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Accounting information sharing within buyer-supplier collaborations: Insights from a developing country

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Background: The significance of the context, or the environment, is pivotal in influencing the practices of management accounting.

Objectives: This article aims to explore the significance, methods and challenges of accounting information exchange in buyer–supplier collaborations.

Method: In buyer–supplier collaborations, data are gathered from 13 semi-structured interviews and 250 questionnaires. The analysis is conducted using SPSS version 25, employing non-parametric Kruskal–Wallis test and content analysis techniques.

Results: Respondents recognise its benefits but prefer informal communication. Challenges such as diverse systems and mistrust hinder formal sharing. Despite obstacles, informal channels remain effective, although concerns about data leakage persist, leading to a conservative approach.

Conclusion: In the Egyptian textile supply chain, members prioritise individual goals over collective ones. Informal methods, such as backdoor access, facilitate accounting information sharing among buyer–supplier partnerships. Formal sharing protocols are lacking, with limited one-way technical data exchange. Trust issues and data security concerns persist. Despite the absence of formal disclosure, cost estimations remain feasible. The company adopts a conservative approach, limiting access to records in most cases.

Contribution: In essence, the article not only sheds light on the complexities and nuances surrounding accounting information sharing in the textile supply chain but also emphasises the resilience of informal communication channels in overcoming challenges. As the industry navigates these dynamics, recognising the importance of relational ties and informal exchanges could be pivotal in fostering a more efficient and collaborative supply chain ecosystem.

Keywords: accounting information sharing; textile supply chain; Egypt; formal mechanisms; OBA.

Introduction

In recent decades, there has been a renewed interest in horizontal agreements among legally independent partners, evidenced by the proliferation of various inter-organisational relationships such as joint ventures, strategic alliances, partnerships, outsourcing and supply-chain collaborations (Matinheikki et al. 2022). The literature consistently highlights the limitations of traditional management accounting in addressing the complex interrelationships within such collaborations. The argument is that conventional accounting, confined within individual firm boundaries, provides minimal value in the context of buyer–supplier collaboration (Dekker et al. 2019).

Collaborations that blur organisational boundaries, reflecting an integrative philosophy, necessitate the development of inter-organisational accounting to effectively manage these intricate relationships (Yawar & Seuring 2017). In response to Hopwood's (1996) imperative to reorient firms towards a perspective that transcends traditional hierarchical structures, a considerable body of academic scholarly literature has undertaken an exploration of the ramifications for accounting within collaborative environments (Kornberger, Pflueger & Mouritsen 2017). Information sharing is crucial in integrated supply chain management (Maskey, Fei & Nguyen 2019). Conventional management accounting focuses on hierarchical information for control and decision-making (Fliegner 2015), but it is insufficient for the interconnected dynamics of supply chains. Management accounting has shifted from internal to inter-organisational information sharing across the supply chain. The literature suggests that accounting

information sharing is influenced by the specific context (Agndal & Nilsson 2023; Diab et al. 2020; Phan et al. 2023).

Accounting information sharing within a firm manifests in diverse forms and serves multiple objectives, including financial reporting, cost analysis, internal control implementation, performance evaluation, inventory management and more. In less developed countries with informal institutions, management control processes differ from stable contexts. Formal management control systems emerge as complexity increases (Phan et al. 2023). Agndal and Nilsson (2023) argue that the extent of accounting information sharing depends on the domain. In low-trust contexts, sharing is limited, while high-trust contexts encourage free data exchange. Relational social norms prevent opportunistic exploitation of disclosed cost data (Möller & Windolph 2012). Agndal and Nilsson (2023) advocate analysing domain-specific trust and distrust for data sharing among supply chain partners.

Integrated IT systems enhance communication and information exchange (Phan et al. 2023), contingent on partners' willingness to disclose financial information. Context matters, examined in dyadic connections or broader supply-chain networks (Håkansson & Lind 2007; Lind 2013). Firms prefer revealing cost data to those directly influencing them (Biswas et al. 2023). Open-book accounting (OBA) focuses on sharing cost data within the supply chain, as identified in various studies (Fayard et al. 2012). Open-book accounting is often viewed as a means to identify improvement areas and cost-saving opportunities through collaborative efforts among supply-chain partners (Möller, Windolph & Isbruch 2011). It is acknowledged for enhancing supply-chain relationships by fostering cooperation, trust and commitment (Lima et al. 2023). However, the alignment of normative perspectives with actual practices is questioned, especially without robust empirical evidence (Agndal & Nilsson 2010, 2023). Implementing OBA is more challenging in network settings unless a firm serves as a nodal point, as seen in cases of multiple bilateral contracts (Caglio & Ditillo 2012).

It is noteworthy that studies exploring factors influencing supply chain partners' information-sharing decisions have predominantly been conducted in developed countries, particularly in the United States of America (Maskey et al. 2015). Limited research in small and least-developed countries suggests that the concept of supply chain management is still in its infancy in developing and underdeveloped nations (Jia et al. 2018; Phan et al. 2023). The article aims to explore the significance, mechanisms and challenges associated with information exchange within the buyer–supplier collaborations embedded in the Egyptian textile supply chain. The focus of this investigation lies particularly in contexts where informal relationships and traditional management accounting methods dominate, with a specific emphasis on OBA.

The existing literature on OBA offers limited insight into the level of formality regarding the cluster at which data disclosure procedures occur, whether formal or informal. In this regard, OBA practices may be formally integrated within a routine control system where the responsibilities of both buyers and suppliers are clearly defined (Kumra, Agndal & Nilsson 2012). Similarly, Agndal and Nilsson (2023) posit that the realm of cost management represents the formal environment in which information is exchanged. Consequently, OBA is perceived as an inter-firm accounting practice that facilitates inter-organisational cost management (IOCM) by disclosing cost data among supply chain partners to regulate inter-organisational activities and enhance supply chain efficiency (Windolph & Möller 2012).

Egypt's textile industry enjoys a global reputation, standing as the country's second-largest sector. It contributes 30% to industrial production, 10% to total exports and accounts for 3.4% of GDP. Egypt hosts the sole fully vertically integrated textiles industry in the Middle East, encompassing the entire production cycle from cotton cultivation to yarns, fabrics and ready-made garments, all conducted domestically.[1]

The perspective of the supply chain may vary depending on the viewpoint of each of its members, as each member typically considers their own company as the central focal point (Lambert & Cooper 2000). Given that a supply chain comprises all companies involved in direct and indirect interactions from the point of origin to the point of consumption, it is crucial to pinpoint the focal point where inter-organisational relationships are to be examined and explained from that vantage point. The textile industry involves complex relationships across various tiers. To simplify the investigation and understand inter-organisational dynamics, we adopt a direct supply-chain approach. This method focuses on the flow of production and information among three key partners: an immediate supplier, a manufacturing company and a customer. The study designates the manufacturing company as the focal entity, serving as the primary unit of analysis. The focal company, namely the spinning and weaving company, is responsible for producing yarns, fabrics and ready-made garments. Data are presented from the perspective of this focal company.

Information pertaining to the significance, mechanisms and barriers of accounting information shared within buyer–supplier collaborations is gathered through 250 questionnaires and 13 semi-structured interviews. The data collected through the questionnaire are analysed using the Statistical Package for Social Sciences (SPSS) version 25, while the semi-structured data are analysed through manual coding techniques.

The findings reveal that, despite the establishment of long-term relationships with various customers and suppliers within the Egyptian textile supply chain, individual chain members tend to maintain a singular vision based on their specific circumstances, rather than seeking a collective vision for the

1.See https://www.enicbcmed.eu/egypt-crective-project-highlights-significance-innovation-competitiveness-textile-leather-and and also see https://www.egytexfairs.com/why-egypt/

entire chain. Informal mechanisms, such as accessing accounting information through backdoors, are employed to gather necessary information. While explicit accounting information sharing practices, as defined in the literature, are not observed within the company, there are underdeveloped forms of such sharing. The predominant form involves one-way sharing of technical information from customers to the company.

Several factors contribute to this approach. Firstly, the concept of trust is not robust among supply chain partners, as the company is concerned about the potential leakage of data to competitors. There is also apprehension that other partners in the chain might exploit shared data to negotiate lower prices for the company. Secondly, even though the company does not formally disclose cost data, it can be easily estimated or obtained through informal means. The price of raw cotton, for instance, is publicly available, allowing partners to estimate the costs of further processing activities within the company and predict its profit margins. Additionally, with the entry of the private sector into the Egyptian textile industry, information proxies and espionage have made obtaining cost data more accessible. In general, the company adopts a conservative approach, keeping its records closed to clients except in specific cases.

The finding contributes to the literature by shedding light on the intricate relationships and challenges within the Egyptian textile supply chain, highlighting a divergence between the existence of long-term relationships and the lack of a collective vision among chain members. The reliance on informal mechanisms, such as backdoor access to accounting information, to gather necessary data underscores the complexity of information sharing practices. The identified factors contributing to limited sharing, particularly the lack of robust trust among supply-chain partners, and the fear of potential exploitation or data leakage, provide valuable insights into the dynamics of collaboration in the textile industry. Furthermore, the conservative approach of the company in keeping cost data and profit margins confidential, except in specific cases, reflects a cautious stance that has implications for transparency and cooperation within the supply chain.

The structure of the article is delineated as follows. The 'Literature review' section outlines the concept of accounting information sharing within dyadic relationships between buyers and suppliers, subsequently formulating hypotheses. Section Hypotheses development presents the research methods employed in this study Section Methodology encompasses data analyses and a discussion of the study's findings. Lastly, Section Discussion and results provides a summary of concluding remarks.

Literature review

Open-book accounting is integral to identifying cost reduction opportunities by sharing cost data among supply chain partners (Kajüter & Kulmala 2005; Lima et al. 2023). While not a cost management tool, OBA aligns with formal cost management practices. Inter-organisational cost management efficiently manages costs across supply-chain interfaces by coordinating efforts to uncover cost-reduction opportunities beyond individual firms (Hoffjan, Lührs & Kolburg 2011). It applies traditional cost management principles in an inter-organisational supply chain context, aiming to optimise combined resources (Fayard et al. 2012; Möller et al. 2011). Researchers explore inter-organisational applications of tools such as budgeting, target costing and activity-based costing, emphasising the need for high-quality information sharing (Narouei et al. 2023). Inter-organisational cost management introduces formal tools such as chained target costing and functionality-price-quality trade-offs during product development (Kulmala 2002).

Open-book accounting supports IOCM tools, especially those relying on buyers' awareness of suppliers' cost structures (Agndal & Nilsson 2010; Hoffjan et al. 2011). However, OBA does not always lead to joint cost management activities (Möller et al. 2011), and certain IOCMs may not involve direct cost data discourse (Hoffjan et al. 2011). The literature on OBA should delve into the formality of data disclosure procedures, whether in formal or informal clusters. Open-book accounting practices may integrate formally into routine control systems, contributing to inter-firm accounting practices that enhance supply-chain efficiency (DhaifAllah et al. 2016).

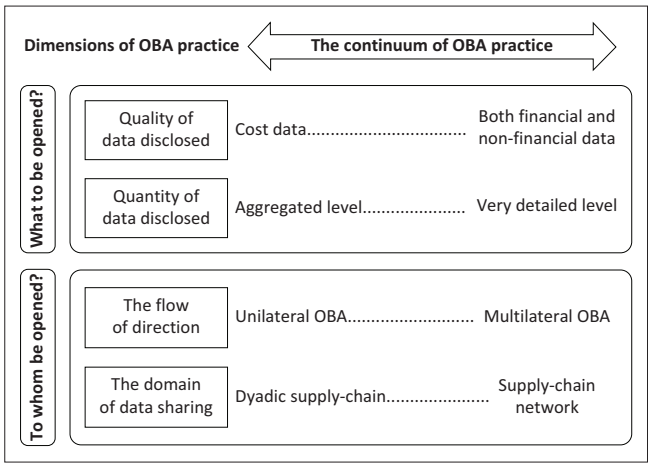
The notion of openness in open-book accounting

Open-book accounting, as argued by Colicchia et al. (2019), primarily revolves around the sharing of cost data among supply-chain partners. Within the literature, it is often depicted as a tool for pinpointing areas for improvement and identifying opportunities for cost savings through collaborative efforts among these partners (Fehr & Rocha 2018). Furthermore, OBA has the potential to enhance supply-chain relations by fostering cooperation, trust and commitment among partners (Colicchia et al. 2019). However, the question arises as to whether this idealised portrayal of OBA aligns with real-world practices, particularly given the dearth of empirical evidence supporting these assertions (Agndal & Nilsson 2023). The answer to this question is not straightforward, but a review of the literature can provide some insight into exploring the extent of openness within OBA.

Given the limited empirical findings regarding OBA practices, it is conceivable to consider various interpretations of openness. Open-book accounting practices can be seen as existing along a continuum, with differing degrees of openness depending on how these practices are implemented. As depicted in Figure 1, the concept of openness can be examined from various dimensions, including what information is shared and with whom it is shared.

What information is shared via open-book accounting

The literature on OBA reveals a wide spectrum of interpretations regarding what should be opened up. This



OBA, open-book accounting.

FIGURE 1: The continuum of the notion of openness in open-book accounting.

can be approached from two angles: the first concerns the nature or the quality of the data to be disclosed, while the second pertains to the quantity of the disclosed data. Some scholars advocate for a narrow perspective, suggesting that only financial information, particularly cost data, should be shared (Hoffjan et al. 2011). Conversely, others take a broader view, arguing that various types of data should fall under the umbrella of OBA (Romano & Formentini 2012). The core argument posited here is that companies cannot effectively enhance their supply chains without access to detailed information about their partners' resources and activities, encompassing aspects such as costs, revenues, quality, cycle time, reliability and delivery (Lima et al. 2023; Purwaningsih et al. 2024). Thus, the disclosed information may span a wide range, including details about cost structures, setup times, inventory levels, turnover rates and sales forecasts. A more expansive understanding of inter-organisational information encompasses all business-related data, including accounting details such as quality, pricing, delivery issues, R&D capabilities, cost structures and target costs (Lima et al. 2023). Additionally, considerations extend to quality and environmental information, projected investment plans and product development programmes (Kumra et al. 2012).

The second perspective pertains to the quantity or level of detail at which data are shared. Empirical findings suggest that in practice, the disclosed data may vary from aggregated levels, such as total cost data or selected cost items such as direct material costs, to more in-depth information organised in cost tables detailing each component and operation as reflected in the internal accounting system (Kumra et al. 2012).

To whom open-book accounting is opened?

The concept of openness in OBA can also be examined from two additional perspectives. Firstly, it involves considering the direction of the flow of disclosed data, which essentially addresses the question of who initiates the disclosure. When only suppliers open their books to buyers, this is termed unilateral one-way cost data disclosure or open book costing (Fehr & Rocha 2018), whereas multilateral OBA or cost transparency occurs when cost information flows in various directions (Caglio & Ditillo 2012). Empirical evidence suggests that unilateral one-way data disclosure from suppliers to buyers can lead to unfavourable consequences for both parties. Suppliers may risk their cost structure data being exploited during price negotiations by buyers, who may base their negotiations on theoretical cost structures or threaten to share the data with competitors (Fehr & Rocha 2018). Conversely, buyers risk damaging their reputation and reducing suppliers' willingness to collaborate, leading to instances of opportunistic behaviour on both sides. To mitigate these risks and ensure fair sharing of benefits, it is recommended to adopt a multilateral version of OBA. Unlike unilateral OBA, cost transparency involves a mutual agreement for the joint sharing of benefits and risks. This entails an understanding of how the disclosed data will be used, allowing all parties to align their improvement plans for mutual benefit.

Another aspect of analysing OBA practices involves considering the scope within which partners are willing to share their financial information. This perspective focuses on the domain of inter-firm relationships and can be categorised into two main levels: the dyadic buyer–supplier relationship or the broader supply-chain network.

The literature on inter-organisational accounting often explores vertical collaborations between purchasing firms and their suppliers. These relationships are typically marked by extended durations, the participation of individuals with diverse functional specialities, and endeavours to align product features, production processes and logistical activities (Desai 2023). Within this context, OBA emerges as a prominent inter-organisational accounting practice that contributes to the success of such relationships. Depending on the nature of collaboration, dyadic relationships may vary across cases, considering factors such as the formality of inter-organisational agreements, the duration of collaboration and the degree of inter-relationship among collaborating companies (Lima et al. 2023).

Inter-firm relationships evolve through stages: autonomy to serial dependence, serial dependence to reciprocal dependence and reciprocal dependence to mutual dependence (Gurcaylilar-Yenidogan & Erdogan 2023). Table 1 illustrates the alignment of OBA practices as an inter-organisational technique alongside these stages of maturity in supply-chain relationships. Open-book accounting practices align with these stages in supply-chain relationships, emphasising OBA's role in facilitating collaboration. Unidirectional OBA, observed in serial dependence, shows power asymmetry. Empirical studies focus on this version, limiting supplier rights. Advancing to reciprocal dependence allows increased accounting information sharing among partners. A matured OBA phase supports collaboration, involving multifunctional teams managing supply chains. The progression to ideal supply-chain relationships may involve an ideal OBA. Lima et al. (2023) found that OBA can enhance trust and collaboration in mutual dependence relationships, but challenges may arise because of weaknesses in firms' internal cost systems.

TABLE 1: Open-book accounting practices related to dyadic interfirm relationships.

Stages of maturity in interfirm relationships	Detected OBA practices
• **Autonomy**	No observed practices of OBA
• **Serial dependence**	Unidirectional OBA (Customer power dominance)
• **Reciprocal dependence**	Matured version of OBA for mutual benefits

OBA, Open-book accounting.

Textile industry in the Egyptian context

Egyptian cotton is renowned globally for its exceptional qualities, attributed to the fertile soil along the Nile River and the surrounding humid climate. However, the reputation suffered because of a lack of effective quality assurance systems by local seed companies, resulting in subpar and mixed variety cotton output (Aslam et al. 2020). To restore the esteemed reputation, the Egyptian Ministry initiated a comprehensive 19-step plan in early 2017. The government took control of cottonseed production and distribution, previously managed by the private sector. Egyptian cotton farmers now participate in dedicated cotton auctions, with recorded prices ranging from $182 to $257 per quintar as of February 2023. Before the auction system, average prices were around $82 for lower-long staple cotton and $163 for upper-long staple varieties.[2]

Egypt boasts the Middle East's only fully vertically integrated textiles industry, covering the entire production cycle within the country's borders, from cultivating cotton to manufacturing yarns, fabrics and ready-made garments. Private companies, particularly in ready-made garment production, have entered the industry, while the public sector predominantly owns spinning (50%) and weaving (60%) in upstream processes. Downstream, ginning companies, whether public or private, separate seeds from cotton plants. Public ginning companies exclusively procure cotton from local farmers, while private entities have the option to buy locally or import raw cotton for further processing by spinning and weaving companies.

The Egyptian textile industry's supply chain is characterised by complex relationships among various partners. To simplify this complexity, the study adopts a direct supply-chain approach, as illustrated earlier in Figure 2. In this simplified model, the ginning company sells ginned cotton to the spinning and weaving company (the focal company), which is responsible for producing yarns, fabrics and ready-made garments. The focal company then distributes its final products to local or international fashion companies (the customers). The research primarily focuses on analysing the focal company as the central unit of study.

Objectives of the study

The main objective of the study is to investigate the perceptions of multiple employees at the focal company in the textile supply chain regarding several aspects of accounting information sharing. Specifically, the study aims to address the following research questions:

1. What are the perceptions of employees within the focal company regarding the importance of accounting information sharing?
2. What methods are employed for accounting information sharing within the textile supply chain?
3. What are the key hurdles and obstacles encountered in accounting information sharing throughout the supply chain?

Hypotheses development

Tracking the literature around the tendencies of sharing accounting information among the collaboration of supply chain reveals that many issues are not yet settled and need further examination. It remains questionable how accounting information sharing affects the performance of supply chain partners (Kankam et al. 2023); how accounting information is shared (Agndal & Nilsson 2023) and what are the main challenges that hinder the sharing of accounting information within the whole supply chain (Basu 2023).

The importance of accounting information sharing among supply chain partners

A conclusive understanding of the impact of sharing accounting information on supply-chain partner performance remains elusive. In dyadic relationships, conflicting results emerge. Carr and Ng's (1995) findings suggest positive outcomes for Nissan car producer suppliers, as cost data disclosure enables them to justify higher prices and benefit financially. Wagner (2008) contends that high-performing companies intensively implement accounting information sharing compared with low-performing ones. Reliable information is vital for effective supply chain activities (Adaa et al. 2021).

Trust-building can lead to positive outcomes, reducing governance costs, optimising relationship investments, expanding inter-organisational activities and enhancing overall supply chain performance (Lima et al. 2023). Similarly, Kankam et al. (2023) assert that quality information enhances coordination, fostering synergy and positively impacting overall supply chain performance. Phan et al. (2023) accentuate the role of accounting information sharing in enhancing supply chain performance.

Conversely, literature acknowledges the negative impact of unilateral accounting information sharing on supply-chain partner satisfaction, especially among suppliers. One-sided OBA is criticised for enabling buyers to opportunistically misuse suppliers' disclosed cost data, potentially reducing profit margins (McIvor 2001). Kajüter and Kulmala (2005) suggest that suppliers derive fewer benefits than customers from accounting information sharing. Windolph and Möller (2012) highlight the relational damage caused by cost data disclosure because of recurring buyer opportunistic practices.

2.See https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Cotton%20and%20Products%20Annual_Cairo_Egypt_EG2023-0004.pdf

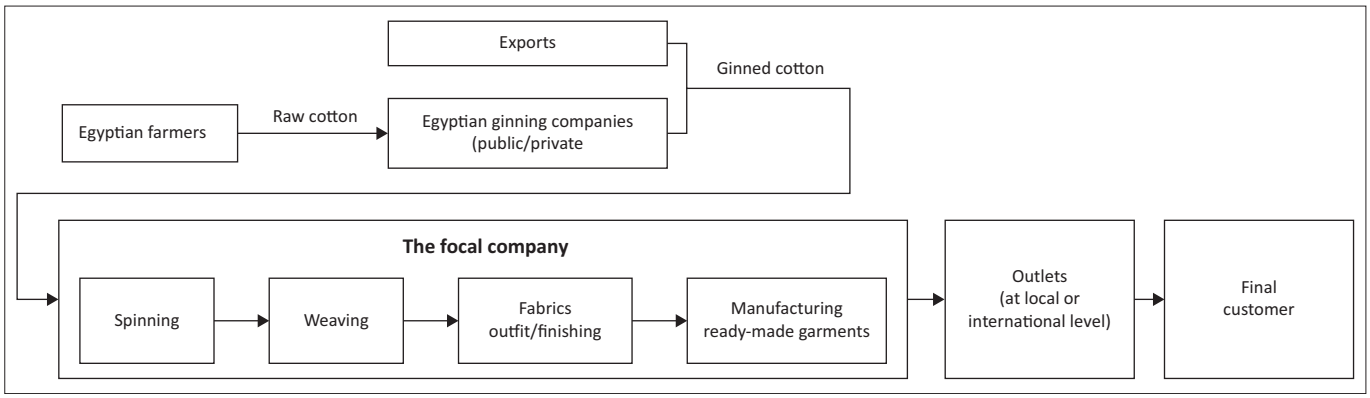


FIGURE 2: The direct supply-chain.

There is a clear absence of a definitive conclusion regarding the effects of accounting information sharing on the performance of the supply chain. Literature lacks a dominant voice supporting or refuting the positive consequences of OBA. The value of cost transparency, as argued by Lamming et al. (2001), relies on reciprocal and justified information sharing, rather than strict symmetry. Therefore, the outcomes of accounting information sharing may depend largely on how it is applied. Accordingly, the first hypothesis is formulated as follows:

> H_0: Job roles of employees at the focal company has no effect on their perceptions towards the importance of accounting information sharing between supply chain members.

The mechanism through which accounting information is shared among supply chain

The literature reveals that most findings regarding OBA pertain to dyadic settings rather than network environments. Incentives for OBA often revolve around enhancing cost-reduction efforts and increasing cooperation levels between suppliers and customers (Agndal & Nilsson 2008; Carr & Ng 1995; Hoffjan et al. 2011; Windolph & Möller 2012). In practice, the partner with the strongest financial position tends to derive most of the realised potential benefits (Windolph & Möller 2012). To mitigate unfavourable consequences, many supplier–customer relationships are built upon the implementation of win-win principles (Kajüter & Kulmala 2005; Suomala et al. 2010).

The use of a multilateral version of OBA is crucial under this principle, requiring both customers and suppliers to open their books to ensure a fair distribution of benefits on agreed terms (Yarbrough & Yarbrough 2014). Such an agreement is effective only if reliable cost information is available (Lima et al. 2023).

Given that informality is a notable characteristic in many developing or emerging economies, as highlighted by Diab et al. (2020), such as Egypt, it is anticipated that within the textile supply chain, informal methods of disseminating accounting information may be more dominant than formal approaches. Consequently, we articulate the hypothesis in its alternative form:

> H_1: Individuals in varied roles within the focal company prioritise informal mechanisms over formal ones for sharing accounting information within the supply chain.

The hurdles of sharing accounting information among supply chain partners

A comprehensive examination of the literature on challenges associated with sharing accounting information among supply chain partners reveals several key themes. Firstly, deficiencies in information systems and cost systems at certain chain partners can impede data sharing at the supply chain level (Kembro, Näslund & Olhager 2017). Even if suppliers are willing to disclose their financial information, their ability to generate the necessary cost data depends on the status of their cost accounting systems and their adherence to quantitative and qualitative standards for shared data (Kajüter & Kulmala 2005). Additionally, differences in accounting systems among supply chain partners may hinder OBA, making the interpretation of cost structures challenging because of variations in cost definitions and treatments (Kajüter & Kulmala 2005; McIvor 2001).

Secondly, the technical shortcomings of cost systems pose another challenge (Kembro et al. 2017). While there is limited knowledge of how OBA operates in practice, studies suggest that having sound cost accounting systems is crucial for successful OBA implementation (Kajüter & Kulmala 2005; Kulmala, Paranko & Uusi-Rauva 2002). The existence of mutual trust between partners is considered as important as having robust cost accounting systems for the ideal practice of OBA (Kajüter & Kulmala 2005).

Thirdly, the presence of mistrust between chain partners can hinder the sharing of accounting data (Agndal & Nilsson 2023). Research findings are divided into three sets, with the majority emphasising that the adoption of OBA requires a foundation of trust between collaborative partners (Agndal & Nilsson 2008, 2023; Hoffjan et al. 2011). A second set of researchers suggests that OBA can be a tool to build trust within supply chain collaborations (Lima et al. 2023). The third set argues that trust has consequences for OBA, with a minimum level of trust needed to introduce OBA, and over time, the practice of OBA contributes to the level of trust (Fayard et al. 2012; Kulmala 2002, 2004).

Fourthly, insufficient cooperation among supply-chain partners complicates data sharing (Lima et al. 2023). Building trustworthy relationships among supply-chain partners is a critical challenge that requires time and collective efforts, involving factors such as the willingness to take risks and engage in close interactions, and a long-term history of fair treatment and commitment (Dekker et al. 2019).

In the light of these findings, the literature highlights various challenges in sharing accounting information among supply chain partners, and these themes may vary in importance based on the perspectives of employees at different stages in the focal company. Consequently, the third hypothesis can be formulated as follows:

> H_0: Employees with different roles at the focal company apply equal importance to the hurdles for sharing accounting data among supply chain members.

Methodology

Unit of analysis: The focal company

The textile industry chain is complex, involving intricate relationships across various partners. As illustrated earlier in Figure 2, the research adopts a direct supply-chain approach. This approach focuses on the streamlined flow of production and information among three interconnected partners: an immediate supplier, a focal company and a customer. The focal company then sells its finished products to local or international fashion companies (the customers). The research primarily analyses the focal company as the unit of study, presenting all collected data from its perspective. This focused approach enables a more in-depth exploration of supply-chain dynamics.

Methods

To conduct a more comprehensive investigation into the mechanisms of accounting data sharing, mixed data collection methods are employed.

Firstly, we employed a questionnaire to gather data regarding respondents' perceptions concerning the importance, methodologies and obstacles related to the accounting information exchange within the textile supply chain. In Egypt, our research targeted employees within the textile industry, particularly those engaged in supply chain processes related to the focal company. The textile manufacturing sector in Egypt displays fragmentation, with a limited number of dominant companies[3] collectively employing approximately 1.8 million individuals.[4] To ascertain the total population, we relied on official records and industry reports. Our sampling encompassed individuals across various departments including production, procurement, logistics and management roles within the focal company's textile supply chain. From this pool, we selected a sample of 250 respondents, prioritising those with accessible email addresses. This approach ensured a representative sample while optimising the feasibility of data collection. Following the receipt of responses, we excluded incomplete and invalid submissions, resulting in 140 valid questionnaires. This process yielded a response rate of 56%.

Respondents' opinions were evaluated using a five-point Likert scale. The questionnaire comprised two main sections. The first section explored respondents' demographic attributes, covering variables such as gender, age, education, professional tenure, occupational designation and familial associations. The second section focused on the perspectives of numerous employees in the textile supply chain, specifically addressing the significance, challenges and impediments related to accounting information sharing across the entire supply chain. Egyptian auditors used a Likert scale, ranging from one for minimal importance to five for utmost significance, to discern and rank their perceptions in this context.

The collected data were processed using the SPSS version 25. A reliability test was conducted on the collected data using Cronbach's alpha model to assess the internal consistency of the questionnaire based on the average inter-correlation among items. The alpha coefficient, at 0.95, indicates a relatively high level of internal consistency. Consequently, the reliability test results confirm the high reliability of the questionnaire design and the collected data.

In the study, non-parametric tests are favoured for their flexibility with various data distributions, particularly in handling small samples and nominal, ordinal or ranked data. The Kruskal–Wallis test is used to analyse questionnaire responses, aiming to uncover significant differences among respondents at different production stages in the supply chain cycle. This analysis investigates the implications of accounting information sharing within the textile chain.

Secondly, we conducted semi-structured interviews with employees from the focal company to gain additional insights into their perceptions regarding the sharing of data, as well as to explore the significance and obstacles associated with data sharing. In semi-structured interviews, a set of core questions is consistently posed to each interviewee, allowing for flexibility in altering the question sequence or phrasing based on the interviewee's responses. This approach fosters a positive rapport between the interviewer and interviewee and contributes to a favourable response rate (Dunwoodie, Macaulay and Newman 2023). Specifically, the study involves 13 semi-structured interviews with individuals occupying various hierarchical positions at different production companies.[5]

3.See https://www.mordorintelligence.com/industry-reports/egypt-textile-manufacturing-industry-study-market

4.See https://www.egypt-business.com/companylist/details/2312-top10-textile-companies-in-egypt/426994

5.These interviews encompass the manager of the purchasing department (ginned cotton), head of the computer sector, head of the spinning sector, manager of spin 2 factory, head of the finishing sector, manager of the finishing factory (fabrics dying), manager of the finishing company (order accomplishment), head of the centralised control sector, quality control engineer rank one, production engineer rank one, the director in the packing department and two workers at spin 2 factory, along with two sales managers.

They focused on participants' experiences, perceptions and observations, with open-ended questions allowing for elaboration. Interview sessions were conducted in person or virtually, based on participant preferences, lasting approximately 30 min each.

The interviews were originally conducted in Arabic. The data collected were subsequently transcribed into Arabic and later translated into English. For analysis, a manual coding method was employed, facilitating the identification of insights pertinent to the core of the research. This approach also enables researchers to tailor the coding process to the specific research questions and objectives (Linneberg & Korsgaard 2019).

Discussion and results

Descriptive statistics

Table 2 provides descriptive statistics detailing the frequency and percentages of demographic characteristics of respondents. This descriptive overview provides a comprehensive snapshot of the respondents' demographics, shedding light on gender distribution, age ranges, educational qualifications, years of experience, job roles, job titles and familial ties within the surveyed population. From a gender perspective, the majority of respondents are male, comprising 91% of the total, with females constituting only 9%. Age distribution reveals that over 40% of respondents are under 30 years old, over 45% fall within the 30- to 50-year age range, while only 13% are aged 50 and above, indicating a diverse age profile among respondents.

In terms of educational qualifications, 61% of respondents do not hold a university certification. The distribution of respondents based on years of experience shows that the largest group, at 31%, has 11–15 years of experience. The remaining experience categories exhibit a relatively balanced distribution, showcasing varying proportions.

Examining job roles within the specified supply chain processes, there is an equitable distribution among respondents in various roles: spinning (17%), weaving (16%), Fabrics outfitting and finishing (23%), manufacturing ready-made garments (17%) and other (27%). Analysing job titles, individuals with the job title of Engineer or Chemist constitute the largest proportion, making up 24% of the total. In terms of maintaining familial ties with colleagues, 78% of respondents affirmed that they do, while 22% indicated that they do not.

TABLE 2: The demographic characteristics of the sample respondents' participants.

Demographic characteristics	Frequency	Percentages
Gender		
Female	12	9
Male	128	91
Subtotal	140	100
Age		
Less than 30 years old	58	41
30–40 years old	38	27
40–50 years old	26	19
Over 50 years old	18	13
Subtotal	140	100
Educational qualifications		
Bachelor's degree	49	35
Postgraduate (Diploma, Master or PhD)	6	4
Other	85	61
Subtotal	140	100
Years of experience		
1–5	40	29
6–10	22	16
11–15	44	31
16–20	24	17
Greater than 20	10	7
Subtotal	140	100
Job roles (supply chain processes)		
Spinning	24	17
Weaving	22	16
Fabrics outfitting and finishing	32	23
Manufacturing ready-made garments	24	17
Other	38	27
Subtotal	140	100
Job title		
General manager	25	18
Sector manager	15	11
Department manager	29	21
Engineer or Chemist	33	24
IT Specialist	10	7
Accountant	28	20
Subtotal	140	100
Maintaining familial ties with fellow colleagues engaged in the supply chain		
Yes	109	78
No	31	22
Subtotal	140	100

Discussion

Respondents were surveyed to gauge their perception of the significance of sharing accounting information among supply chain members. Table 3, panel 1 reveals that over half of the respondents acknowledged the positive impact of enhancing the exchange of accounting information in a supply chain, leading to improved product quality, including responsiveness to customer requests, on-time delivery, efficient ordering and increased customer awareness. In addition, an equal percentage of respondents (65.7%) affirmed that sharing accounting information among chain partners promotes trust and cooperation, and reveals cost reduction opportunities at both intra and inter-firm levels.

The Kruskal–Wallis's test, detailed in Table 4, panel 1, indicates unequal mean degrees of importance regarding the perception of sharing accounting information among employees with different roles at the focal company. The Chi-square values for the mentioned themes (ranging from 3.175 to 5.219) surpass the tabulated Chi-square value of 2.59 at a 0.05 significance level, with 4 degrees of freedom (DF). Consequently, the null hypothesis that employees with different roles at the focal company assign equal importance to accounting information sharing among

TABLE 3: The respondent's opinions regarding the tendencies of accounting information sharing.

Themes	Percentages of frequency		
	Strongly agree	Neutral	Strongly disagree
Panel 1: The role of accounting information sharing in enhancing the supply chain's overall performance			
I1: Sharing accounting information among supply chain partners improves the quality of products in various aspects such as responsiveness to customer requests, punctual delivery, ordering efficiency and heightened customer awareness.	60	35.2	4.8
I2: Accounting information sharing enhances the level of trust and cooperation between supply-chain partners.	65.7	34.3	0
I3: Accounting information sharing leads to perceptible cost reductions at both firm and chain levels.	65.7	28.6	5.7
I4: Others	2.9	2.9	94.2
Panel 2: The mechanisms by which accounting information is shared among supply chain partners			
M1: Building an integrated information system is necessary to satisfy the information needs at supply chain level.	65	28	7
M2: Accounting data can be shared via and only via formal condoms such as integrated information systems or OBA.	20	15	65
M3: Informal relationships could facilitate accounting data sharing.	72	15	13
Panel 3: Hurdles of sharing accounting information within the supply chain			
H1: A lack of information systems and cost systems at some of the chain's partners.	80	14.3	5.7
H2: Technical deficiencies: Facilities to share needed data do not exist.	65.7	34.3	0
H3: The notion of mistrust between the chain partners	80	20	0
H4: A lack of cooperation among supply-chain partners	82.8	17.2	0
H5: Other factors.	80.6	0	19.4

OBA, Open-book accounting.

TABLE 4: The tendencies of accounting information sharing: Kruskal–Wallis test.

Tendencies of accounting information sharing	Chi-square	DF	Sig.
Panel 1: The importance of sharing accounting information in the supply chain			
I1: Sharing accounting information between supply chain partners enhances the supply chain's overall performance.	3.175	4	0.000
I2: Sharing accounting information enhances the level of trust and cooperation between the supply chain's partners	4.371	4	0.001
I3: Sharing accounting information leads to perceptible cost reductions at both firm and chain levels.	5.219	4	0.002
I4: Others	5.199	4	0.002
Panel 2: The mechanisms by which accounting information is shared among supply chain partners			
M1: Building an integrated information system is necessary to satisfy the information needs at the supply chain level.	3.918	4	0.156
M2: Accounting data can be shared via and only via formal condoms such as integrated information systems or OBA.	2.132	4	0.120
M3: Informal relationships could facilitate accounting data sharing.	2.204	4	0.107
Panel 3: The hurdles of accounting information sharing			
H1: A lack of information systems and cost systems at some points of the supply chain	8.796	4	0.001
H2: Technical deficiencies: The inexistence of facilities to share data	1.487	4	0.059
H3: The notion of mistrust between the chain partners	6.696	4	0.044
H4:A lack of cooperation among supply-chain partners	6.463	4	0.042
H5: Other factors	3.896	4	0.050

OBA, Open-book accounting.

supply chain members is rejected. Therefore, there is variability among respondents working in various production processes of the chain cycle regarding the perceived role of accounting information sharing among supply chain partners.

Consistent with the findings, Utomo, Suhartono and Machmuddah (2020) acknowledge the crucial role of top management in cultivating support, motivation and attention among employees to efficiently utilise accounting information system (AIS), leading to increased productivity and favourable supply chain performance outcomes. Furthermore, in underlining the importance of trust and collaboration among supply-chain partners to enhance supply-chain performance, Panahifar et al. (2018) empirically illustrate that three collaboration facilitators – trust, information readiness and secure information sharing – bolster supply-chain collaboration. Furthermore, echoing Karaosman et al. (2020), the findings underscore the significance of supply chain collaborations in mitigating costs at both the firm and supply chain levels. This reduction stems from the shared cost among the partners within the supply chain (Karaosman et al. 2020).

As illustrated in panel 2 of Table 3, respondents were asked to express their overall perceptions regarding the way in which accounting data are disseminated in the textile chain. According to Table 3, panel 2, almost two-thirds of respondents do not prioritise the necessity for an integrated information system to fulfil information needs at the supply chain level. Furthermore, less than a quarter of respondents emphasise the formal mechanisms of data sharing, such as an integrated information system or OBA. In contrast, nearly three-quarters of respondents believe that informal relationships could facilitate the sharing of accounting data within the textile supply chain.

Table 4, panel 2 signifies that there is no substantial disagreement among the perspectives of focal point employees regarding the mechanisms through which accounting information is shared. The Chi-square values for the themes in panel 2, ranging from 2.132 to 3.918, are lower than the tabulated Chi-square value of 5.059. The significance levels for the three themes (0.156, 0.120 and 0.107) in panel 2 of Table 3, respectively, are higher than the 0.05 confidence level. Consequently, the null hypothesis can be affirmed, suggesting

the absence of variations in employees' perceptions regarding the methods through which accounting information is communicated among supply chain partners. Thus, employees commonly hold the belief that accounting information can be readily exchanged through informal channels, negating the necessity to establish a formal mechanism for sharing such data. In a similar vein, Lissillour and Ruel (2020) emphasise the significance of informal mechanisms, particularly social media, for sharing information among supply chain partners in China. Furthermore, Lissillour and Ruel (2020) underscore the role of cultural dimensions in a context where a preference for informalisation exists.

The interviews reveal the mechanisms by which accounting information is disseminated in the dyadic textile supply chain. Workers within the ginning companies frequently maintain familial and collegial connections, fostering a culture where they casually share sensitive information, including internal costs of ginned cotton and other processing expenses, during routine discussions. Consequently, the association with suppliers or ginning companies does not necessitate any formal data-sharing protocols, as information regarding the raw ginned cotton is readily exchanged.

Within the focal company, the production department possesses immediate access to information about the available types and quantity of cotton inventory. Upon receiving a customer order, the department initiates a production plan to estimate the required inventory quantity and the necessary working hours to fulfil the order by its due date. If the needed cotton is not in stock, the production department collaborates with the material control department to procure the necessary quantity of cotton and other raw materials. In such cases, the production flow follows a backward flashing approach, initiated by customer orders. Information regarding the price and quantity of raw ginned cotton from suppliers is effortlessly shared because many employees maintain relational social ties at various levels.

Alternatively, the company may engage in production without specific purchase orders to anticipate future demand. For instance, recognising October as the peak period for brocaded bedding sheets because of an increase in marriage rates, the company may proactively manufacture and store these sheets to meet the anticipated surge in demand. Consequently, the company may produce for inventory purposes rather than solely to fulfil the existing customer orders.

As seen in Panel 3 of Table 3, respondents expressed concerns about obstacles to accounting data sharing and a substantial majority (80%) believed that diverse cost accounting systems among chain partners hinder OBA implementation.

In addition, a significant majority (82.8%) identified the lack of a well-designed infrastructure for data generation and transfer as a major obstacle. Relational factors, including mistrust, were acknowledged by 74.3% as hindrances to effective OBA application. Over three-quarters found obstacles in sharing accounting information formally, citing high costs associated with building firm-level accounting systems and even higher costs for integrated systems at the supply chain level. These challenges involve additional costs for coordination and implementation.

The outcomes of the Kruskal–Wallis test, presented in panel 3 of Table 4, indicate no significant differences among respondents from different production processes concerning the impediments to the applicability of OBA, with the exception of H2, which pertains to the absence of facilities for sharing data. Except for H2, the Chi-square values for the themes in panel 3 of Table 4, ranging from 3.896 to 8.796, exceed the tabulated Chi-square value of 2.059 at a 0.05 confidence interval and 4 DF.

Consequently, the null hypothesis can be rejected at a significance level of 0.05, except for H2. The results strongly suggest that employees hold varying perceptions regarding the obstacles to accounting information sharing among supply chain partners, with the exception of H2. The Chi-square value for H2 is 1.487, which is lower than the tabulated Chi-square value of 2.059. The observed significance level for H2 is 0.059, higher than the 0.05 confidence level, implying no differences among employees in their perception of the lack of necessary infrastructure as a barrier to sharing accounting data. Yuhua et al. (2023) highlight the results by underlining the significance of infrastructure and platforms for sharing accounting data among supply chain partners. They emphasise the role of cloud accounting in providing users with extensive services by leveraging resources, services and applications as public facilities, aiming to achieve the integration of accounting information resources.

Despite the mentioned challenges, accountants themselves assert that obtaining the necessary data to assess ginned cotton prices is a straightforward process. Employees at the ginning companies often have familial and collegial relationships, leading them to freely exchange confidential data related to the internal cost of ginned cotton and other processing expenses as part of their everyday discussions. An excerpt from an interview with an accountant at the focal manufacturing company illustrates this point:

> I can easily determine whether the ginned cotton prices are reasonable or not. I don't require any formal arrangements. Instead, my colleagues at the ginning company inform me about these prices during our casual conversations at the club without any extra effort on my part. They don't consider it as sharing confidential information because I already have many relatives who are farmers that regularly inform me about raw cotton prices.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Tanta University, Faculty of Commerce (reference no. N/A).

Results

The results underscore the significance of accounting information sharing in enhancing supply chain dynamics and

fostering cooperation. The survey's findings highlight the positive perceptions regarding the benefits of sharing accounting information and the preference for informal channels. Interviews reveal the practical mechanisms through which accounting data are exchanged, emphasising the role of informal relationships. However, challenges such as diverse cost accounting systems and infrastructure limitations pose barriers to formal information-sharing mechanisms. Despite these challenges, employees demonstrate resourcefulness in obtaining necessary data and leveraging informal networks and relationships.

Drawing from institutional theory, particularly insights from Helmke and Levitsky (2004), the findings highlight the significance of both formal and informal organisational structures in shaping management control processes. In less developed countries, informal institutions wield considerable influence. Despite prevalent challenges to accounting data sharing, such as varied cost accounting systems, infrastructure limitations and relational factors such as mistrust, these obstacles do not appear to hinder accountants' ability to access data for evaluating ginned cotton prices. The efficacy of informal channels in surmounting perceived barriers is evident in the interview excerpt. Several factors contribute to restricted sharing, including a lack of robust trust among supply-chain partners, apprehensions about data leakage to competitors and concerns that partners may exploit shared data to negotiate lower prices. The company adopts a cautious approach, maintaining confidentiality regarding cost data and profit margins, divulging them only in specific instances.

Overall, the findings emphasise the need for a balanced approach to accounting information sharing, considering both formal mechanisms and leveraging existing informal networks. Addressing infrastructure limitations and building trust among supply chain partners are critical steps towards enhancing information exchange and collaboration.

Conclusion

The contextual significance plays a pivotal role in shaping management accounting practices. In less developed countries, where informal institutions are widespread, the dynamics of management accounting control processes differ significantly from those in developed and stable contexts. The research delves into the intricate landscape of the Egyptian textile supply chain, focusing on the significance, methods and challenges associated with accounting information sharing in developing countries.

The findings unveil critical insights into the perceptions and practices surrounding accounting information sharing within the textile supply chain. Respondents overwhelmingly recognise the positive impact of enhanced accounting information exchange on various aspects of supply chain management. Notably, the emphasis on improved product quality, timely delivery, efficient ordering, increased customer awareness, and the cultivation of trust and cooperation resonates throughout the responses. However, variations in the perceived importance of accounting information sharing emerge among respondents engaged in different production processes. Despite this diversity, a consensus prevails when examining employees' perceptions of communication methods. Informal channels are favoured over formal mechanisms, reflecting a shared belief that a formal system is deemed unnecessary.

The existence of long-term relationships within the Egyptian textile supply chain does not necessarily translate into a collective vision for the entire chain. Individual chain members prioritise their own circumstances, resorting to informal mechanisms such as backdoor access to accounting information. While formal practices of accounting information sharing are not explicitly observed, underdeveloped forms exist, primarily involving one-way sharing of technical information from customers to the company.

Interview insights shed light on the informal nature of accounting information sharing within the dyadic textile supply chain. Familial and collegial connections within ginning companies foster a culture where sensitive information is casually exchanged during routine discussions, negating the need for formal data-sharing protocols. Similarly, within the focal company, relational ties facilitate the effortless exchange of information about raw materials, production plans and customer orders.

Challenges to accounting data sharing, including diverse cost accounting systems, infrastructure limitations and relational factors such as mistrust, are acknowledged. However, these challenges do not seem to impede the ease with which accountants access data to assess ginned cotton prices. The effectiveness of informal channels in overcoming perceived obstacles is underscored in the interview excerpt. Several factors contribute to limited sharing, including a lack of robust trust among supply-chain partners, concerns about data leakage to competitors and fears of partners exploiting shared data to negotiate lower prices. The company adopts a conservative approach, keeping cost data and profit margins confidential, revealing them only in specific cases.

In essence, the discoveries not only illuminate the intricate details and subtleties of accounting information sharing within the textile supply chain but also underscore the robustness of informal communication channels in overcoming obstacles. As the industry grapples with these dynamics, acknowledging the significance of relational bonds and informal exchanges may play a crucial role in cultivating a more streamlined and cooperative supply chain ecosystem.

The research enhances theoretical understandings by elucidating the contextual significance of management accounting practices, particularly in less developed countries with prevalent informal institutions. We shed light on the

role of informal communication channels and their impact on management control processes within the textile supply chain. Additionally, we highlight variations in the perceived importance of accounting information sharing among respondents involved in different production processes, offering insights into supply chain management practices. Furthermore, the study investigates the impact of long-term relationships within the textile supply chain on collective vision and information-sharing practices, contributing to the theoretical discourse on inter-organisational dynamics.

The findings also offer practical insights for improving supply chain management and accounting practices in the textile industry. We highlight the positive effects of enhanced accounting information exchange on various aspects such as product quality, delivery efficiency, ordering processes, customer awareness and trust-building. Recognising the preference for informal channels over formal mechanisms in accounting information sharing suggests opportunities for refining communication within supply chains. Addressing challenges such as diverse cost accounting systems, infrastructure limitations, mistrust and data security concerns can guide strategies for enhancing collaboration and efficiency in the textile supply chain ecosystem. Emphasising relational bonds and informal exchanges to overcome obstacles underscores the significance of nurturing cooperative relationships for effective supply chain management.

The limitations of the article pave the way for future research avenues. Initially, the focus is on information sharing within dyadic interorganisational relationships. However, in a network setting, accounting information sharing might yield contradictory outcomes. Despite the assumption of positive results, existing literature indicates complexities arising from relationship interdependence and numerous participants, leading to negative implications such as sharing manipulated data or leaking confidential information, which may be more pronounced in networking. Consequently, future research could explore the concept of accounting information sharing within a broader network setting.

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Competing interests

The authors have declared that no competing interest exists.

Authors' contributions

L.M.A.A. and R.A.A contributed to review and editing of the article. L.M.A.A. contributed to conceptualization, methodology, formal analysis, data curation, and writing of the article. All authors have read and agreed to the published version of the manuscript.

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Data availability

The data that support the findings of this study are not available because of privacy issues.

Disclaimer

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