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ORIGINAL RESEARCH

Audit quality and the market value of cash: the role played by the Big 4 auditor in Latin America

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Abstract
Despite the extensive discussion in the accounting literature regarding the importance of internal control for the proper allocation of corporate resources, little is known about the role of auditors as a governance mechanism in reducing agency costs related to cash resources. This study extends the literature that explores differences in audit quality by examining whether perceived audit quality, measured by the Big 4/non-Big 4 dichotomy, mitigates the value destruction associated with cash. To the extent that investors do not perceive Big 4 auditors, as opposed to non-Big 4 auditors, as effective in preventing the potential value destruction associated with cash holdings or enhancing the contribution of cash to firm value in Latin America, our article is the first to document that investors do not assign a statistically significant premium to the cash balances of Big 4 clients. The results hold after a series of robustness checks and additional analyses. Our article enriches the literature on audit quality, corporate governance and cash holdings by demonstrating no statistically significant influence of auditor choice on the value investors place on cash reserves in a weak legal environment, i.e., where minority shareholders are poorly protected. Our conclusions have important implications for investors and lenders looking to Latin America to diversify their investments, as our findings about audit quality can influence their investment decisions. This study also has practical implications for the debate concerning the role played by audit quality.

Keywords Auditor choice · Auditor size · Cash value · Corporate governance · Emerging markets

JEL Classification G32 · G34 · M42

1 Introduction

In this paper, we examine whether the value shareholders place on a dollar of cash is influenced by auditor choice, i.e., between Big 4 and non-Big 4 auditors in the Latin American setting. Investors need information that accurately reflects the reality of a company, and financial statements are usually the principal means of communication

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between the company and external shareholders (Khurana and Raman 2004). Ensuring that the information disclosed is a fair representation of reality improves resource allocation and efficiency in stakeholder decision-making (Defond and Zhang 2014). An independent, high-quality audit is an important institutional practice that increases the credibility of financial reports (Francis 2004; Defond and Zhang 2014). In this respect, the literature indicates that audit quality is a relevant governance mechanism (Jensen and Meckling 1976; Defond and Francis 2005).

Audit quality, encompassing auditors' tasks and opinions, is of significant importance to investors, regulators, and society at large (Francis 2004; Myers et al. 2014). The auditing profession has faced intense public and regulatory scrutiny since the early 2000s, especially following high-profile corporate failures such as Enron, Tyco International, and WorldCom (Myers et al. 2014). However, despite extensive research on the impact of various corporate governance mechanisms on the market value of cash (e.g., Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Frésard and Salva 2010; Louis et al. 2012; Manoel et al. 2023), there is fairly sparse evidence on whether the value shareholders place on a dollar of cash is influenced by auditor choice, i.e., between Big 4 and non-Big 4 auditors.

Finally, although some studies have examined whether the four largest international accounting firms (the Big 4 auditors[1]) provide higher audit quality (or are perceived to conduct audits of higher quality) relative to non-Big 4 auditors, the Big 4 effect remains controversial (Lawrence et al. 2011; Defond et al. 2017; Jiang et al. 2019; Aobdia et al. 2021; Francis 2023). Moreover, the existing literature largely focuses on the North American context, leaving a significant gap in understanding audit quality in other regions. In light of these arguments, Lawrence et al. (2011), DeFond et al. (2017), and Jiang et al. (2019) highlight the need for more research on the Big 4 effect, especially in emerging economies. In this paper, we aim to fill this gap in the empirical literature by examining the role of high-quality auditors as a governance mechanism in mitigating the agency problems associated with cash holdings in the Latin American context.

We focus on cash holdings in this research for three reasons. First, cash represents a significant portion of firms' total assets, and the literature documents an increase in cash levels over the past twenty years. This rise in cash levels has, in turn, attracted the attention of academics, policymakers, and the popular press (Bates et al. 2018; Chowdhury et al. 2021; Manoel and Moraes 2022b; Anderson et al. 2024; Darmouni and Mota 2024; Khokhar et al. 2024). Second, while cash reserves provide operational flexibility, they can also have a dark side (Opler et al. 1999; Dittmar and Mahrt-Smith 2007; Iskandar-Datta and Jia 2014; King et al. 2025). Specifically, cash is the most vulnerable asset to agents' opportunistic behavior because it is less costly for unscrupulous managers to consume the private benefits attached to cash compared to other assets (Myers and Rajan 1998; Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007). A lack of robust internal control systems allows entrenched managers to spend cash holdings on value-destroying investments that benefit themselves but not shareholders. Given that improper cash diversion can devastate shareholder welfare (Dittmar and Mahrt-Smith 2007; Manoel and Moraes 2022a), it is important to understand the role of high-quality auditors in mitigating agency problems associated with free cash flow. Finally, the value investors attach to an incremental dollar of cash allows us to estimate the extent of managerial extraction of private benefits embedded in cash resources (Huang and Zhang 2012; Huang et al. 2019).

[1] The Big 4 auditors are Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers. For convenience, we use the term Big 4 throughout this article as generic, encompassing the Big 8, Big 6, Big 5, and Big 4 eras.

The extant literature provides evidence that Big 4 audits are associated with improved financial reporting and more reliable financial statements compared to non-Big 4 audits, which can reduce information asymmetry and agency costs (Francis 2004; Fan and Wong 2005; Defond and Zhang 2014). Additionally, Big 4 auditors are often perceived in the U.S. as providing higher quality audits that facilitate external discipline, thus preventing the potential misuse of cash and the associated destruction of cash value (Huang et al. 2019). In light of these arguments, Huang et al. (2019) hypothesize and find that Big 4 clients receive a higher valuation on a dollar of cash relative to those audited by non-Big 4 auditors. Although the evidence provided by Huang et al. (2019) suggests a valuation premium for the cash holdings of Big 4 clients in the U.S. setting, their conclusions may not be generalizable to other contexts, particularly within less developed capital markets characterized by civil law attributes and low auditor litigation exposure.

Latin America presents a distinctive setting to examine whether audit quality influences investors' perception of the contribution of cash holdings to firm value, i.e., the market value of cash. First, despite the relevance of Latin America in the world economy, this region has been largely neglected by the audit quality and cash management literature. Given the scarce evidence on this pertinent issue, there are ample opportunities for more research (Manoel et al. 2025; Moraes et al. 2025). Second, audits are relatively inexpensive compared to the harmful effects of auditors' inability to detect or report corporate scandals, which have economic and social consequences for both firms and society. Third, international investors are increasingly looking to emerging markets to diversify their investments (Michas 2011). The growing relevance of emerging economies in the global business environment, coupled with recent corruption scandals in Latin America (e.g., the cases of Odebrecht and Petrobras, both audited by Big 4 firms), underscores the need for additional research on the role of audit quality in corporate governance beyond the context of the United States.

Fourth, and perhaps most importantly, the Latin American context is highly suitable for this study due to the region's relative uniformity. The countries within this region exhibit considerable similarities in their historical backgrounds, economic and political evolution, geographical traits, and socio-cultural features, which are less analogous compared, for example, to those of European nations (Cuervo-Cazurra 2016; Aguinis et al. 2020; Manoel et al. 2025; Moraes et al. 2025). This homogeneity enhances cross-country comparability, effectively controlling for various confounding factors, particularly those related to the institutional environment that might affect how investors value cash resources (Cuervo-Cazurra 2016; Aguinis et al. 2020). Consequently, by focusing on this context, we can more accurately assess the impact of auditor choice on the market value of cash while mitigating the potential confounding effects of differing governance standards, regulatory frameworks, and levels of investor protection.

Moreover, there are relevant differences in the Latin American setting compared to the North American one, which can have relevant implications for auditor incentives and the role of audit quality in corporate governance. On the one hand, the U.S. has a high litigation risk environment, i.e., the U.S. legal regime (Common Law tradition) provides a strong incentive for good auditing (Francis 2004; Khurana and Raman 2004). On the other hand, Latin America is a region with historically low levels of investor protection and a Civil Law tradition with a very slow legal system due mainly to the high number of lawsuits and a very limited number of judges and clerks (Chong and Lopez-de-Silanes 2007). Choi and Wong (2007) and Choi et al. (2008) suggest that audit quality may be compromised in environments where the legal framework fails to adequately

support and discipline auditors. In such contexts, auditors may prioritize client requests over audit integrity, as the benefits of compliance often outweigh the potential penalties.

Additionally, there are considerable differences in the audit profession in Latin America. For instance, audit firms in Latin America frequently offer non-audit services to their clients, a practice prohibited in the U.S. by the Sarbanes–Oxley Act of 2002 due to concerns about conflicts of interest compromising the transparency of financial reporting (DeFond and Francis 2005). Considering the significant influence of legal systems and regulatory environments on auditor incentives, DeFond and Francis (2005) highlight the need for more studies outside the U.S. to understand better how changing institutional environments affect auditor behavior and incentives. Ultimately, the empirical examination of a Big 4 effect on the market value of cash—specifically, whether investors perceive Big 4 auditors as mitigating potential value destruction associated with holding cash and/or enhancing the contribution of corporate cash holdings to firm value—remains an unresolved empirical question that necessitates further investigation. Our paper aims to address this gap and contribute to the discussion on emerging markets by examining the role of audit quality in the valuation of cash held by Latin American firms. To measure perceived audit quality, we use the Big 4/non-Big 4 dichotomy.

Using the valuation model of Pinkowitz et al. (2006), we find robust panel data evidence that investors do not pay a statistically significant valuation premium on a dollar of cash in firms audited by a Big 4 relative to those audited by a non-Big 4. We obtain similar results when we use the alternative market value of cash framework of Faulkender and Wang (2006). Further analyses also reveal that the market value of excess cash of Big 4 clients does not differ significantly from that of non-Big 4 clients. In sum, we do not find significant evidence of a valuation premium on the cash of Big 4 clients relative to the cash of non-Big 4 clients in the Latin American setting.

Our main results are robust to a series of robustness checks, including addressing possible endogeneity problems related to auditor choice and controlling for the effect of other governance mechanisms and financial reporting quality. To address the self-selection bias resulting from the non-random sample of firms deciding to hire a Big 4 auditor, we employ Heckman's (1979) two-stage procedure with corrected standard errors to improve the estimates obtained from non-random samples. To be more careful and rigorous in addressing the self-selection bias concern, we also use propensity score matching (PSM) as a statistical matching technique to explicitly isolate the influences of auditor type from those of client characteristics. Even after applying the Heckman (1979) and PSM procedures, we fail to find a positive and significant association between audit quality and cash value. Further analysis also reveals that the market value of cash does not increase when clients switch their auditors from a non-Big 4 to a Big 4. This additional test indicates that our empirical results are unlikely to be driven by potential endogeneity concerns related to a firm's auditor choice. Lastly, our main findings hold even after using audit fees as an alternative way to infer audit quality.

This study offers relevant contributions to the literature. First, in the spirit of Kim et al. (2015) and Huang et al. (2019), our paper contributes to the literature on audit quality, corporate governance and cash holdings, offering a better understanding of the role of Big 4 auditors vis-à-vis their non-Big 4 rivals in constraining the reduction in firm value arising from managerial expropriation of cash reserves. Second, this manuscript addresses DeFond and Francis' (2005) call for further investigation into auditor selection practices beyond the United States. By extending the predominantly U.S.-centric literature on this topic, this research provides new insights into the relationship between auditor choice and shareholders' perceptions of the contribution of cash balances to firm value.

Third, our article also enriches the literature by demonstrating no significant influence of auditor choice on the value investors place on cash in a setting with a low incentive for auditors to provide high-quality audits. Therefore, while Huang et al. (2019) document that Big 4 accounting companies tend to outperform their non-Big 4 rivals in combating the private benefits associated with cash holdings in the U.S. setting, we do not find a positive and statistically significant association between audit quality and cash value. Fourth, we also contribute to existing studies by identifying a greater discount for cash assets in emerging economies.

Our empirical results may also have important implications for policymakers and regulators in Latin America as they seek to understand the role of audit quality in enhancing corporate transparency and investor confidence, particularly in the wake of recent high-profile corporate scandals in the region. Finally, our findings have important implications for investors and lenders looking to Latin America to diversify their investments, as our inferences about perceived audit quality can influence their investment decisions.

The remainder of the paper proceeds as follows. In Sect. 2, we review prior literature to support the research hypothesis. In Sect. 3, we describe our sample and explain the cash valuation model used in the study. Section 4 presents our main results, including a series of robustness checks and additional analyses. Finally, Sect. 5 concludes the paper.

2 Literature review and hypothesis development

Keeping part of total assets in the form of cash and cash equivalents provides benefits to companies in imperfect capital markets. Among these benefits, the literature mentions, for example, the financing of day-to-day operations (Keynes 1936; Opler et al. 1999), avoiding transactional costs associated with external financing (Bates et al. 2009), taking advantage of positive net present value (NPV) projects when they arise (Keynes 1936; Opler et al. 1999), reducing the problems associated with imperfections in capital markets (Faulkender and Wang 2006), serving as a buffer against adverse cash flow shocks, and meeting unexpected contingencies (Keynes 1936; Bates et al. 2009).

Nonetheless, cash balances also have a dark side. First, investment in cash is costly because, by accumulating cash, companies forego investments in more profitable assets (Opler et al. 1999; Bates et al. 2009). Moreover, cash also exposes firms to managerial opportunism since cash can be converted into private benefits at a lower cost relative to less liquid assets (Myers and Rajan 1998). Accordingly, recognizing the dual nature of cash as a potential double-edged sword (Myers and Rajan 1998; Opler et al. 1999), investors should assess the value of corporate cash holdings by considering their role in preventing underinvestment issues and determining whether cash facilitates overinvestment in projects with negative NPV (Pinkowitz et al. 2006; Kalcheva and Lins 2007).

The term market value of cash is used to describe the contribution of corporate cash holdings to firm value (Faulkender and Wang 2006; Pinkowitz et al. 2006). In imperfect capital markets, the market value of cash should be exactly $1.00, where the cost of obtaining and keeping cash equals its expected benefit. However, the existence of capital market imperfections, such as information asymmetry and agency costs, cause significant differences in the value investors assign to cash holdings (Huang and Zhang 2012; Bates et al. 2018). Furthermore, shareholders recognize the risk of cash expropriation in firms with weak governance mechanisms. Consequently, they penalize cash value in companies where private benefits constitute a substantial part of firm value. Conversely, when governance

mechanisms protect the interests of shareholders, investors place a higher value on each additional dollar of cash (Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Louis et al. 2012; Manoel et al. 2023).

The value destruction associated with corporate cash holdings can be detrimental to shareholders if governance mechanisms fail to align the interests of agents with those of the principals (Jensen and Meckling 1976; Jensen 1986; Myers and Rajan 1998). However, governance mechanisms can enhance the use and value of cash holdings by improving operational returns and limiting self-serving behavior (Dittmar and Mahrt-Smith 2007). Overall, the literature suggests that corporate governance serves as a tool for mitigating the agency costs of free cash flow, with shareholders placing a higher value on a dollar of cash in well-governed companies (Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Frésard and Salva 2010; Manoel et al. 2023; Liu et al. 2024).

External auditing is a crucial monitoring activity among governance mechanisms that can enhance a company's value (Jensen and Meckling 1976; DeFond and Francis 2005). Audits can discipline company activities by reducing agency problems and strengthening risk management and internal controls (Becker et al. 1998). Previous research also suggests that external audits help control agency costs associated with current investment projects (Kim et al. 2015). The effectiveness of an audit lies in reducing the costs associated with opportunistic behavior (DeFond and Zhang 2014).

The literature defines audit quality in terms of the level of assurance as the probability that audited financial statements contain no material omissions or misstatements. The auditor's role, however, is not only to ensure that the financial statements are presented in accordance with current standards, principles, and legislation but also for how well the financial statements reflect the firm's economic reality. Audit quality, however, is not directly observable by users. The main observable outcome of an external audit is the standardized audit report. As a result, stakeholders infer the audit's quality based on the auditor's reputation. The Big N auditors[2] are recognized worldwide by providing higher-audit quality to maintain their brand-name reputation (Francis 2004; Defond and Zhang 2014; Defond et al. 2017).

Existing literature (e.g., Defond and Zhang 2014) provides empirical evidence that financial statements audited by a Big 4 firm are more credible. This increased credibility stems from the independent assurance these auditors provide, ensuring that the accounting information in the audited financial statements is reliable, accurate, and truthful. Big 4 auditors are also more competent because they invest more in human capital and technologies (Jiang et al. 2019). Moreover, high-quality audits help reduce information asymmetry between insiders and outsiders, mitigating adverse selection and moral hazard problems (Francis 2004). Consequently, shareholders can better monitor managers' activities in companies audited by the Big 4 auditor (Francis 2004; Fan and Wong 2005). Finally, the auditing literature documents that high-quality auditors can better detect questionable accounting practices and can object to qualifying the audit report in cases of irregularities (Becker et al. 1998).

As stated earlier, investors tend to discount the market value of cash in poorly governed firms, as they do not expect to receive the full benefits of cash holdings (Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Frésard and Salva 2010; Huang and Zhang 2012; Louis et al. 2012; Chowdhury et al. 2021; Manoel et al. 2023; Liu et al. 2024). Additionally, Drobetz et al. (2010) point out that shareholders assign a lower value to cash

[2] The literature addresses Big 8, Big 6, Big 5, and currently Big 4 chronologically, after the mergers and even the most recent corporate failings involving Arthur Andersen.

in firms with higher information asymmetry. Thus, by hiring a Big 4 auditor, a company signals to investors that financial statements are of high quality, reducing monitoring costs and limiting self-interested managers' ability to extract private benefits of control (Michas 2011; Huang et al. 2019).

Based on this line of reasoning, Huang et al. (2019) hypothesize that firms audited by a Big 4 firm receive a higher valuation per dollar of cash compared to those audited by non-Big 4 firms. To test this hypothesis, they examined a sample of U.S. public companies from 1991 to 2010. Consistent with their research hypothesis, they find empirical evidence that investors apply a discount to the market value of cash in firms audited by non-Big 4 firms ($0.88) compared to those audited by Big 4 firms ($1.09). According to Huang et al. (2019), the role of higher perceived audit quality in mitigating the value destruction associated with corporate cash holdings is based on the assumption that Big 4 auditors are more likely to detect unauthorized transactions and reveal abnormal related-party activities (e.g., asset acquisitions, intercorporate loans) to external shareholders.

Put differently, their findings suggest that high-quality audits facilitate both internal and external monitoring of managerial cash expenditures, thereby alleviating the value destruction linked to corporate cash holdings. This, in turn, enhances the contribution of corporate cash holdings to firm value. In summary, in accordance with Huang et al. (2019), the superior capacity of Big 4 auditors to address the principal-agent problem, reduce information asymmetries, and enhance investment efficiency by inducing efficient use of cash reserves among their clients implies that external investors attribute a heightened value to the cash holdings of companies audited by the Big 4 (Huang et al. 2019).

Moreover, high-quality financial reporting allows investors to monitor substantial cash expenditures more effectively (Kim et al. 2015). Louis et al. (2012) support this assertion by providing empirical evidence that the market value of each additional dollar of cash is enhanced through accounting conservatism, indicating that cash resources are managed more efficiently in enterprises with conservative financial reporting policies. Additionally, Huang and Zhang (2012) demonstrate that investors place a higher value on the cash assets of companies with superior disclosure quality.[3] Consequently, the economic impact of cash balances is anticipated to improve substantially with the enhanced monitoring quality provided by a Big 4 auditor (Huang et al. 2019).

However, the findings of Huang et al. (2019), which suggest a higher valuation of cash holdings among Big 4 clients in the U.S., may not be directly applicable to Latin America due to significant institutional distinctions between the regions. One fundamental difference between the U.S. and Latin American settings lies in the legal environment. For instance, external investors in the United States generally benefit from robust legal protections inherent in a Common Law system. Conversely, Latin American countries operate under a Civil Law system predominantly influenced by the French legal tradition and are characterized by underdeveloped markets, weak legal protections for minority shareholders, and a lower risk of auditor litigation (Chong and Lopez-de-Silanes 2007; Manoel and Moraes 2022b; Manoel et al. 2025; Moraes et al. 2025). This distinction in the legal environment may have significant implications for the role of auditors as a corporate governance mechanism and the market's perception of audit quality (Fan and Wong 2005; Choi and Wong 2007; Choi et al. 2008).

[3] High-quality audits enhance the quality of financial reporting. This improvement in financial reporting, in turn, strengthens external oversight by financial statement users, thereby reducing managerial misappropriation of cash resources (Huang et al. 2019).

In this respect, Fan and Wong (2005), Choi and Wong (2007), and Choi et al. (2008) document that in weak legal environments, auditors may fail to serve the role of a substitute governance mechanism in mitigating agency costs and to reduce information asymmetry between internal and external stakeholders. This occurs because audit quality may be compromised in environments where the underlying institutions, such as the legal system, are not in place to support and discipline auditors. After all, the benefits of consenting to clients' requests outweigh the potential penalties. In other words, in a weak legal environment, auditor choice can become irrelevant because the weak public enforcement fails to punish violations identified by auditors (Fan and Wong 2005; Choi and Wong 2007; Choi et al. 2008). Consistent with the preceding arguments, Fan and Wong (2005) provide empirical evidence that higher-quality accounting and auditing occur mainly in countries with stronger investor protection.

Another significant distinction between the regulatory environments of the United States and Latin America pertains to the governance of audit firms' provision of non-audit services. In the United States, the Sarbanes–Oxley Act of 2002 prohibits audit firms from offering non-audit services to their audit clients. This legislation was enacted to mitigate conflicts of interest that could potentially compromise the transparency and reliability of financial reporting (DeFond and Francis 2005). Conversely, in Latin America, audit firms are permitted to provide both audit and non-audit services to their clients. This practice raises concerns about auditor independence and the overall quality of audits conducted by both Big 4 and non-Big 4 firms in the region.

To illustrate the potential implications of this practice, Francis (2023) references Deloitte's 2021 global revenues, which totaled $50.2 billion from offices in over 150 countries. Of this, $10.5 billion was from audit and assurance services, $8.9 billion from taxation services, and $31.8 billion from other services, including risk advisory, financial advisory, and various consulting services. This example indicates that approximately 63.5% of Deloitte's revenue originates from non-audit services. These figures suggest that the Big 4 accounting firms function as comprehensive professional service firms with a predominant focus on consultancy practices.

Regulators are concerned that the significant emphasis on expanding consulting services may lead to the neglect of audit and assurance practices. This shift in focus could discourage professional staff and audit partners, ultimately undermining audit quality. The heavy reliance on lucrative consulting engagements challenges the firms' capacity to deliver high-quality audit services and maintain the standards expected in the auditing profession (Francis 2023). Collectively, the divergence in regulatory practices highlights potential risks in the Latin American context, where the integration of audit and non-audit services by the same audit firm raises a concern that the monitoring role of auditors may be in conflict, for example, with its consultancy activities with client companies.

Additionally, it is important to acknowledge that corporate failings involving the Big N auditors over the past two decades have raised doubts about whether they offer superior audit quality compared to non-Big N firms (Chaney et al. 2004). Notably, Big 4 audit firms failed to detect significant accounting scandals in Latin America, such as those involving the Brazilian subsidiaries of the French retail giant Carrefour and Banco PanAmericano. Furthermore, the corruption scandal involving the Brazilian oil giant Petrobras and a consortium of construction companies, including Odebrecht—all audited by Big 4 firms—warrants attention. These corporate collapses could have repercussions for the global reputation of Big N auditors, influencing investors' perceptions of audit quality in general and of the Big N audit firms in particular.

Overall, the arguments comparing the Latin American setting to the North American context suggest that the effectiveness of audit quality as a corporate governance mechanism in mitigating agency costs associated with cash holdings in Latin America is both controversial and an empirical question. If investors do not perceive Big 4 auditors as effective in preventing potential value destruction associated with holding cash or in increasing the contribution of corporate cash holdings to firm value, we hypothesize that they do not place a significant valuation premium on the cash holdings of Big 4 clients relative to the same dollar of cash held by non-Big 4 clients. Based on the above arguments, we propose the following hypothesis in the null form:

Ceteris paribus, a dollar of cash is not significantly more valuable for shareholders in companies audited by a Big 4 auditor than for those audited by a non-Big 4 audit firm in Latin America.

3 Research methodology

3.1 The sample

We use in this paper data from the six largest Latin American economies (Argentina, Brazil, Chile, Colombia, Mexico, and Peru), for which we were able to construct a significant dataset with all the information needed for the study over the sample period of 2003–2018.[4] The sample starts in the fiscal year 2003 because this was the first year of the Big 4 era. For comparative purposes, all financial statement data is reported in thousands of U.S. dollars. Our sample includes surviving and non-surviving companies with data available from the Thomson Reuters database at any time in the sample period. Following the existing literature (e.g., Opler et al. 1999; Dittmar and Mahrt-Smith 2007; Bates et al. 2009; Anderson et al. 2024; Darmouni and Mota 2024; Khokhar et al. 2024), we exclude financial and utility firms from the sample due to the influence of statutory capital requirements and other government regulations on their cash policies. After implementing these filters, our final sample consists of an unbalanced panel dataset comprising 452 Latin American public firms (3,253 firm-year observations) for which the necessary annual data are available.

3.2 Market value of cash

To estimate the contribution of corporate cash holdings to firm value, we use the valuation regression of Pinkowitz et al. (2006). The dependent variable of their valuation model is the market-to-book ratio as a proxy of firm value. The control variables are those expected to affect shareholders' expectations of future net cash flows, which determine firm value. The determinants of future cash flows are past changes, future changes, current earnings levels, R&D expenses, dividends, interest expenses, and past and future changes in assets and market value. Future changes (dX_{t+1}) are also included in the regression model to absorb changes in expectations.

The model used by Pinkowitz et al. (2006) can be observed in Eq. 1:

[4] Our main results remain unchanged when we extend the sample period back to 2000.

$$V_{i,t} = \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} + \beta_6 RD_{i,t} + \beta_7 dRD_{i,t} + \beta_8 dRD_{i,t+1} + \beta_9 I_{i,t} + \beta_{10} dI_{i,t} + \beta_{11} dI_{i,t+1} + \beta_{12} D_{i,t} + \beta_{13} dD_{i,t} + \beta_{14} dD_{i,t+1} + \beta_{15} dV_{i,t+1} + \beta_{16} dCash_{i,t} + \beta_{17} dCash_{i,t+1} + \varepsilon_{i,t} \quad (1)$$

Where V denotes the market value of the firm (market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt; E is earnings before interest and extraordinary items (after depreciation and taxes); NA is net assets (total assets minus cash and cash equivalents); RD is research and development (R&D) expenses; I is interest expense; D is total dividends paid; $Cash$ is the sum of cash and cash equivalents. All variables are normalized by total assets to make firms' attributes comparable (Pinkowitz et al. 2006). X_t is the level of variable X in year t scaled by total assets in year t; dX_t is the change in the level of X from year $t-1$ to year t scaled by total assets in year t, that is, $((X_t - X_{t-1})/TotalAssets_t)$; dX_{t+1} is the change in the level of X from year $t+1$ to year t scaled by assets in year t, that is, $((X_{t+1} - X_t)/TotalAssets_t)$;

In Eq. 1, the coefficient on the contemporaneous change in cash assets (β_{16}) directly reflects an augmentation of cash that contributes to the enterprise's existing assets (Pinkowitz et al. 2006). This coefficient reflects the magnitude of the potential for value creation or value destruction of an additional dollar of cash perceived by shareholders (Frésard and Salva 2010). According to Pinkowitz et al. (2006), Eq. 1 allows researchers to evaluate the impact of a change in cash balances while keeping the other variables unchanged. In other words, assuming that the impact of a change in cash holdings on future cash flows is measured by the lead variables that capture investors' expectations, then the coefficient on the change in cash assets is an estimate of the market value of cash (Pinkowitz et al. 2006).

As stated earlier, we use the Big 4/non-Big 4 dichotomy to distinguish between high- and low-quality auditors. To assess our research hypothesis, we add the Big 4 dummy variable (coded as 1 if a Big 4 auditor audits a company and 0 otherwise) and its interaction with the change in cash holdings into our valuation framework. The inclusion of the Big 4 dummy variable accounts for the direct impact of perceived audit quality on firm value. Moreover, due to the small number of firms with data available on research and development (R&D) expenditure[5] in the sample, we opt to use the yearly growth rate of a firm's sales as an alternative proxy for growth opportunities (Manoel et al. 2023). We also include GDP growth in our valuation model to control for economic growth. All other variables are as previously defined in Eq. 1. Specifically, we estimate the following valuation regression:

$$V_{i,t} = \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} + \beta_6 GrowthOpportunities_{i,t} + \beta_7 I_{i,t} + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} + \beta_{13} dV_{i,t+1} + \beta_{14} dCash_{i,t} + \beta_{15} BIG4_{i,t} + \beta_{16} dCash_{i,t} * BIG4_{i,t} + \beta_{17} dCash_{i,t+1} + \beta_{18} GDP_{i,t} + \varepsilon_{i,t} \quad (2)$$

The coefficient of interest in Eq. 2 is β_{16} ($dCash_{i,t} * BIG4_{i,t}$), which measures the effect of audit quality on the market value of cash. To the extent that Big 4 and non-Big

[5] Our main conclusions are the same when we consider companies that do not report R&D expenses as those without R&D.

4 auditors exhibit similar monitoring quality, we expect the coefficient on the interaction term ($dCash_{i,t} * BIG4_{i,t}$) to be statistically indistinguishable from zero.

Auditor choice is a corporate decision rather than a random assignment (Chaney et al. 2004; Jiang et al. 2019). Therefore, ordinary least squares (OLS) regressions that ignore self-selection issues will yield biased results (Chaney et al. 2004). To address the problem of endogeneity, we use firm fixed effects in our initial analysis. Additionally, we include year fixed effects in Eq. 2 to account for time trends.

3.3 Descriptive statistics

Table 1 provides an overview of the descriptive statistics of the variables and details on the number of firms included in the sample. In Panel A of Table 1, some descriptive statistics are provided for each Latin American country examined in this paper. Panel B, in turn, furnishes summary statistics for the complete sample within the framework of our primary valuation model described in Eq. 2. Throughout the study, we winsorize all continuous variables at the 1st and 99th percentiles to mitigate the influence of extreme values. It is relevant to mention that our summary statistics are not directly comparable to descriptive statistics in most other articles in the literature.

In Panel A of Table 1, we present the composition of our full sample of Latin American firms, comprising 3,253 firm-year observations. Within this dataset, 72.39% of the firms are identified as Big 4 clients. Notably, this proportion is comparatively lower than what is typically observed in samples of U.S. public firms, where over 90% of the clients engage Big 4 auditors (Francis 2004). Consequently, our sample comprises 72.39% of firms audited by a Big 4, distinguishing it from the higher prevalence found in U.S. public firms.

Within our sample, Chile stands out with the highest percentage of Big 4 auditors at 92.32%, followed by Brazil (77.46%), Colombia (70.80%), Mexico (69.34%), Argentina (66.89%), and Peru (50.97%). The significant variation in the percentages of companies opting for Big 4 auditors across the Latin American countries examined in this study can be attributed to several key factors. Firstly, differences in regulatory environments and regional audit market structures may play a crucial role. For example, countries like Chile and Brazil may have more stringent listing requirements or regulations that drive higher demand for Big 4 auditors among publicly traded firms. Conversely, countries like Peru may feature a more diverse audit market with a stronger presence of non-Big 4 firms, providing viable alternatives for companies.

Secondly, the level of investor protection and the strength of corporate governance structures across Latin American countries can also contribute to variations in Big 4 market share. In countries with stronger investor protection and more developed governance practices, such as Chile and Brazil, companies may be incentivized to signal quality and credibility by hiring Big 4 auditors. The rigorous corporate governance norms in these countries create an environment where the perceived credibility of Big 4 auditors is highly valued. Conversely, in countries with weaker investor protection, the perceived value-added of Big 4 auditors may be lower, leading to greater reliance on non-Big 4 firms. This may be due to cost considerations or a lesser perceived necessity for the higher assurance that Big 4 firms are believed to provide.

Thirdly, cultural and economic factors also play a significant role. In some countries, historical preferences or trust in local audit firms due to long-standing business relationships and local expertise may influence auditor choice. Additionally, economic constraints in certain countries might make the higher fees charged by Big 4 auditors less

Table 1 Descriptive Statistics

Country	Observations (*N*)	Big 4	Cash/total assets	Market-to-book	Total debt	Growth opportunities	Size	Revenue	GDP
Panel A									
Argentina	447	0.668	0.094	1.054	0.216	0.113	18.902	18.978	3.403
Brazil	874	0.774	0.135	1.113	0.329	0.028	20.547	20.265	0.922
Chile	495	0.923	0.078	0.884	0.252	0.058	20.243	19.766	3.024
Colombia	113	0.707	0.065	0.909	0.171	0.086	20.337	19.715	3.500
Mexico	910	0.693	0.092	1.166	0.253	0.067	20.838	20.487	2.365
Peru	414	0.509	0.057	0.796	0.228	0.076	19.788	19.234	4.670
Full Sample	3,253	0.724	0.096	1.088	0.262	0.063	20.252	19.924	2.553

Variables	Mean	1st Quartile	Median	3rd Quartile	SD
Panel B					
Cash/Total Assets	0.096	0.031	0.069	0.130	0.090
Big 4	0.724	0.000	1.000	1.000	0.447
Market-to-book	1.088	0.557	0.820	1.244	1.654
$E_{i,t}$	0.027	0.004	0.036	0.072	0.137
$dE_{i,t}$	0.002	–0.020	0.001	0.023	0.155
$dE_{i,t+1}$	0.006	–0.020	0.001	0.024	0.125
$dNa_{i,t}$	0.008	–0.073	0.026	0.117	0.254
$dNa_{i,t+1}$	0.057	–0.072	0.017	0.121	0.324
$GrowthOpportunities_{i,t}$	0.063	–0.078	0.046	0.183	0.238
$I_{i,t}$	0.024	0.008	0.016	0.029	0.031
$dI_{i,t}$	0.000	–0.002	0.000	0.004	0.033
$dI_{i,t+1}$	0.000	–0.002	0.000	0.004	0.022
$D_{i,t}$	0.019	0.000	0.005	0.021	0.039
$dD_{i,t}$	0.000	–0.001	0.000	0.003	0.036
$dD_{i,t+1}$	0.001	–0.001	0.000	0.003	0.037

Table 1 (continued)

Variables	Mean	1st Quartile	Median	3rd Quartile	SD
$dV_{i,t+1}$	0.048	–0.141	–0.001	0.187	1.926
$dCash_{i,t}$	0.002	–0.021	0.001	0.025	0.071
$dCash_{i,t+1}$	0.004	–0.023	0.000	0.023	0.082
GDP	2.553	1.322	2.518	4.045	3.167

Table presents the descriptive statistics of our variables and information on the number of firms available in our sample. In Panel A of Table, some descriptive statistics are provided for each Latin American country examined in this paper. Panel B, in turn, furnishes summary statistics for the complete sample within the framework of our primary valuation model. Our sample consists of 452 Latin American public firms (3253 firm-year observations) with data available from Argentina, Brazil, Chile, Colombia, Mexico, and Peru over the sample period of 2003–2018. Big 4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; Cash/Total Assets is the ratio of Cash and Cash Equivalents to Total Assets; Market-to-book was calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; Total Debt is the sum of Short and Long Term Debt to Total Assets; Size is the natural logarithm of Total Assets in $ million; Revenue is the natural logarithm of Total Revenues in $ million; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *GDP* was computed as the annual percentage growth rate of each country GDP.

feasible for many companies, leading to a higher prevalence of non-Big 4 auditors. Finally, international exposure and companies' strategic goals can affect auditor choice. Firms with significant international operations or those seeking to attract foreign investment may prefer Big 4 auditors due to their global presence and reputation.

Returning to Panel A of Table 1, we observe that Latin American publicly traded companies exhibit an average annual sales growth rate of 6.36%. Regarding firm value, companies' market values are higher for Brazilian (1.113) and Mexican (1.166) enterprises, with a mean market-to-book ratio of 1.088 for the entire sample. Additionally, on average, Latin American public companies retain 9.64% of their total assets in the form of cash and cash equivalents. The ratio of cash to total assets exhibits variability, with Brazilian firms showing the highest ratio (13.48%), while Peruvian companies have the lowest ratio at 5.72%. Turning to Panel B of Table 1, we observe that the mean and median values of the change in cash holdings ($dCash_{i,t}$) are close to zero, suggesting that the distribution of the change in cash balances is relatively symmetric.

4 Results

4.1 Main results

Table 2 reports the results of our valuation model described in Eq. 2. The valuation regression has the market-to-book ratio as the left-hand-side variable. Unreported variance inflation factors (VIF) test results indicate that multicollinearity is not a concern since all VIF values are below the threshold indicator of 10. Robust standard errors are presented in parentheses based on White robust standard error. In Panel A of Table 2, we first estimate the value of cash for the entire sample of firms from Latin America without controlling for differences in audit quality. Subsequently, in Panel B of Table 2, we display the results of our valuation approach described in Eq. 2, which includes the Big 4 dummy variable ($BIG4_{i,t}$) and its interaction term with the change in cash assets ($dCash_{i,t} * BIG4_{i,t}$).

As noted earlier, the coefficient on the change in cash holdings ($dCash_{i,t}$) reflects the magnitude of the potential for value destruction or creation perceived by shareholders (Frésard and Salva 2010). Therefore, the firm fixed effects estimates presented in Panel A of Table 2 reveal that the inclusion of one dollar in a firm's cash holdings corresponds to an increase in the market-to-book ratio of $0.451. This inference is supported by the positive and statistically significant estimated coefficient on the contemporaneous change in cash holdings (β_{14}), which stands at 0.451. Thus, in Panel A of Table 2, we observe that investors indeed discount the market value of cash in Latin America. By and large, this result is consistent with the free cash flow hypothesis and suggests that when expected agency conflicts are large and cash balances are freely accessible to managers, shareholders identify the potential private benefits embodied in cash and consequently discount their value (e.g., Pinkowitz et al. 2006; Kalcheva and Lins 2007; Drobetz et al. 2010; Frésard and Salva 2010; Manoel et al. 2023, 2025).

Of the control variables, we can observe that most of them are statistically significant in the predicted directions relative to previous research on the market value of cash (Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Manoel et al. 2023). For example, Panel A reveals that firms with better growth opportunities have a greater market-to-book ratio. Moreover, both dividends and the earnings variable demonstrate positive and statistically

Table 2 Firm fixed effects estimate of Eq. 2

Panel A		Panel B	
Variables	Coefficient	Variables	Coefficient
Constant	0.876*** (0.317)	Constant	0.895*** (0.341)
$E_{i,t}$	1.986*** (0.638)	$E_{i,t}$	1.987*** (0.638)
$dE_{i,t}$	−0.319** (0.147)	$dE_{i,t}$	−0.316** (0.147)
$dE_{i,t+1}$	1.292** (0.529)	$dE_{i,t+1}$	1.294** (0.529)
$dNa_{i,t}$	−0.122* (0.065)	$dNa_{i,t}$	−0.122* (0.066)
$dNa_{i,t+1}$	0.348*** (0.069)	$dNa_{i,t+1}$	0.348*** (0.069)
$GrowthOpportunities_{i,t}$	0.139** (0.069)	$GrowthOpportunities_{i,t}$	0.138** (0.069)
$I_{i,t}$	1.821 (3.401)	$I_{i,t}$	1.821 (3.399)
$dI_{i,t}$	−0.214 (0.948)	$dI_{i,t}$	−0.208 (0.948)
$dI_{i,t+1}$	0.848 (1.719)	$dI_{i,t+1}$	0.853 (1.716)
$D_{i,t}$	3.996*** (1.066)	$D_{i,t}$	3.992*** (1.066)
$dD_{i,t}$	−1.366*** (0.481)	$dD_{i,t}$	−1.389*** (0.505)
$dD_{i,t+1}$	1.223** (0.586)	$dD_{i,t+1}$	1.219** (0.588)
$dV_{i,t+1}$	−0.545*** (0.012)	$dV_{i,t+1}$	−0.545*** (0.012)
$dCash_{i,t}$	0.451* (0.266)	$dCash_{i,t}$	0.609* (0.323)
$BIG4_{i,t}$	–	$BIG4_{i,t}$	−0.022 (0.070)
$dCash_{i,t} * BIG4_{i,t}$	–	$dCash_{i,t} * BIG4_{i,t}$	−0.196 (0.365)
$dCash_{i,t+1}$	1.408*** (0.470)	$dCash_{i,t+1}$	1.405*** (0.470)
GDP	0.034 (0.023)	GDP	0.034 (0.023)
Adjusted R^2	0.577	Adjusted R^2	0.577
p-value	0.000	*p*-value	0.000
Year effects	Yes	Year effects	Yes
Observations	3,253	Observations	3,253

Table reports the results from estimating Eq. 2 with firm and year fixed effects. The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG4* is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year

Table 2 (continued)

and 0 otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

significant coefficients. Notably, the estimated coefficient of GDP, serving as an indicator of economic development, is insignificant.

It is also important to note in Panel A of Table 2 that, contrary to Pinkowitz et al. (2006), who found that contemporaneous cash changes ($dCash_{i,t}$) are valued more highly than future cash changes ($dCash_{i,t+1}$), our results show the opposite. Specifically, Panel A of Table 2 reveals that the coefficient for ($dCash_{i,t}$) is statistically significant with a value of 0.451, while the coefficient for ($dCash_{i,t+1}$) is also statistically significant with a value of 1.408, indicating that future cash changes are valued substantially higher than contemporaneous cash changes. One might intuitively argue that, due to the discount rate, the coefficient for contemporaneous cash changes ($dCash_{i,t}$) should be higher than that for future cash changes ($dCash_{i,t+1}$), since future cash flows are discounted to their present value. However, this view overlooks the dynamic nature of the market value of cash and the influence of forward-looking market behavior.

The characteristics of emerging markets, such as elevated economic uncertainty, weaker investor protection, and a distinct institutional environment, can influence these results. In such markets, future cash flows might be more highly valued due to the perceived higher risk and uncertainty associated with current cash flows as a form of potential value added to the firm. Additionally, investors in emerging markets may place a higher value on future cash flows due to their strategic importance. Firms in these markets may face significant growth opportunities that can be capitalized on with future cash reserves. Consequently, investors might value future cash reserves more highly because they are seen as crucial for leveraging these opportunities. However, we recognize that this result, which diverges from that obtained by Pinkowitz et al. (2006), highlights the need for further research to explore the conditions under which the coefficient for contemporaneous cash changes may be lower or higher than that for future cash changes.[6]

Examining Panel B of Table 2, the results support the research hypothesis proposed in this study. Specifically, the coefficient estimate for the interaction between the Big 4 auditor dummy variable and the contemporaneous change in cash assets ($dCash_{i,t} * BIG4_{i,t}$) is negative, though statistically insignificant at conventional levels. This finding suggests that, contrary to expectations of a higher market valuation for cash holdings in firms audited by the Big 4 compared to those audited by non-Big 4 auditors, there is no statistically significant difference in how investors value cash reserves between these two categories within the Latin American context. In other words, the results indicate that the market does not differentiate between Big 4 and non-Big 4 auditors in terms of their impact on the valuation of corporate cash holdings. Thus, unlike the evidence of Huang et al. (2019) for the U.S. setting,[7] we do not find statistically significant evidence of a valuation premium

[6] We extend our gratitude to the anonymous referee for their valuable insights on this point.

[7] In a related study, Kim et al. (2015) provided evidence from a sample of U.S. public firms indicating that high-quality audits play a distinct and incremental role in reducing the risk of improper cash diversion. As a result, investors assign a valuation premium of 34 cents for each additional dollar of cash held by clients of joint national- and city-level industry-specialized auditors. In contrast, our findings suggest that the appointment of a Big 4 auditor, as a proxy for audit quality, does not significantly increase the value that

regarding the value investors attach to cash holdings in Latin America when a company is audited by a Big 4.

4.2 Robustness checks

In this subsection, we performed various analyses to check the robustness of our findings. To be concise, we report only some of the results.[8]

Alternative proxy of firm value: as the first robustness check, we examine whether our results hold for an alternative proxy of firm value. More precisely, we reestimate our initial model with Tobin's Q as our measure of firm value, which is calculated as the ratio of the firm's market value to total assets instead of the market-to-book ratio (Kalcheva and Lins 2007; Manoel et al. 2023). No other variables and specifications of Eq. 2 are redefined. The results are presented in Table 3.

The findings displayed in Table 3 align with our research hypothesis and substantiate the results reported in Table 2.

An alternative specification: a potential issue with the valuation model of Pinkowitz et al. (2006) is that an increase in cash holdings could alter expectations regarding future growth. To address this concern, Pinkowitz et al. (2006) suggest substituting the lead and lag of cash changes with actual cash levels, measured as cash and cash equivalents to total assets, in an alternative specification. Following this recommended approach, we also employ cash levels rather than cash changes as a robustness check. The alternative regression specification can be observed in Eq. 3.

$$\begin{aligned} V_{i,t} = {} & \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} \\ & + \beta_6\, Growth\ Opportunities_{i,t} + \beta_7 I_{i,t} + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} \\ & + \beta_{13} dV_{i,t+1} + \beta_{14} Cash_{i,t} + \beta_{15} BIG4_{i,t} + \beta_{16} Cash_{i,t} * BIG4_{i,t} + \beta_{17} GDP_{i,t} + \epsilon_{i,t} \end{aligned} \tag{3}$$

The coefficient on cash levels ($Cash_{i,t}$) in this specification reflects the firm's value responsiveness to an additional dollar in cash holdings (Pinkowitz et al. 2006). Pinkowitz and Williamson (2006) refer to Eq. 3 as reflecting the "levels values," whereas Eq. 2 captures the "change values." In this revised model, the primary focus is on the coefficient of the interaction term between cash levels and the Big 4 dummy variable ($Cash_{i,t} * BIG4_{i,t}$). All other variables and specifications in our primary model (Eq. 2) remain unchanged in Eq. 3. The new results are displayed in Table 4.

In Panel A of Table 4, we first observe that the market value of cash in Latin America is notably less than one dollar. The coefficient for actual cash levels ($Cash_{i,t}$), which stands at 0.651 and is statistically significant at the 1% level, supports this conclusion. Our preliminary results, therefore, are substantiated by this finding, suggesting that, due

Footnote 7 (Continued)

the market attaches to a firm's cash holdings compared to the appointment of non-Big 4 auditors. However, it is important to highlight a limitation of our research: Latin American companies do not disclose in the notes attached to their annual reports which specific audit firm performed the entire process. Instead, they only disclose whether a Big 4 or non-Big 4 auditor was responsible for the audit. Consequently, we lack information about auditor industry specialization, which restricts our ability to directly compare our findings with those of Kim et al. (2015). It is also worth noting that, in one of their untabulated results, Kim et al. (2015) found that the market value of cash is 30 cents higher for Big 4 clients compared to non-Big 4 clients.

[8] All unreported results are available upon request.

Table 3 Firm Fixed effects estimate of Eq. 2 with Tobin's Q as the new left-hand-side variable

Panel A		Panel B	
Variables	Coefficient	Variables	Coefficient
Constant	0.647** (0.319)	Constant	0.678** (0.342)
$E_{i,t}$	2.356*** (0.703)	$E_{i,t}$	2.358*** (0.704)
$dE_{i,t}$	−0.361** (0.172)	$dE_{i,t}$	−0.359** (0.171)
$dE_{i,t+1}$	1.509*** (0.565)	$dE_{i,t+1}$	1.511*** (0.565)
$dNa_{i,t}$	−0.127* (0.069)	$dNa_{i,t}$	−0.128* (0.070)
$dNa_{i,t+1}$	0.188** (0.077)	$dNa_{i,t+1}$	0.188** (0.077)
$GrowthOpportunities_{i,t}$	0.140** (0.070)	$GrowthOpportunities_{i,t}$	0.138** (0.069)
$I_{i,t}$	0.533 (3.520)	$I_{i,t}$	0.536 (3.517)
$dI_{i,t}$	−0.299 (1.098)	$dI_{i,t}$	−0.292 (1.097)
$dI_{i,t+1}$	−0.357 (1.841)	$dI_{i,t+1}$	−0.350 (1.837)
$D_{i,t}$	4.600*** (1.071)	$D_{i,t}$	4.593*** (1.070)
$dD_{i,t}$	−1.460*** (0.477)	$dD_{i,t}$	−1.482*** (0.502)
$dD_{i,t+1}$	1.625*** (0.568)	$dD_{i,t+1}$	1.620*** (0.569)
$dV_{i,t+1}$	−0.545*** (0.012)	$dV_{i,t+1}$	−0.545*** (0.012)
$dCash_{i,t}$	0.464* (0.271)	$dCash_{i,t}$	0.638* (0.347)
$BIG4_{i,t}$	–	$BIG4_{i,t}$	−0.034 (0.070)
$dCash_{i,t} * BIG4_{i,t}$	–	$dCash_{i,t} * BIG4_{i,t}$	−0.217 (0.382)
$dCash_{i,t+1}$	1.232** (0.499)	$dCash_{i,t+1}$	1.229** (0.500)
GDP	0.031 (0.023)	GDP	0.030 (0.023)
Adjusted R^2	0.576	Adjusted R^2	0.576
p-value	0.000	*p*-value	0.000
Year effects	Yes	Year effects	Yes
Observations	3,253	Observations	3,253

Table reports the results from estimating Eq. 2 with firm and year fixed effects. The dependent variable is the market value of the firm (Tobin's Q), which is calculated as the ratio of the firm's market value to total assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG*4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

to weak investor protection in Latin American countries, investors ascribe a considerably lower value to cash balances (e.g., Pinkowitz et al. 2006; Kalcheva and Lins 2007; Drobetz et al. 2010; Frésard and Salva 2010; Manoel et al. 2023, 2025).

In Panel B, when we consider differences in audit quality by incorporating the Big 4 dummy variable ($BIG4_{i,t}$) and its interaction term with actual cash levels ($Cash_{i,t} * BIG4_{i,t}$), our findings remain consistent with our research hypothesis. Specifically, the estimated coefficient on the interaction term between actual cash levels and the Big 4 dummy variable is insignificant. Therefore, in both the change and level valuation regressions, we obtain evidence suggesting that investors do not differentiate between Big 4 and non-Big 4 auditors in terms of their impact on the valuation of corporate cash holdings.

Exclusion of U.S. cross-listed companies: in sequence, we eliminate Latin American firms cross-listed on U.S. exchanges from our sample (337 observations). Cross-listing in the U.S. through ADRs (American Depositary Receipts) improves disclosure and investor protection, which limits the consumption of private benefits embodied in cash holdings (Frésard and Salva 2010). In light of these arguments, Frésard and Salva (2010) document that investors do increase the value they place on excess cash when companies access the U.S. market. Therefore, we re-ran our main analysis after excluding from the sample those companies from Latin America that cross-list their shares on U.S. exchanges. Unreported results, to conserve space, indicate that our main conclusions remain unchanged after removing the bonding effect of cross-listing on U.S. markets.

Controlling for cross-country differences: as a further robustness test, we augment Eq. 2 with two additional variables[9] to control for cross-country differences that may affect audit quality and auditor choice (Michas 2011). In the spirit of Michas (2011), we control for the rule of law and investor protection. The rule of law variable is obtained from the Worldwide Governance Indicators (WGI) project. Investor protection is measured using the anti-director rights index developed by La Porta et al. (1998). By accounting for investor protection, we acknowledge the potential that firms in more stringent legal environments are more likely to engage a Big 4 auditor (Choi and Wong 2007).

Unreported results show that our findings remain unchanged. The coefficients on the rule of law and the anti-director rights index are negative but insignificant. Thus, after controlling for the rule of law and investor protection, the estimates do not support the argument that shareholders place a significantly higher value on cash holdings in firms audited by a Big 4 auditor.

Heckman's (1979) *two-stage procedure:* previous studies caution against treating auditor type (Big 4 or not) as an exogenous variable, highlighting the non-random assignment of auditors to client firms and the impact of unobservable factors on a firm's decision to engage a Big 4 auditor (Ireland and Lennox 2002; Chaney et al. 2004; Jiang et al. 2019). The literature indicates, for instance, that firms with significant agency problems are more likely to opt for a Big 4 auditor (Fan and Wong 2005). Furthermore, Francis (2004) suggests that "good" companies are more prone to engaging high-quality auditors. Big 4 auditors may also exhibit greater discernment in selecting and retaining high-risk audit clients (Lawrence et al. 2011; Aobdia et al. 2021). Consequently, the choice of auditor is endogenous (Defond et al. 2017).

[9] Considering that the Latin American countries in our sample—Argentina, Brazil, Chile, Colombia, Mexico, and Peru—share a common legal origin rooted in the French Civil Law tradition, it is unnecessary to include distinctions between common law and civil law legal systems as an additional institutional control variable.

Table 4 Firm fixed effects estimate of Eq. 3

Panel A		Panel B	
Variables	Coefficient	Variables	Coefficient
Constant	0.461*** (0.105)	Constant	0.469*** (0.127)
$E_{i,t}$	1.745*** (0.451)	$E_{i,t}$	1.747*** (0.451)
$dE_{i,t}$	−0.404** (0.195)	$dE_{i,t}$	−0.407** (0.194)
$dE_{i,t+1}$	0.904*** (0.218)	$dE_{i,t+1}$	0.906*** (0.218)
$dNa_{i,t}$	0.021 (0.008)	$dNa_{i,t}$	0.023 (0.080)
$dNa_{i,t+1}$	0.516*** (0.067)	$dNa_{i,t+1}$	0.516*** (0.067)
$GrowthOpportunities_{i,t}$	0.166*** (0.056)	$GrowthOpportunities_{i,t}$	0.165*** (0.056)
$I_{i,t}$	4.405*** (1.436)	$I_{i,t}$	4.399*** (1.429)
$dI_{i,t}$	−1.935* (1.001)	$dI_{i,t}$	−1.920* (1.000)
$dI_{i,t+1}$	0.932 (0.888)	$dI_{i,t+1}$	0.903 (0.887)
$D_{i,t}$	4.599*** (1.093)	$D_{i,t}$	4.613*** (1.085)
$dD_{i,t}$	−0.619 (0.638)	$dD_{i,t}$	−0.630 (0.637)
$dD_{i,t+1}$	1.945*** (0.618)	$dD_{i,t+1}$	1.933*** (0.620)
$dV_{i,t+1}$	−0.353*** (0.035)	$dV_{i,t+1}$	−0.353*** (0.035)
$Cash_{i,t}$	0.652** (0.265)	$Cash_{i,t}$	0.419 (0.550)
$BIG4_{i,t}$	–	$BIG4_{i,t}$	−0.013 (0.070)
$Cash_{i,t} * BIG4_{i,t}$	—	$Cash_{i,t} * BIG4_{i,t}$	0.326 (0.581)
GDP	0.015** (0.006)	GDP	0.015** (0.006)
Adjusted R^2	0.257	Adjusted R^2	0.261
p-value	0.000	*p*-value	0.000
Year effects	Yes	Year effects	Yes
Observations	3,253	Observations	3,253

Table reports the results from estimating Eq. 3 with firm and year fixed effects. The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG*4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

Self-selection bias, which is one form of endogeneity, is a well-documented concern in the auditing literature, casting doubts on the existence of a Big 4 effect (Lawrence et al. 2011; Lennox et al. 2012; Defond et al. 2017). In this respect, the literature indicates that conventional OLS estimates of the Big 4 premium are potentially biased (Chaney et al. 2004). To increase this study's validity and address the auditor's self-selection bias resulting from unobservable factors, we employ Heckman's (1979) two-stage procedure as a further robustness check.

In the first stage (Eq. 4), we estimate a probit regression where the dependent variable is a dummy that equals 1 if a Big 4 auditor audits a firm and 0 otherwise. Then, we follow the procedure used in Ireland and Lennox (2002), Chaney et al. (2004), Choi and Wong (2007), and Lennox et al. (2012) and we include these variables as instruments: size (log of total assets); asset turnover (sales/total assets); leverage (total debt/total assets); return on assets (earnings before interest and taxes to total assets); return on assets*loss (return on assets multiplied by 1 if a company has negative net income, and multiplied by 0 otherwise); current assets (current assets/total assets); and long-term debt (LTD) (long-term debt/total assets).

$$\begin{aligned}\text{Probit Regression: } Big4 = {} & \alpha_0 + \alpha_1 Size_{i,t} + \alpha_2 AssetTurnover_{i,t} + \alpha_3 Leverage_{i,t} \\ & + \alpha_4 ROA_{i,t} + \alpha_5 ROA * Loss_{i,t} + \alpha_6 CurrentAssets_{i,t} \\ & + \alpha_7 LTD_{i,t} + u_{i,t}\end{aligned} \tag{4}$$

$$\begin{aligned}\text{OLS Regression: } V_{i,t} = {} & \beta_0 + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} \\ & + \beta_6 Growth\ Opportunities_{i,t} + \beta_7 I_{i,t} + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} \\ & + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} + \beta_{13} dV_{i,t+1} \\ & + \beta_{14} dCash_{i,t} + \beta_{15} BIG4_{i,t} + \beta_{16} dCash_{i,t} * BIG4_{i,t} \\ & + \beta_{17} dCash_{i,t+1} + \beta_{18} GDP_{i,t} + \beta_{19} \lambda_{i,t} + \varepsilon_{i,t}\end{aligned} \tag{5}$$

In the second stage, the inverse Mill's ratio ($\beta_{19}\lambda_{i,t}$) obtained in the first stage (Eq. 4) is included as an additional explanatory variable to control for potential self-selection bias. In addition to year fixed effects, we also include industry and country fixed effects in the OLS regression (Eq. 5) to control for industry-specific factors and cross-country differences. Panel A of Table 5 displays results from the first-step probit regression.

The results of the first-stage probit estimations (Panel A of Table 5) reveal that larger companies, those with greater current assets, and firms with higher long-term debt are more likely to appoint a Big 4 auditor. Conversely, the presence of a recent loss, denoted by the interaction term ROA*Loss, is negatively associated with the selection of a Big 4 auditor.

In Panel B of Table 5, we present the results of the OLS estimation. Using this model, we reject the null hypothesis that clients are randomly allocated across Big 4 and non-Big 4 auditors, given that the inverse Mills ratio is statistically significant at the 1% level. Despite the presence of selection bias, our empirical results with the two-stage Heckman approach[10] reveal that the value investors attach to a dollar of cash of a Big 4 client does not differ significantly from the value they place on the cash of a non-Big 4 client, as evidenced by the non-significant estimated coefficient $dCash_{i,t} * BIG4_{i,t}$.

[10] The econometrics literature suggests that the Heckman model is sensitive to severe collinearity problems (Lennox et al. 2012). However, we mention that multicollinearity is not a concern in our selection model, as VIF values are below 10.

Propensity score matching model: the standard procedure for controlling for self-selection bias is the approach developed by Heckman (1979) (Lennox et al. 2012). However, the significance of the coefficient on the inverse Mills ratio in Panel B of Table 5 indicates the need for greater control for self-selection bias in our research. Thus, in addition to employing Heckman's (1979) procedure to account for self-selection based on unobservable factors, we also utilize the propensity score matching model. This model, widely used in accounting and finance research, further mitigates endogeneity in firms' selection of a Big 4 or non-Big 4 audit firm. According to DeFond et al. (2017), the propensity score matching model matches non-Big 4 clients to Big 4 clients based on a propensity score derived from observable, not unobservable, client characteristics. Our propensity score matching model with no replacement match observations is based on the probability of selecting a Big 4 auditor, generating a sample in which the Big 4 and non-Big 4 clients are similar. We estimate the propensity score using the same probit model of Eq. 4 that regresses the Big 4 dummy variable on the following client characteristics: size, asset turnover, leverage, return on assets, return on assets*loss, current assets, and long-term debt.

For each non-Big 4 client (896 firm-year observations), we identify its matched Big audit client with the closest propensity score each year based on the aforementioned client characteristics. Our matching procedure generates a sample of 1,796 firm-year observations with equal observations for Big 4 and non-Big 4 audit clients. In Table 6, we reestimate Eq. 2 using this matched sample.

The results in Table 6 show that the coefficient of interest ($dCash_{i,t} * BIG4_{i,t}$) is again insignificant. Hence, the results when we employ the propensity score matching approach to address selection on observable firm characteristics further confirm our predictions.

The subprime crisis: as highlighted by Kim et al. (2015), the valuation of a dollar of cash by investors may experience an increase during crises due to the heightened utility of cash assets for firms in such challenging circumstances. Our study period spans from 2003 to 2018, covering the Subprime Crisis years (2007–2009). It is conceivable that during this specific timeframe, shareholders assigned heightened significance to cash balances due to escalated costs and the scarcity of external funding sources in periods of crisis (Kim et al. 2015). In consideration of this argument, we conduct an additional robustness check by re-examining our baseline valuation approach for three distinct periods: pre-subprime crisis (2003–2006), post-crisis (2010–2018), and with the exclusion of the credit crunch years (2007–2009) from our sample period. Untabulated findings, omitted for brevity, indicate the robustness of our main empirical results, revealing that the Subprime Crisis does not influence them.

4.3 Additional analysis

4.3.1 Audit change

As our first additional analysis, we examine whether the market value of cash increases when a client switches to a higher-quality auditor, i.e., when a company switches from a non-Big 4 to a Big 4 auditor. During our sample period from 2003 to 2018, 63 (68) firm-year observations switched from non-Big 4 (Big 4) to Big 4 (non-Big 4) auditors. Following Kim et al. (2015), for these 63 changes from non-Big 4 to Big 4 auditors, we compare the market value of cash between three years before and after the changes

Table 5 The Influence of Audit Quality on the Market Value of Cash by using Heckman's (1979) two-step selection model

Panel A: Probit estimation—first stage		Panel B: OLS Estimation with the inverse Mills ratio—second stage	
Variables	Coefficient	Variables	Coefficient
Constant	−3.481*** (0.370)	Constant	0.465** (0.214)
$Size_{i,t}$	0.204*** (0.017)	$E_{i,t}$	1.586*** (0.264)
$AssetTurnover_{i,t}$	0.048 (0.054)	$dE_{i,t}$	−0.187 (0.182)
$Leverage_{i,t}$	−0.217 (0.244)	$dE_{i,t+1}$	1.444*** (0.229)
$ROA_{i,t}$	0.427 (0.385)	$dNa_{i,t}$	−0.010 (0.099)
$ROA_{i,t} * Loss_{i,t}$	−0.531* (0.295)	$dNa_{i,t+1}$	0.316*** (0.072)
$CurrentAssets_{i,t}$	0.236* (0.137)	$GrowthOpportunities_{i,t}$	0.273*** (0.103)
$LTD_{i,t}$	0.548* (0.299)	$I_{i,t}$	1.797* (0.934)
Pseudo R^2	0.066	$dI_{i,t}$	−0.254 (0.811)
p-value	0.000	$dI_{i,t+1}$	1.915* (1.078)
Observations	3253	$D_{i,t}$	7.074*** (0.695)
Year effects	Yes	$dD_{i,t}$	−1.630** (0.670)
		$dD_{i,t+1}$	2.621*** (0.669)
		$dV_{i,t+1}$	−0.550*** (0.011)
		$dCash_{i,t}$	0.842 (0.692)
		$BIG4_{i,t}$	0.122** (0.051)
		$dCash_{i,t} * BIG4_{i,t}$	0.697 (0.762)
		$dCash_{i,t+1}$	2.298*** (0.279)
		GDP	0.025** (0.011)
		$\lambda_{i,t}$	−0.610*** (0.143)
		Adjusted R^2	0.494
		p-value	0.000
		Country effects	Yes
		Industry effects	Yes
		Year effects	Yes
		Observations	3,253

Table 5 (continued)

Panel A of Table reports results from the first-step probit regression (selection equation). The dependent variable of Panel A is a dummy that equals 1 if a Big 4 auditor audits a firm in year t, and 0 otherwise; *Size* is the natural logarithm of total assets; *AssetTurnover* is total sales to total assets; *Leverage* is the ratio of total debt to total assets; *ReturnonAssets*(*ROA*) is earnings before interest and taxes to total assets; $ROA * Loss$ is Return on Assets multiplied by 1 if a company has negative net income, and multiplied by 0 otherwise; *CurrentAssets* is current assets to total assets; *LTD* (Long-Term Debt) is the long-term debt to total assets. Panel B of Table reports the results from the second stage (outcome equation). The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *GDP* was computed as the annual percentage growth rate of each country GDP; $\lambda_{i,t}$(Lambda) refers to the inverse Mills ratios; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

by creating a dummy variable $Post_{i,t}$, defined as 1 (0) for the firm-year observations that belong to the three years after (before) the changed. In addition to this dummy variable, we also add its interaction with the change in cash holdings ($dCash_{i,t} * Post_{i,t}$), as follows:

$$\begin{aligned} V_{i,t} = {} & \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} \\ & + \beta_6 Growth\ Opportunities_{i,t} + \beta_7 I_{i,t} \\ & + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} + \beta_{13} dV_{i,t+1} \\ & + \beta_{14} dCash_{i,t} + \beta_{15} BIG4_{i,t} + \beta_{16} dCash_{i,t} * BIG4_{i,t} + \beta_{17} Post_{i,t} \\ & + \beta_{18} dCash_{i,t} * Post_{i,t} + \beta_{19} dCash_{i,t+1} + \beta_{20} GDP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{6}$$

Table 7 displays the regression results of estimating Eq. 6.

The results in Table 7 show that switching from a non-Big 4 to a Big 4 does not increase the market value of cash, given that the coefficient on the interaction term β_{18} ($dCash_{i,t} * Post_{i,t}$) is insignificant. Therefore, the results displayed in Table 7 reveal that investors do not place a significantly higher value on the cash of those companies that switch from non-Big 4 to Big 4 auditors. Overall, the results of this additional analysis suggest that our main conclusions are unlikely to be driven by potential endogeneity concerns related to a firm's decision to voluntarily switch from a non-Big 4 to a Big 4 auditor.

4.3.2 Controlling for corporate governance and financial reporting quality

Previous literature documents that the market value of cash is higher in firms with good governance because governance mechanisms can mitigate the principal-agent problem associated with holding cash. In the presence of weak governance structures, however, self-interested managers are better able to use cash holdings to pursue their own private benefits. As a result, the market value of cash is discounted at poorly governed firms because the contribution of corporate cash holdings to firm value is lower in such companies (Dittmar and Mahrt-Smith 2007; Frésard and Salva 2010; Louis et al. 2012; Manoel et al. 2023).

Table 6 Propensity matching score (PMS) approach

Variables	Coefficient
Constant	1.300** (0.643)
$E_{i,t}$	1.747** (0.846)
$dE_{i,t}$	−0.437 (0.266)
$dE_{i,t+1}$	0.914* (0.522)
$dNa_{i,t}$	−0.188 (0.124)
$dNa_{i,t+1}$	0.314** (0.124)
$GrowthOpportunities_{i,t}$	0.185 (0.148)
$I_{i,t}$	−1.503 (5.756)
$dI_{i,t}$	1.337 (2.207)
$dI_{i,t+1}$	−0.299 (2.602)
$D_{i,t}$	1.811 (1.452)
$dD_{i,t}$	−0.722 (0.539)
$dD_{i,t+1}$	0.369 (0.734)
$dV_{i,t+1}$	−0.543*** (0.007)
$dCash_{i,t}$	0.746* (0.440)
$BIG4_{i,t}$	−0.003 (0.112)
$dCash_{i,t} * BIG4_{i,t}$	−0.128 (0.415)
$dCash_{i,t+1}$	2.183*** (0.637)
GDP	0.042 (0.037)
Adjusted R^2	0.621
p-value	0.000
Year effects	Yes
Observations	1796

Table reports the results with the Propensity Matching Score approach for the non-Big 4 and the matched Big 4 sample. The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG*4 is a dummy variable that takes the

Table 6 (continued)

value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

Considering that external auditing serves as a governance mechanism, it would be ideal to isolate the perceived audit quality effect from the influence of other governance mechanisms. However, we did not control for corporate governance in our main analyses because requiring governance data substantially reduces the sample size, which is already limited in the Latin American context. Nonetheless, to assess the robustness of our results when controlling for other governance mechanisms, we augment Eq. 2 in this subsection with two corporate governance proxies: (1) Management Score and (2) Accounting Conservatism.

1. Management Score: Developed by Thomson Reuters, the Management Score measures a company's commitment to and effectiveness in adhering to best practice corporate governance principles. This score is calculated using percentile rank scoring and ranges from 0 to 100, with higher values indicating stronger governance and lower values indicating weaker governance.
2. Accounting Conservatism: The literature suggests that accounting conservatism is a governance mechanism that may reduce information asymmetry and agency conflicts. More specifically, conservative accounting policies can incentivize *ex-ante* efficient investment decisions and facilitate *ex-post* monitoring of managers' investment decisions (Louis et al. 2012). Consistent with this argument, Louis et al. (2012) document that shareholders assign a higher value to cash in firms that adopt more conservative financial reporting policies. The authors attribute this result to the fact that accounting conservatism is a governance mechanism limiting managers' ability to expropriate cash holdings for personal benefit. As a result of the reduction of improper diversion of cash, the market value of cash increases with accounting conservatism. Thus, in the spirit of Louis et al. (2012), we include the accruals before depreciation ($CONACC_{i,t}$), measured as net income before extraordinary items plus depreciation less operating cash flows multiplied by −1 and deflated by total assets cumulated over the previous three years, as a firm-level proxy of conservatism to control for the effects of accounting conservatism on the market value of cash. A higher value of $CONACC_{i,t}$ means more conservative accounting policies.

In these additional analyses, we augment Eq. 2 with the governance measures ($ManagementScore_{i,t}$ and $CONACC_{i,t}$, one at a time) and their interaction with the change in cash holdings. The new model[11] (Eq. 7) is defined as follows:

$$\begin{aligned} V_{i,t} = {} & \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} + \beta_6 Growth\ Opportunities_{i,t} + \beta_7 I_{i,t} + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} \\ & + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} + \beta_{13} dV_{i,t+1} + \beta_{14} dCash_{i,t} + \beta_{15} BIG4_{i,t} + \beta_{16} dCash_{i,t} * BIG4_{i,t} \\ & + \beta_{17} Governance_{i,t} + \beta_{18} dCash_{i,t} * Governance_{i,t} + \beta_{19} dCash_{i,t+1} + \beta_{20} GDP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{7}$$

[11] Considering that the variable market-to-book is also used as a proxy of accounting conservatism (Louis et al. 2012), we opt to use Tobin's Q as our dependent variable in the model we control for the effects of conservative accounting policies. When we control for Management Score, the dependent variable is the market-to-book ratio.

Table 7 Audit changes and the market value of cash

Variables	Coefficient
Constant	0.422* (0.212)
$E_{i,t}$	1.142* (0.636)
$dE_{i,t}$	− 0.715** (0.334)
$dE_{i,t+1}$	− 0.331 (0.320)
$dNa_{i,t}$	− 0.270* (0.141)
$dNa_{i,t+1}$	0.061 (0.086)
$GrowthOpportunities_{i,t}$	0.295*** (0.075)
$I_{i,t}$	− 0.168 (1.485)
$dI_{i,t}$	1.709* (0.979)
$dI_{i,t+1}$	0.870 (1.008)
$D_{i,t}$	0.000 (0.002)
$dD_{i,t}$	0.003* (0.002)
$dD_{i,t+1}$	0.001 (0.002)
$dV_{i,t+1}$	0.043 (0.117)
$dCash_{i,t}$	− 0.253 (0.454)
$BIG4_{i,t}$	0.270** (0.135)
$dCash_{i,t} * BIG4_{i,t}$	− 6.130 (4.813)
$Post_{i,t}$	− 0.283* (0.145)
$dCash_{i,t} * Post_{i,t}$	5.718 (4.783)
$dCash_{i,t+1}$	0.015 (0.272)
GDP	0.010 (0.011)
Adjusted R^2	0.408
p-value	0.000
Year effects	Yes
Observations	280

Table reports firm fixed effects estimations of Eq. 6. The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book

Table 7 (continued)

value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG4* is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; $Post_{i,t}$ is a dummy variable that takes the value of 1 (0) for the firm-year observations that belong to the three-year period after (before) the change from a non-Big 4 to a Big 4 auditor; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

The coefficient of interest is β_{16} ($dCash_{i,t} * BIG4_{i,t}$), which measures the effect of perceived audit quality on the market value of cash. The coefficient on the interaction term β_{18} ($dCash_{i,t} * Governance_{i,t}$) measures the market value of cash in connection with other governance mechanisms. We also include $Governance_{i,t}$ (β_{17}) as a separate explanatory variable to control for the direct influence of governance on firm value. All other variables are as previously defined in Eq. 2. Table 8 reports the results from estimating Eq. 7.

As shown in Table 8, the coefficients β_{16} are indistinguishable from zero in both models. Thus, we do not find significant evidence of a valuation premium on the cash of Big 4 clients relative to the cash of non-Big 4 clients when we control for other governance mechanisms. Regarding the results of the governance variables, Panel A of Table 8 shows that the coefficients of $ManagementScore_{i,t}$ (β_{17}) and its interaction with the change in cash holdings (β_{18}) are not statistically significant at the conventional levels.

Panel B of Table 8 shows that the coefficient on the interaction term between the proxy of accounting conservatism and the change in cash is positive and significant at the 5% level. This result is consistent with Louis et al. (2012) and suggests that the market value of an incremental dollar of cash increases with accounting conservatism. Additionally, the coefficient of the variable $CONACC_{i,t}$ is positive and statistically significant, suggesting that conservative accounting policies enhance firm value. Finally, it is relevant to note that accounting conservatism represents an important attribute of financial reporting quality. Therefore, our results are robust after controlling for financial reporting quality.

4.3.3 Audit fees

Although the literature indicates that the Big N is a proxy for audit quality with high construct validity, DeFond and Zhang (2014) recommend using multiple proxies to measure perceived audit quality when possible, as the level of assurance provided by auditors is not directly observable. The authors suggest that an alternative way to infer audit quality is to consider audit fees. DeFond and Zhang (2014) argue that audit fees can serve as a proxy for audit quality because they are expected to reflect the auditor's effort level, which is an input to the audit process associated with audit quality. One advantage of using audit fees as a proxy is that they are continuous and can capture subtle variations in audit quality (DeFond and Zhang 2014). Therefore, as an additional analysis, we use the natural logarithm of the auditor's fee as an alternative measure for audit quality (DeFond and Zhang 2014; Smith et al. 2021).

To operationalize this analysis, we hand-collect a sample of Latin American companies that voluntarily disclose information about their audit fees. The final sample in which audit

fees are available consists of 175 unique companies and 1,363 firm-year observations from 2006 to 2018. Now, instead of the Big 4 dummy variable, we add the natural logarithm of the auditor's fee and its interaction with the change in cash holdings. The other variables are the same as in Eq. 2. The coefficient of interest is β_{16} ($dCash_{i,t} * Auditfee_{i,t}$), which measures the effect of perceived audit quality on the marginal value of cash. Consistent with the research hypothesis, we expect the coefficient β_{16} to be statistically indistinguishable from zero.

The results in Table 9 confirm our previous findings: the coefficient on the interaction term β_{16} is positive but insignificant. Therefore, using this subsample, we demonstrate that our main inferences are the same when we use audit fees as an alternative measure of perceived audit quality.

4.3.4 Methodology of Faulkender and Wang (2006)

To ensure that our conclusions are robust to different specifications, we also use the methodology of Faulkender and Wang (2006) to estimate the market value of cash as an additional test. The author's model focuses on the value of cash holdings to equity holders in regressions in which excess equity returns are regressed on the change in cash holdings and other control variables that are correlated with shareholders' expectations about fundamentals that affect firm value (Faulkender and Wang 2006; Bates et al. 2018). Thus, to examine our research hypothesis, we also augment Faulkender and Wang's (2006) valuation model by adding the Big 4 dummy variable (1 if a company is audited by a Big 4 auditor, and 0 otherwise) and its interaction with the change in cash holdings. The other variables are exactly as in Faulkender and Wang (2006). Our second valuation model is:

$$\begin{aligned} r_{i,t} - R^{B}_{i,t} = {} & \gamma_0 + \gamma_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_2 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \gamma_3 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \gamma_4 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \gamma_5 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \gamma_6 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \gamma_7 \frac{C_{i,t-1}}{M_{i,t-1}} + \gamma_8 L_{i,t} \\ & + \gamma_9 \frac{NF_{i,t}}{M_{i,t-1}} + \gamma_{10} \frac{C_{i,t-1}}{M_{i,t-1}} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_{11} L_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_{12} BIG4_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_{13} BIG4_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{8}$$

where the left-hand-side variable is a firm's excess stock return over the fiscal year. It is calculated as the raw stock return of firm i during fiscal year t ($r_{i,t}$), minus the benchmark return during the same period ($R^{B}_{i,t}$). As Faulkender and Wang (2006), we use the value-weighted portfolio return of Fama–French 25 portfolios formed on size and book-to-market at the beginning of the fiscal year as the benchmark return. The Δ terms denote the changes (from year $t-1$ to year t) in explanatory variables, including cash reserves (C), earnings before extraordinary items (E), net assets (NA), R&D expenses (RD), interest expense (I), dividends (D), leverage (L) and net financing[12] (NF). Since both dependent and independent variables of the model are standardized by lagged market value, the coefficient on the change in cash holdings (γ_1) can be interpreted as an estimate of cash value (Faulkender and Wang 2006).

We examine the impact of perceived audit quality on the market value of cash by introducing an interaction term between the change in cash holdings and the Big 4 indicator ($BIG4_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}}$) in Eq. 8. The coefficient corresponding to this interaction term is the coefficient of interest in Eq. 8. Consistent with the research hypothesis, we expect this

[12] Net financing (NF) was computed as sales of common and preferred stock net of stock repurchase plus the issuance of long-term debt net of long-term debt reduction.

Table 8 The influence of audit quality on the market value of cash after controlling for corporate Governance and financial reporting quality

Panel A: Management Score		Panel B: Accounting Conservatism	
Variables	Coefficient	Variables	Coefficient
Constant	0.916*** (6.566)	Constant	0.652*** (4.131)
$E_{i,t}$	4.978*** (11.650)	$E_{i,t}$	1.487** (2.386)
$dE_{i,t}$	−0.608 (−1.872)	$dE_{i,t}$	−0.370 (−0.661)
$dE_{i,t+1}$	1.894*** (5.874)	$dE_{i,t+1}$	2.109*** (4.469)
$dNa_{i,t}$	−0.242 (−2.234)	$dNa_{i,t}$	−0.365** (−2.373)
$dNa_{i,t+1}$	−0.080 (−1.030)	$dNa_{i,t+1}$	0.267** (2.470)
$GrowthOpportunities_{i,t}$	0.270** (3.135)	$GrowthOpportunities_{i,t}$	0.255** (2.256)
$I_{i,t}$	−1.993 (−1.789)	$I_{i,t}$	1.234 (0.428)
$dI_{i,t}$	−1.087 (−1.416)	$dI_{i,t}$	−3.371 (−1.153)
$dI_{i,t+1}$	−1.396* (−1.608)	$dI_{i,t+1}$	−1.970 (−0.716)
$D_{i,t}$	0.006** (3.275)	$D_{i,t}$	−1.559 (−1.289)
$dD_{i,t}$	−0.003** (−2.409)	$dD_{i,t}$	0.794 (0.915)
$dD_{i,t+1}$	−0.000 (−0.386)	$dD_{i,t+1}$	0.202 (0.243)
$dV_{i,t+1}$	0.247*** (3.416)	$dV_{i,t+1}$	−0.000*** (−8.545)
$dCash_{i,t}$	1.115 (1.045)	$dCash_{i,t}$	−0.611 (−0,635)
$BIG4_{i,t}$	0.048 (0.456)	$BIG4_{i,t}$	−0.016 (−0.122)
$dCash_{i,t} * BIG4_{i,t}$	−1.154 (−1.052)	$dCash_{i,t} * BIG4_{i,t}$	−0.758 (−0.788)
$ManagementScore_{i,t}$	0.000 (0.019)	$AccountingConservatism_{i,t}$	7.567*** (5.029)
$dCash_{i,t} * ManagementScore_{i,t}$	−0.003 (0.369)	$dCash_{i,t} * AccountingConservatism_{i,t}$	28.495** (2.023)
$dCash_{i,t+1}$	−0.644*** (−2.590)	$dCash_{i,t+1}$	−0.149 (−0.439)
GDP	0.027*** (3.982)	GDP	−0.004 (−0.547)
Adjusted R^2	0.458	Adjusted R^2	0.127
$p-$ value	0.000	$p-$ value	0.000
Year effects	No	Year effects	No
Observations	541	Observations	1978

Table 8 (continued)

Table reports firm fixed effects estimations of Eq. 7. In Panel A, we control for the Management Score. *ManagementScore* is a governance score and was calculated using percentile rank scoring and ranges from 0 to 100; A lower score indicates weak governance, while a higher score indicates stronger governance; In Panel A, the dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets. In Panel B, we control for Accounting Conservatism. *AccountingConservatism*(*CONACC*) is our accrual-based conservatism proxy, measured as net income before extraordinary items plus depreciation less operating cash flows multiplied by −1 and deflated by total assets cumulated over the previous three years; The dependent variable in Panel B is the market value of firm (Tobin's Q), which is calculated as the ratio of the firm's market value to total assets; The other variables are the same for both models. Specifically, *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *BIG*4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

coefficient to be statistically indistinguishable from zero. As in Faulkender and Wang's (2006) article, we estimate Eq. 8 using OLS estimation with robust standard errors. Results from this alternative methodology are reported in Panel B of Table 10. In Panel A of Table 10, in turn, we estimate the market value of cash without controlling for differences in audit quality.

Panel A of Table 10 shows that the estimated coefficient on the change in cash holdings ($\Delta C_{i,t}$), which is an estimate for the market value of cash, is positive and statistically significant at the 1% level. Specifically, we estimate that the value of $1 of cash for a Latin American company is $0.388. Therefore, using Faulkender and Wang's (2006) model as a benchmark, we obtain robust evidence that the market value of an additional dollar of cash is significantly less than one dollar in Latin America. Regarding the results for the control variables, Panel A reveals that excess return is positively correlated with the change in cash holdings. Conversely, it exhibits a negative association with changes in dividends, the leverage ratio, and the interaction between the change in cash holdings and cash levels.

In Panel B of Table 10, we observe that the coefficient on the interaction term of the change in cash holdings with the Big 4 dummy variable ($BIG4_{i,t} * \frac{\Delta C_{i,t}}{M_{i,t-1}}$) is negative and insignificant. This evidence is consistent with our predictions that investors do not place a statistically significant premium on the value of cash holdings for companies audited by a Big 4 relative to non-Big 4 clients in the Latin American setting. Therefore, we obtain complementary evidence that is in line with our research hypothesis when we use Faulkender and Wang's (2006) valuation model.[13]

[13] As an additional analysis, we also examine the relationship between auditor choice and the market value of capital expenditures. This additional analysis aimed to shed light on whether the allocation of cash resources to capital investments by firms audited by Big 4 accounting firms is perceived by investors as value-enhancing compared to non-Big 4 clients. The rationale underlying this supplementary analysis is that if Big 4 auditors are more effective in monitoring and restricting managerial incentives to engage in suboptimal investment decisions, then investors may attribute a higher value to the capital expenditures of companies audited by Big 4 firms. Building on the regression model employed by Huang and Zhang (2012), our unreported results, omitted for brevity, show that the market value of capital expenditures is not significantly higher for firms audited by Big 4 accounting firms compared to those audited by non-Big 4 auditors.

Table 9 Firm Fixed effects estimate of Eq. 2 with an alternative proxy for audit quality (Audit fees)

Variables	Coefficient
Constant	0.915*** (3.173)
$E_{i,t}$	1.633*** (3.670)
$dE_{i,t}$	−0.026 (−0.119)
$dE_{i,t+1}$	0.468** (2.088)
$dNa_{i,t}$	−0.052 (−0.737)
$dNa_{i,t+1}$	0.154** (2.301)
$GrowthOpportunities_{i,t}$	0.038 (1.182)
$I_{i,t}$	−0.263 (−0.316)
$dI_{i,t}$	0.558* (1.707)
$dI_{i,t+1}$	0.388 (0.809)
$D_{i,t}$	4.868*** (2.901)
$dD_{i,t}$	−1.583** (−2.593)
$dD_{i,t+1}$	1.155 (1.182)
$dV_{i,t+1}$	−46,606.3** (−2.392)
$dCash_{i,t}$	−1.454 (−1.607)
$AuditFee_{i,t}$	−0.000 (−0.008)
$dCash_{i,t} * AuditFee_{i,t}$	0.107 (1.533)
$dCash_{i,t+1}$	0.085 (0.584)
GDP	0.051 (1.458)
Adjusted R^2	0.389
p-value	0.000
Year effects	Yes
Observations	1363

Table reports firm fixed effects estimations of Eq. 2 with an alternative proxy for audit quality (Audit fees). The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *Cash* is the sum of cash and cash equivalents; *AuditFee* is the natural logarithm of the auditor's

Table 9 (continued) fee; *GDP* was computed as the annual percentage growth rate of each country GDP; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

4.3.5 The market value of excess cash

In all preceding analyses, we did not find statistically significant evidence of a valuation premium for cash held by Big 4 clients compared to non-Big 4 clients in the Latin American context. To gain more insights into the role of audit quality as a governance mechanism, we also examine whether audit quality improves the value of cash assets in excess of requirements for operations and investment, i.e., the market value of excess cash.

Previous literature suggests agency conflicts are likely more severe when a company has excess cash holdings (Jensen 1986; Opler et al. 1999; Frésard and Salva 2010; Iskandar-Datta and Jia 2014; Smith et al. 2021; King et al. 2025). Excess cash[14] can be defined as cash held by a company that is not needed for firm operations or investments (Dittmar and Mahrt-Smith 2007; Iskandar-Datta and Jia 2014). Depending on the level of excess cash, managers may have different incentives for opportunistic behavior concerning cash expropriation. For example, excess cash can exacerbate agency problems by providing entrenched managers with additional discretionary funds to engage in value-destroying projects (Jensen 1986). Hence, excess cash may have negative implications if self-interested managers use liquid assets inefficiently (Jensen 1986; Opler et al. 1999; Frésard and Salva 2010; Smith et al. 2021) and auditors recognize the potential for greater agency conflict when firms hold higher levels of excess cash (Smith et al. 2021).

Additionally, as articulated by Smith et al. (2021), the presence of excess cash poses a risk of mismanagement due to agency conflicts. In response to the heightened risk of misallocation of excess cash and the increased workload required to document management's efforts to obscure poor performance through the manipulation of accounting data, auditors tend to institute higher audit fees. Consequently, the risk of improper cash diversion can be better captured by focusing on excess cash reserves. Extending the research hypothesis, we predict that shareholders do not assign a significant premium to the value of excess cash for clients of Big 4 auditors.

In the first step, we estimate a regression of normal cash levels on variables that explain why firms hold cash, such as precautionary, speculative, and transactional motives. Excess cash, labeled *EXCash*, is then defined as the residual of a cash levels regression, that is, the difference between actual cash and normal cash levels. To calculate excess cash, we use the following equation[15]:

$$\begin{aligned} Ln\left(\frac{Cash_{i,t}}{NA_{i,t}}\right) &= \beta_0 + \beta_1 Ln(NA_{i,t}) + \beta_2\left(\frac{FCF_{i,t}}{NA_{i,t}}\right) + \beta_3\left(\frac{NWC_{i,t}}{NA_{i,t}}\right) \\ &+ \beta_4 Growth\ Opportunities_{i,t} + \beta_5\left(\frac{Leverage_{i,t}}{NA_{i,t}}\right) + \beta_6 Dividend_{i,t} \\ &+ \beta_7 GDP_{i,t} + u_{i,t} \end{aligned} \tag{9}$$

[14] Opler et al. (1999) and Dittmar and Mahrt-Smith (2007) discuss the regression specifications of excess cash.

[15] Unreported results indicate that our main findings about the influence of audit quality on the value of excess cash are robust to different specifications of excess cash computation.

Table 10 OLS estimations of Eq. 8

Panel A		Panel B	
Variables	Coefficient	Variables	Coefficient
Constant	−0.060* (−1.659)	Constant	−0.006 (−1.683)
$^{\Delta E}i,t$	0.021 (1.225)	$^{\Delta E}i,t$	0.388*** (6.164)
$\Delta NAi,t$	0.003 (0.530)	$\Delta NAi,t$	0.023** (1.291)
$\Delta RDi,t$	−10.993 (−0.917)	$\Delta RDi,t$	0.003 (0.483)
$^{\Delta I}i,t$	−0.063 (−0.492)	$^{\Delta I}i,t$	−10.977 (−0.916)
$^{\Delta D}i,t$	−0.294* (−1.889)	$^{\Delta D}i,t$	−0.055 (−0.420)
$^{C}i,t-1$	–	$^{C}i,t-1$	−0.287** (−1.830)
$^{L}i,t$	−0.023*** (−5.819)	$^{L}i,t$	–
$^{NF}i,t$	0.009 (0.341)	$^{NF}i,t$	−0.238*** (−5.787)
$^{C}i,t-1{}^{*C}i,t$	−0.084*** (−2.730)	$^{C}i,t-1{}^{*C}i,t$	0.008 (0.335)
$^{C}i,t{}^{*L}i,t$	0.000 (0.085)	$^{C}i,t{}^{*L}i,t$	−0.085*** (−2.748)
$\Delta C_{i,t}$	0.388*** (6.182)	$\Delta C_{i,t}$	0.001 (0.175)
$BIG4i,t$	–	$BIG4i,t$	−0.001 (−1.214)
$\Delta C_{i,t} * BIG4_{i,t}$	–	$\Delta C_{i,t} * BIG4_{i,t}$	0.002 (0.175)
Adjusted R^2	0.033	Adjusted R^2	0.037
p-value	0.000	*p*-value	0.000
Country effects	Yes	Country effects	Yes
Industry effects	Yes	Industry effects	Yes
Observations	7059	Observations	7059

Table reports OLS estimations of Eq. 8 with robust standard errors. The dependent variable is a firm's excess stock return over the fiscal year. It is calculated as$r_{i,t}$, the raw stock return of firm *i* during fiscal year*t*, minus $R^{B}_{i,t}$, the benchmark return during the same period. As Faulkender and Wang (2006), we use the value-weighted portfolio return of Fama–French 25 portfolios formed on size and book-to-market at the beginning of the fiscal year as the benchmark return. The Δ terms denote the changes (from year $t-1$ to year*t*) in explanatory variables. In the regressions, *C* is cash and cash equivalents; *E* is earnings before extraordinary items; *NA* is net assets; *RD* is research and development expense (which is set equal to zero if missing); *I* is interest expense; *D* is common dividends; *L* is market leverage; *NF* is net financing; *BIG*4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; All variables, except the *BIG*4 dummy, are scaled by the lagged market value of equity. Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

where *Cash* is the sum of cash and cash equivalents; *NA* is net assets, computed as total assets less cash and cash equivalents; *FCF* is operating income minus interest and taxes; *NWC* is current assets minus current liabilities minus cash and cash equivalents; *GrowthOpportunities* is the annual percentage change in firm's sales; *Leverage* is the sum of short and long term debt; *Dividend* is a dummy variable set equal to one in years where a company pays a dividend, and zero otherwise; *GDP* was computed as the annual percentage growth rate of each country GDP. Finally, we also include firm fixed effects.

To conserve space, we do not include the results obtained from estimating Eq. 9. In the second step, we include the residual term (*EXCash*) obtained in Eq. 9 as an explanatory variable in Eq. 10. The coefficient on *EXCash* (β_{14}) measures shareholders' valuation of an additional dollar of excess cash. Additionally, we also interact *EXCash* with the *BIG*4 dummy variable. All other variables are as specified in Eq. 2.

$$\begin{aligned} V_{i,t} = {} & \alpha_i + \beta_1 E_{i,t} + \beta_2 dE_{i,t} + \beta_3 dE_{i,t+1} + \beta_4 dNa_{i,t} + \beta_5 dNa_{i,t+1} + \beta_6 Growth\ Opportunities_{i,t} \\ & + \beta_7 I_{i,t} + \beta_8 dI_{i,t} + \beta_9 dI_{i,t+1} + \beta_{10} D_{i,t} + \beta_{11} dD_{i,t} + \beta_{12} dD_{i,t+1} + \beta_{13} dV_{i,t+1} + \beta_{14} EXCash_{i,t} \\ & + \beta_{15} BIG4_{i,t} + \beta_{16} EXCash_{i,t} * BIG4_{i,t} + \beta_{18} GDP_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{10}$$

The coefficient on the interaction term (β_{16}) in Eq. 10 reflects the influence of perceived audit quality on the market value of excess cash. As Dittmar and Mahrt-Smith (2007), we estimate the new valuation regression for all firms with positive excess cash using firm fixed effects. Table 11 presents the results.

The results reported in Table 11 show that the coefficient on the interaction term $EXCash_{i,t} * BIG4_{i,t}$ is negative but insignificant, suggesting that high-quality audits do not necessarily lead to a significant increase in the market value of excess cash when the auditor is a Big 4 firm. Therefore, our findings do not indicate a significant Big 4 premium for the value investors place on a dollar of excess cash in Latin America.

5 Concluding remarks

In this paper, we examine the role played by perceived audit quality, captured by a Big 4 membership, on the value shareholders place on cash held by Latin American firms. Consistent with our predictions, we fail to find a positive and statistically significant association between audit quality and cash value in the Latin American context. Further analysis also shows that the market does not assign a significantly higher value to excess cash when a Big 4 auditor audits a Latin American company. Overall, our empirical results reveal that the value investors attach to a dollar of cash held by a Big 4 client does not differ significantly from the value they place on the cash assets of a non-Big 4 client.

Despite the empirical findings of Huang et al. (2019) that Big 4 clients in the U.S. receive a higher valuation on a dollar of cash compared to those audited by non-Big 4 firms, our regression analyses fail to indicate statistically significant evidence of a valuation premium regarding the value investors attach to cash holdings in Latin America when a company is audited by a Big 4 firm. Consequently, if investors do not perceive Big 4 auditors as effectively mitigating the potential value destruction associated with holding cash or enhancing the contribution of corporate cash holdings to firm value in the Latin American context, then our empirical results reveal that they do not assign a significant valuation premium to cash holdings of Big 4 clients compared to the same dollar of cash held by non-Big 4 clients.

Our empirical results should not be interpreted as suggesting that the audit quality of Big 4 auditors in Latin American countries is inferior to that in the United States. It is plausible that investors in Latin America perceive both Big 4 and non-Big 4 audits as being of similarly high quality, reflecting the regional context and governance structures. Additionally, the generally weaker governance mechanisms in these countries, compared to those in the United States, could influence investors' perceptions of audit quality. Thus, our findings should not imply that Big 4 audit quality in Latin America is inherently lower than in the U.S.; rather, investors in the region may have a distinct understanding of audit quality based on their local market conditions and regulatory frameworks.

Moreover, while our empirical findings do not reveal a significant valuation premium associated with the cash holdings of companies audited by Big 4 auditors in Latin America, several factors could influence firms' preference for Big 4 auditors in this context. Firstly, firms may select Big 4 auditors for reasons unrelated to audit quality. Big 4 firms often enjoy stronger brand reputations and extensive client networks, making them attractive choices for enterprises seeking prestige or broader market exposure. Secondly, audit firms in Latin America frequently offer non-audit services to their clients, a practice prohibited in the U.S. by the Sarbanes–Oxley Act of 2002. The ability of Big 4 auditors to provide a wider range of services, such as consulting and tax advisory, may enhance their appeal to Latin American firms.

Thirdly, industry norms and peer influence may play a significant role. When Big 4 firms audit leading companies within specific sectors or markets, other firms may follow suit to conform to perceived best practices and maintain competitive parity. This trend may reinforce the preference for Big 4 auditors within particular industries. These factors highlight the diverse considerations that influence firms in Latin America to choose Big 4 auditors, extending beyond audit quality alone.

However, it is important to note that, unlike the samples of U.S. publicly traded companies, where more than 90% of clients hire Big 4 auditors (Francis 2004), our sample comprises only 72.39% of companies audited by a Big 4 firm. This significantly lower prevalence of Big 4 auditors in Latin America compared to the North American context suggests that although they audit a substantial portion of publicly traded companies in Latin America, their overall dominance is markedly less. This factor must be considered when interpreting the results, as the differing market dynamics and regulatory environments may influence the comparative value of Big 4 audits across regions.

As a direction for future research, scholars could explore whether global disparities in Big-4 market penetration influence the association between auditor choice and the market value of cash, all else being equal. In jurisdictions where Big-4 auditors dominate, there may be a perception that their audits enhance credibility and reliability, potentially yielding a more substantial valuation premium for firms utilizing their services. Conversely, in regions with lower Big-4 market presence, differences in perceived audit quality between Big-4 and non-Big-4 auditors might be less distinct, leading to a diminished or negligible valuation premium for companies audited by Big-4 firms.

Future research could also investigate the underlying factors that lead to the higher valuation of future cash changes compared to contemporaneous cash changes, as observed in our study, which diverges from the findings of Pinkowitz et al. (2006). Comparative analyses across various market contexts, including both developed and emerging economies, could provide a more comprehensive understanding of these valuation dynamics.

Our paper is subject to some important caveats. First, in addition to the limited sample size, our research faces the limitations inherent to cross-country studies. Second, our results may not necessarily be generalized to all emerging markets. Third, we applied the Heckman

Table 11 The influence of audit quality on the market value of excess cash

Variables	Coefficient
Constant	0.486*** (3.964)
$E_{i,t}$	2.951*** (6.724)
$dE_{i,t}$	−0.630*** (−2.679)
$dE_{i,t+1}$	0.663*** (3.127)
$dNa_{i,t}$	−0.160** (−2.007)
$dNa_{i,t+1}$	0.155*** (3.288)
$GrowthOpportunities_{i,t}$	0.103** (2.337)
$I_{i,t}$	−1.244 (−1.440)
$dI_{i,t}$	0.310 (0.718)
$dI_{i,t+1}$	−0.431 (−0.913)
$D_{i,t}$	0.006*** (2.591)
$dD_{i,t}$	−0.003*** (−2.939)
$dD_{i,t+1}$	0.004 (0.426)
$dV_{i,t+1}$	0.263*** (4.513)
$EXCash_{i,t}$	0.031 (0.833)
$BIG4_{i,t}$	0.089 (0.926)
$EXCash_{i,t} * BIG4_{i,t}$	−0.007 (−0.178)
GDP	0.038*** (3.643)
Adjusted R^2	0.343
p-value	0.000
Year effects	Yes
Observations	1,821

Table reports firm fixed effects estimations of the market value of excess cash (Eq. 10). The dependent variable is the market value of the firm (Market-to-book), which is calculated at fiscal year-end as the sum of the market value of equity and the book values of short-term and long-term debt divided by the book value of assets; *E* is earnings before extraordinary (after depreciation and taxes); *NA* is net assets, that is, total assets minus cash and cash equivalents; *GrowthOpportunities* is the yearly growth rate of a firm's sales; *I* is interest expense; *D* is total dividends paid; *EXCash* is defined as the residual from Eq. 9; *BIG*4 is a dummy variable that takes the value 1 if the organization is audited by a Big 4 firm in each respective financial year and 0 otherwise; *GDP* was computed as the annual percentage

Table 11 (continued) growth rate of each country GDP; X_t is the level of variable X in year t scaled by total assets in year t; Robust standard errors are presented in parentheses. *, **, *** indicate significance levels of 10%, 5% and 1%, respectively

two-stage approach and the propensity score matching model to overcome self-selection bias. The former addresses selection bias due to unobservable client characteristics, and the latter addresses self-selection bias due to observable factors. However, Heckman's (1979) and PSM procedures do not eliminate selection bias. In this sense, selection bias cannot be entirely ruled out as an alternative explanation for our results.

Fourth, a firm's corporate governance system consists of multiple components. Considering that external auditing is a governance mechanism, it would be ideal to isolate the perceived audit quality effect from the effect of other governance mechanisms. We control for other governance mechanisms using (1) Management Score and (2) accounting conservatism. We recognize, however, that our inferences might be related to other governance mechanisms for which we do not have readily available proxies.

The existing literature has employed various measures to assess audit quality, including auditor industry specialization and financial restatements (DeFond and Zhang 2014). However, in the context of the present study, we have opted to use auditor size as the primary proxy for audit quality for two key reasons. First, the auditing literature suggests that the distinction between Big N and non-Big N firms is a well-established and widely accepted measure of audit quality, exhibiting high construct validity (DeFond and Zhang 2014). Second, the availability of data on alternative measures of audit quality, such as industry specialization and restatements, is limited in the Latin American setting. The lack of publicly accessible information on these other commonly employed proxies constrains our ability to incorporate them into this manuscript.

However, it is important to acknowledge that audit quality is a multifaceted construct that can be examined through various lenses (Francis 2023). Consequently, another limitation of the present study is that we have only utilized two measures of audit quality: the Big 4/non-Big 4 dichotomy and audit fees. As more comprehensive data becomes available in the Latin American context, future research may explore the influence of additional proxies of audit quality on the market value of cash. Nonetheless, we assert that, given the current unavailability of data on these alternative metrics, the Big 4/non-Big 4 dichotomy remains the most suitable proxy for evaluating audit quality in the Latin American setting at the time of this research.

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Declarations

Conflict of interest The authors have no conflicts of interest to declare.

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