEF in local governments suggested that 'financial consultants' should be interviewed to illustrate a broader perspective on the matter. We followed up on interviews with financial consultants. Indeed, consultants were relevant for the analysis because they observed all the stages of preparation, registration, and uploading the budgetary information related to MTEF to the Courts of Accounts. In addition, financial consultants are professionals in contact with several local governments, presenting extensive experience and knowledge. In Brazil, most municipal governments outsource their accounting software and, in some cases, the entire accounting function to a private consultancy (Azevedo *et al.*, 2020a; 2020b). Usually, financial consultants indicate the accounting procedures to be adopted by the local governments (Aquino and Neves, 2019). In this way, consultants act as certifiers and evaluators of the idea (Christensen and Skærbæk, 2010). Around 82.9% of the local governments had financial consultants in 2015 (IBGE, 2015).

We conducted 19 interviews with 18 interviewees (an average of 47 minutes each), totalling 14 hours of audio recording. The characteristics of the interviewees are detailed in Table 2. Respondents were invited to share their thoughts via open-ended questions, making

them more active in providing information (Lively *et al.*, 2019). The interview protocol followed three steps. First, questions were posed to introduce the interviewee to the subject, knowing their trajectory and knowledge. Second, the following set of questions aimed to determine how budget planning and data upload to the Courts of Accounts occurs. Finally, the last set of questions aimed to undercover how the DCS interfere with the local government's autonomy to prepare its planning, making the interviewee reflect if s/he perceives any influence of the Court's DCS in the budget planning, making it not feasible for them to choose their MTEF model.

Interviews were fully transcribed, and coding was developed to group the information systematically to assist in the data analysis (Gioia *et al.*, 2012). Our initial coding was inductive – i.e., the categories emerge from the interviews. The data was grouped into themes according to their familiarity to identify patterns in the coding, organize them and describe the data in detail (Braun and Clarke, 2006). A total of 107 sentences were grouped into six categories: (1) effect of the municipality's lack of structure on planning; (2) the DCS of the Courts of Accounts made the structure of municipal planning objective and rigid; (3) local governments have autonomy in internal processes; (4) changes in systems and rules during accountability; (5) rework to upload information to DCS; (6) impediment of uploading data. Trustworthiness was achieved since the three authors validated all categories, and disagreements on codes were resolved through ongoing negotiations.

Table 2. Characteristics of the interviewees

Interview	Occupation	Source	Number of Interviews	Duration (min)
1	Accountant	Association of Local governments	1	40
2	Systems Analyst	Software supplier firm	1	48
3	Accountant	Local government MTEF preparer	1	32
4	Consultant	Financial Consultant	1	47
5	Systems Analyst	Local government MTEF preparer	2	55
6	Consultant	Financial Consultant	1	62
7	Consultant	Financial Consultant	1	48
8	Consultant	Financial Consultant	1	48
9	Consultant	Financial Consultant	1	65
10	Accountant	Local government MTEF preparer	1	26
11	Accountant	Local government MTEF preparer	1	25
12	Consultant	Financial Consultant	1	57
13	Consultant	Financial Consultant	1	38
14	Consultant	Financial Consultant	1	54
15	Consultant	Financial Consultant	1	45
16	Accountant	Local government MTEF preparer	1	51
17	Accountant	Local government MTEF preparer	1	53
18	Auditor	Court of Accounts	1	60
19	Auditor	Court of Accounts	1	-- (1)
20	Auditor	Court of Accounts	1	-- (1)
21	Auditor	Court of Accounts	1	-- (1)
22	Auditor	Court of Accounts	1	-- (1)
23	Auditor	Court of Accounts	1	-- (1)
24	Auditor	Court of Accounts	1	-- (1)

Note. (1) These interviews were conducted asynchronously, via WhatsApp and e-mail

Finally, to clarify the authors' comprehension of the MTEF data collection mechanism and any discrepancies that may have arisen throughout the research, a triangulation of

information with auditors from 7 Courts of Accounts was made. We selected Courts that has DCS structured layouts for data collection of MTEF information in place. Contact with auditors was established in August 2022 via e-mail, followed by an time-lagged exchange of text and audio messages via WhatsApp. Time-lagged interviews are based on internet-mediated conversations, such as Whatsapp or email, but are not considered “instant messaging” as the exchange of text or audio messages are not expected to occur simultaneously (Schiek and Ullrich, 2017). This means that interviewees (and interviewers) have more time to gather resources (e.g., consulting legislation and documents) which are meaningful for the topic being discussed and was proved useful for quick confirmations (Beneito-Montagut *et al.*, 2017; Schiek and Ullrich, 2017). In one case, a remote follow-up interview was held via Zoom with DCS's developers of a particular Court of Accounts.

5. Findings

In this section, we bring evidence on how the informational structure (e.g., data layout) required by Court of Accounts data collection systems interferes with the scope of the MTEF in local governments. We start by describing the current scenario of automation of data collection for MTEF information in Brazil. Following, we bring qualitative evidence that the data collecting systems developed by governmental audit organizations affect the budget planning of local governments. This effect reduces local governments' autonomy in planning their MTEF (or choosing the most appropriate MTEF model to adopt) while generating internal budgeting practices decoupled from the information uploaded for audit purposes. At the end of this section, we discuss the motivations of Courts of Accounts when developing information systems that make MTEF information 'auditable'.

Current scenario of automation of data collection for MTEF information in Brazil

Despite the evolving digital infrastructure around the automated collection of data by Courts of Accounts (Aquino *et al.*, 2022a), Table 3 shows that the MTEF information has been collected electronically by only 50% of the Courts (15 of them). Among the Courts that develop a structured layout to collect MTEF-related data, most require MTEF information to be sent by local governments following the traditional model (14 out of the 15 Courts. Only one Court requests MTEF following an approach similar to the contemporary model (CoA-BA).

The year in which each Court of Accounts developed an automated system for collecting MTEF data via their DCS suggests that their efforts have not been coordinated, as the systems have evolved organically over the past decades. Moreover, several Courts of Accounts (14) do not have DCS for automated data collection regarding MTEF information. In these cases, Courts monitor this information through direct access to the financial information systems of the municipalities or by receiving data from the MTEF via PDF, without using structured data.

The table indicates that, for the Courts using automated collection, the municipalities follow the MTEF model imposed by the structured data collection layouts from Courts DCS. On the other hand, in the case of Courts that do not develop an automated collection of MTEF data, it can be noted the existence of different municipalities that chose to use the contemporary or traditional model – according to their planning autonomy. This observed effect is discussed in the following topic.

Table 3. Planning Models (MTEF) - computerization type in data collection

Court of Accounts - State	DCS implementation Year	There are DCS⁽¹⁾	MTEF model required by Court's DCS	State's capital' MTEF model in use	MTEF model in use in largest municipalities
CoA-MG	2002	Yes	Traditional	Traditional	Traditional
CoA -RJ	2002	Yes	Traditional	-- ⁽⁴⁾	Traditional
CoA -SC	2005	Yes	Traditional	Traditional	Traditional
CoA -PI	2007	Yes	Traditional	Traditional	Traditional
CoA -MT	2008	Yes	Traditional	Traditional	Traditional
CoA -SP	2009	Yes	Traditional	-- ⁽⁴⁾	Traditional
CoA -TO	2009	Yes	Traditional	Traditional	Traditional
CoA -GO	2009	Yes	Traditional	Traditional	Traditional
CoA -BA	2010	Yes	Contemporary⁽²⁾	Contemporary	Contemporary
CoA -ES	2013	Yes	Traditional	Traditional	Traditional
CoA -PR	2013	Yes	Traditional	Traditional	Traditional
CoA -MA	2014	Yes	Traditional	Traditional	Traditional
CoA -MS	2015	Yes	Traditional	Traditional	Traditional
CoA -RN	2016	Yes	Traditional	Traditional	Traditional
CoA -SE	2017	Yes	Traditional	Traditional	Traditional
Courts without data collection system of MTEF					
CoA -AC	--	No	N/A	Contemporary	Traditional
CoA -AL	--	No	N/A	Contemporary	Traditional
CoA -AM	--	No	N/A	Contemporary	Traditional
CoA -AP	--	No	N/A	Traditional	Traditional
CoA -CE	--	No	N/A	Contemporary	Traditional / Contemporary
CoA -PB	--	No ⁽³⁾	N/A	Contemporary	Traditional
CoA -PE	--	No	N/A	Contemporary	Contemporary
CoA -RO	--	No	N/A	Traditional	Traditional
CoA -RR	--	No	N/A	Traditional	Traditional
CoA -RS	--	No	N/A	Contemporary	Traditional / Contemporary
CoA -PA	--	No	N/A	Contemporary	Traditional / Contemporary
Courts with a single audited local government					
CoA -SP	--	Direct access	N/A		Traditional
CoA -DF	--	Direct access	N/A		Traditional
CoA -RJ	--	Direct access	N/A		Traditional

Notes. (1) The existence of DCS considers the transmission of structured data to the CoA, in files with XML or csv format, using a pre-established layout. (2) The system globally collects the values of the programs for the four years. (3) The CoA-PB stopped collecting data for the MTEF. (4) These state capitals are audited by a specific Court of Accounts.

Courts of Accounts' data collecting systems affecting local governments' budget planning

Brazilian legislation (specifically the Federal Constitution) guarantees autonomy for local governments in defining their scope of budgetary planning. The interviewees, those responsible for preparing this information in local governments, are aware of their autonomy and of the existence of different MTEF models. However, the Courts DCS influences the adoption of the traditional or contemporary model of the MTEF. For example, one interviewee

points out that even considering the budgetary planning autonomy guaranteed by the Constitution, the Court of Accounts' data collection system does not allow it.

Current legislation allows me to do something different [concerning budgetary planning], as the federal and state governments do, to do a little more generic planning [i.e., towards MTEF contemporary model]. For example, I could plan a year, and following, I plan all three subsequent years, which is more generic and strategic. However, nowadays, I cannot do this because the Court does not allow it. This rigidity impacts the innovation process to make something that makes more sense. (Interviewee 12).

Local governments are obliged to prepare the MTEF along the lines of the DCS required by the Court. "*When you are going to upload the [medium-term planning] information for accountability purposes, you already receive a standardized model from the Court, so the accounts are filled out in the Court's standard.*" (Interviewee 17). For example, suppose the Courts of Accounts' data collection system requires annual information by a government program (i.e., traditional model). In that case, this annual detailing should be observed by MTEF prepares in the local government. This prevents local governments from following a contemporary MTEF model, in which only the first year of the planning is detailed. This was evidenced in all interviews, for example:

Always before starting [planning], we check how they [the Federal Government] did it so that we can follow a methodology as close as possible to theirs. And the Federal Government made the last MTEF in a global [contemporary] way [...]. we tried to do this, but our Court of Accounts did not accept it; they asked us to separate the four budgets by year (Interviewee 10).

The Brazilian Federal government changed its MTEF model towards a contemporary model in 2012. However, Courts of Accounts started collecting planning data via their DCS in the early 2000s (see Table 3). Influenced by the manuals and handbooks available at the time, the DCS structured layout to collect MTEF information was designed around a traditional model – in which every year was detailed. This is an example of how Courts of Accounts acted to make the MTEF auditable (Power, 1996, 1999). As Courts DCS evolve following a path dependence trajectory (Aquino *et al.*, 2022a), there are usually no incentives to change the data collection layout structure. As shown in Table 3, nowadays, only one of the Courts analyses MTEF data in a computerized way using the contemporary model. Again, there is evidence that local governments are aware of the MTEF model developed by the Federal Government; however, it is impossible to follow the same model due to constraints arising from Courts of Accounts DCS.

The federal government has been developing the MTEF setting a financial target for the following year and then an overall financial target for the following three years. In the local governments, the common structure is for you to develop programs, actions and goals individualized by exercises [by year]. It could be different if it did not have the budgetary rigidity that the Court ends up imposing layouts of the DCS. The Court of Accounts asks for information about the program and the action separated by year, for example, I will upload the MTEF from 2022 to 2025 so the Court wants to know how much the local government will spend each year. If the local government does not do this, it cannot upload information, and this shapes behaviour and shapes the way of building [the planning of budget] (Interviewee 12).

In sum, when the Courts collect MTEF information in an automated way, local governments have to comply, as the data collection systems structure the way planning is developed, making no room for local governments to dissociate themselves from the required

model. In this way, the Courts are shaping the reporting format, affecting the choices of local government, which loses its autonomy. A digital infrastructure joining up local governments' financial management information systems and Courts of Accounts DCS emerges. In this environment, changes in the DCS layouts directly impact the input of information, not just the organization of the data to be transmitted, as the following passage shows.

The local governments already had a computerized accounting system, but it was not linked to the Court of Accounts. The local governments went through a validation phase of the systems, in which the Court released a layout of how the financial management information system should be, and each municipality, together with the technology team, began to develop this system in a way that it had a complete connection with the Court of Accounts [DCS]. (Interviewee 5).

On the other hand, some local governments reported being able to organize themselves to use other information for internal purposes, including mechanisms for controlling and evaluating budgetary programs, which goes beyond the minimum required by the Courts of Accounts. This brings evidence of local governments' decoupling response to the audit process requirements (Power, 1999), as shown in the following quotations.

We do not get stuck in the model from the Court of Accounts. I have a model to comply with [their demands], a minimum model, all the minimum information we have [to upload]. But we are lucky that the company that provides our system always values the improvement of the system [...] we ask for something and they implement it to give a better direction to our work. For example, the Court of Accounts does not ask for a qualitative evaluation of the programs, so we managed to create a[n] [internal] report for the evaluation of the programs (Interviewee 10).

However, this does not apply to all local governments, as there are indications that many of them do not have the material resources, training of civil servants, and budgets to invest in a system that better serves their needs. Additionally, when there is a law approving local governments' MTEF model that differs from what the data collection system of the Court of Auditors requires, the local government will have to develop a second version of the MTEF following Court's model to be able to upload the information through the DCS. This is not feasible due to the rework that public servants will have to develop planning instruments in two models. *"This is a possibility, but it ends up making the process difficult. People end up avoiding doing it because they already have so much work, so much responsibility, it is the law of minimum effort"* (Interviewee 12).

Courts of Accounts making MTEF information auditable

As previously mentioned, there is no general regulatory framework detailing MTEF content and form of elaboration in Brazil, despite the Federal Constitution requiring it as a mandatory rule for all levels of government. Courts of Accounts must inspect information on budgetary planning, including the MTEF development, as part of their mandate. Against this backdrop, documentary analysis and interviews with auditors from different Courts show that they started organizing themselves to make MTEF information auditable. Starting from developing manuals on how local governments should implement MTEF, over time, some Courts started to develop data collection systems to inspect this data (see Table 3).

However, the interview and asynchronous data collection with those responsible for developing the data collecting systems in selected Courts of Accounts indicate different levels of intentionality toward making MTEF information auditable (see Power, 1996). Moreover, it seems that with the increasing digitalization of audit processes, some Courts have started to

invest efforts in collecting and inspecting other information – i.e., changing the scope of audit towards other relevant fiscal and financial matters of local governments.

For instance, most of the Courts contacted stated that they were unaware of the MTEF contemporary model. In these cases, Courts keep collecting local governments' MTEF information on the traditional model embedded in their DCS developed decades ago. This is not an intentional decision at the present time, but a taken-for-granted assumption that it is the 'only' way to analyse MTEF information. For instance, the operational routines of the Courts are not challenged, and they continue to fulfill their mandate of collecting and monitoring the medium-term budgetary information from their auditees – following the traditional model. Meanwhile, it indicates that no internal discussions were taking place regarding innovation on inspecting this type of information and that the Courts had not received pressure (for example, from local governments) to adequate their DCS to receive MTEF information following the contemporary model.

At least one Court displayed an intentional approach to keep collecting MTEF information via structured layouts that follows the traditional model. The interviewee (18) points out that they are aware of different MTEF models in the country but do not see benefits in the contemporary model that would justify a change in the data collection system. In fact, they see that accepting local governments to follow the contemporary model of MTEF will make things 'less auditable'. They point out that the contemporary model mitigates the Court of Accounts' capacity to inspect intermediary goals and objectives from auditees and makes it impossible to compare the MTEF and the yearly budgetary law. The audit process would become more subjective if the model changes, and these auditors preferred not to accept this risk.

Moreover, auditors from some Courts are aware of a legislative bill proposing discontinuing MTEF information usage in Brazil. The main arguments that support this proposition are (i) the widespread perception of low-quality of information present on local governments' MTEF and (ii) the absence of a sponsor or coordinator of the MTEF (as discussed in Azevedo and Aquino, 2022). Again, taking advantage of this regulatory gap, the interviewees point out that Courts may require those local governments with up to 50,000 inhabitants (about 89.5% of municipalities in Brazil) to follow a more rigid structure for their MTEF. These local governments usually have constrained resources to prepare a high-quality medium-term plan (Azevedo and Aquino, 2016), and Courts see that by demanding standardized programs and key-performance indicators – still anchored on the MTEF traditional model – the overall quality of information can be increased. Meanwhile, other Courts appear to present a more resigned view on this issue. For instance, one Court decided to discontinue the electronic collection of MTEF data. Moreover, there is evidence that MTEF information collected via DCS may be only partially used in the audit process. For example, one of the Courts contacted revealed that the MTEF information is used only as an audit sampling criterion: "*nowadays, external control actions are more focused on controlling the budget itself [budget execution], with the MTEF information being used as a selectivity or prioritization criterion of audits*" (interviewee 22). Interviewees from another Court revealed that at the beginning of automatisisation, fines were applied if MTEF information was low quality, but recently the Court decided to focus on other information.

In a specific year, the Magistrates [Courts of Accounts judges that decides on the local government's accounts] analyzed the quality of the information [from the MTEF], leading to recommendations in the audit report. But then stopped, and even with all the problems and flaws still existing in the planning information, nothing appears on the audit report (interviewee 19).

The local governments have noticed the low use of MTEF information, which receives less incentives for improving the quality of information, as indicated by interviewee 3: "*The Court itself does not charge much [quality] for the indicators. So, if you put there, five schools, the Court does not question whether [the indicator] should be 5 thousand square meters, so if I carried out the construction of a school or five schools, it does not matter*".

6. Discussion

Our findings in the previous section point out that, in the absence of an explicit regulatory framework detailing MTEF practices, governmental audit organisations close the regulatory gap by implementing ways of making medium-term planning information 'auditable'. To this end, some Courts of Accounts developed structured layouts to collect MTEF information from local governments. In effect, the Court of Accounts' DCS ended up constraining budgetary planning practices on audited local governments – reducing their autonomy to choose the most appropriate MTEF model for their needs.

Following our findings, we offer a threefold contribution to the literature. First, our findings highlight the emerging public auditing digital infrastructure affecting practices within local governments (auditees). Previous literature on auditing overlooks the issue of digitalisation (Mattei *et al.*, 2021, Power, 2022), and recent studies focusing on emerging digital infrastructures focus on its impacts on auditors and audit organizations (Aquino *et al.*, 2022a; 2022b), being silent about potential changes on auditees behaviour and practices. As shown, the layouts for structured data collection in Courts of Accounts' DCS end up decreasing local governments' budgetary planning autonomy, constraining innovative practices, and ultimately leading to ceremonial adoption of the MTEF. In this case, local governments produce information about outputs from their government programs primarily for reporting – i.e., mainly considering external accountability purposes. In effect, local governments create controls and measurement systems to comply with audit expectations – i.e., to become auditable (Power, 1999), rather than to improve organisational outputs. These findings add to Petrakaki *et al.* (2009), which argue that digitalized monitoring may narrow down accountability and strengthen instrumental rationality – which does not necessarily lead to better public value. This affects how public policies are designed, which may be constrained by what is considered adequate in audit processes. Moreover, due to the digital audit society (Power, 2022), such impacts may escalate – since digitalisation increases auditing organisations' capacity to create environments in which they operate.

Second, our analysis contributes to the literature by highlighting that *who* is in charge of supporting and sponsoring public financial management reform matters. Previous literature stresses the need for strong leadership (by reform proponents, sponsors, or major supporting organisations) to support the successful implementation of public financial reforms such as MTEF (World Bank, 2012; Filc and Scartacini, 2010; Gourfinkel, 2022), performance-based budgeting (Mauro *et al.*, 2019; Currstine, 2005), internal control systems (Lino *et al.*, 2019), or broader budgetary reforms (Shah, 2007). For instance, Houerou and Taliercio (2002) contend that MTEF formulation effectiveness depends on centrally agreed-upon guidelines to standardise the organisational structure and sectoral outcomes. Thus, proponents, sponsors, or coordinators of reforms are expected to set clear guidelines and build up the institutional environment necessary for the reforms to thrive. However, the literature does not discuss the driving forces or motivations behind organisations supporting public financial management reforms. In the case at hand, it appears that when audit organizations take on the coordination role, their motivations are not always in line with the goal to improve the value of the MTEF information for governments (and/or citizens). Indeed, our findings point out that making information 'auditable' (see Power, 1996) is the driving force behind audit organisations' efforts

to coordinate the MTEF implementation in Brazil. However, local governments tend to comply with the audit requirements in a ceremonial way – decoupling the reporting of MTEF information from the core activities related to the budgetary process (Oliver, 1991; Power, 1999). This brings important practical implications to the implementation of public financial management reforms around the globe. For instance, whenever donors support a reform (as an aid condition, for instance), they must connect with governmental organisations within the recipient country that nurture the same motivations towards the reform's objectives.

Our third contribution, linked to the previous one, highlights the role of audit organisations as catalysts of reforms. Looking specifically at budgetary reforms, the literature points to the role of external auditors in the final step of the budget cycle, namely external scrutiny and auditing (Shah, 2007). Conversely, the broader literature on public financial management reforms acknowledges governmental audit organisations' role in enforcing and legitimating the reform goals (Shand, 2013; Aquino et al., 2020) or indicating in their reports governmental areas that should be restructured, i.e., triggering a reformist movement (Brusca *et al.*, 2016). The case of Brazil reveals an additional role for public audit organisations in reforms: in the absence of a sponsor and an environment with high interpretive flexibility (Power, 1996), public audit organisations may assume the coordination role. Our results add nuance to the studies showing the interconnection between (accounting) reforms and information technology development (Bekiaris and Markogiannopoulou, 2022) by indicating a 'silent' or 'creeping' form of MTEF's regulation by auditors through computerized data collection systems. On the one hand, adverse effects related to the audit illusion (Power, 1996, 1999) might emerge; for instance, when auditees start to conform to auditor requirements via decoupling (when a process is only ceremonial adopted for legitimization) or through colonisation (when audit "colonises" the organization and creates auditees to make its processes possible). On the other hand, as the emergent public audit digital infrastructure shapes organizational and individual action, it may support the institutionalisation of practices (see Gegenhuber *et al.*, 2022) since local governments become aware of the required changes and have access to minimal guidelines on how to implement the practices required by reforms. For instance, reforms may start as decoupled but evolve and become meaningful core organisational processes (Power, 2021). Overall, these impacts may be observed with caution since public audit organisations' drivers may not be aligned to the reform's goals – as discussed above.

7. Conclusions

Our paper analyses how data collection systems developed by governmental audit organizations affect budgetary planning within local governments. Our findings show that the budgetary planning autonomy of local governments in elaborating MTEF instruments is reduced when Courts of Accounts rely on the data collection system's structured layouts. This happens as the Courts of Accounts main driver is to make MTEF information auditable and not the improvement of the usefulness of information by governments. On the other hand, local governments audited by Courts that do not use data collection systems maintain their autonomy to define the MTEF model most suitable to their needs.

In the case we analysed, the current legislation does not impose a methodology nor give detailed guidance on the preparation of the MTEF. However, Courts of Accounts' DCS act standardising MTEF preparation, due to a structured layout to collect this type of information for audit purposes. In most of the cases, DCSs structured layout follows the *traditional* MTEF model. This ends up impacting local governments' budget elaboration – in effect, local governments do not have the autonomy to change their MTEF structure or follow alternative models that they perceive as more adequate for their needs. Although there are cases where local governments decouple the MTEF reporting from the actual internal use, this seems to be

not practical and requires resources not always available. In any case, the requirements by DCSs from Courts of Accounts make local governments aware of the need to develop MTEF information around some specific model.

As discussed, our results bring three main contributions to the literature. First, local governments practices are subtly and occasionally negatively impacted by emerging digital infrastructures on public auditing. Second, the drivers and motivations behind the organisation that sponsor or support public financial management reforms matters for the reform effectiveness. Third, we highlight the role of governmental auditing organisations as potential catalysts of reforms when "interpretive flexibility" is in place.

Our analysis raises important practical implications for the formulation of public policies and for the implementation of public financial management reforms. For instance, public policy formulation may be limited by what is deemed sufficient in complying to audit processes. Moreover, it seems that in order to bring effectiveness to public financial reforms, their sponsors and supporting organizations should have drivers for action that are aligned toward the main goals of the reform.

To complement our results, future research avenues may be needed. The use of digital tools by government audit organisations is still a process in its infancy (Mattei *et al.*, 2021), despite the tendency to explode due to the digital audit society (Power, 2022). Our article focuses on the analysis of audit organizations that use computerized data collection systems. However, given the current state of development of digitalisation, future research could analyse how non-automated audit process influences public financial management reforms – contributing towards an in-depth comprehension of audit effects on organisations beyond decoupling and colonisation (see Power, 2022). Moreover, there is a seemingly trade-off between local government autonomy and a comprehensive and detailed regulatory framework to support MTEF implementation (i.e., central coordination). On one hand there must be central coordination on the general structure of MTEF information; on the other hand, this coordination must not restrict governments budgetary planning autonomy. Future research could better explore this trade-off by proposing a typology of coordination versus autonomy.

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