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Empowerment or Ornament? Gender Diversity's Impact on Cash Holdings Amid Quota Enforcement in an Emerging Market

Running head: Empowerment or Ornament?

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Abstract

Purpose: This study examines the impact of female directors on cash holdings in Egyptian listed firms, particularly in light of Decree 123/2019, which mandates female board representation. It aims to determine if female directors mitigate agency conflicts related to cash holdings and how these dynamics shift post-quota implementation.

Design/methodology/approach: Utilizing a panel fixed-effects model, the research analyzes 1563 firm-year observations from 223 non-financial Egyptian firms listed on the EGX between 2014 and 2022. The robustness of the findings is tested through additional analyses using alternative proxies for cash holdings, different sample periods, and a two-stage least squares (2SLS) approach to address endogeneity concerns.

Findings: The study finds a significant negative association between female directors and cash holdings, suggesting that female board members may promote more conservative cash management practices. However, this relationship weakens post-quota implementation, becoming statistically insignificant. This implies that while quotas increase female representation, they do not necessarily enhance corporate governance effectiveness regarding cash management. The pre-quota positive link between female directors and excess cash holdings also becomes insignificant post-quota.

Originality/Value: This research provides empirical evidence from an emerging market context on the understudied impact of gender diversity on cash holdings. It critically evaluates the unintended consequences of mandatory gender quotas, highlighting the complexity of regulatory interventions in corporate governance. The study stresses the need for policymakers to address factors limiting the effectiveness of such quotas and to consider potential suboptimal outcomes when increasing female board representation without a corresponding increase in the supply of qualified female directors.

Research Limitations/Implications: The study focuses on female directors' impact on cash holdings, excluding potential effects on other board subcommittees or functions. It does not capture long-term benefits of increased female representation, which may emerge as the pool of qualified female directors grows. Future research should explore broader implications of gender diversity guidelines and other diversity dimensions across various corporate governance aspects and institutional contexts.

Keywords: Female directors; quota; cash holdings; corporate governance; Emerging Markets

1. Introduction

The conceptual frameworks of both the Financial Accounting Standards Board (FASB) and the International Financial Reporting Standards (IFRS) emphasize that assets are defined as present resources of an entity that can provide future economic benefits (Elamer and Utham, 2024; Khatib et al, 2021; Marie et al., 2024). Cash is a prime example of such a resource, given its liquidity and the role it plays in a firm's operations. It can be readily converted into other assets or used to achieve strategic objectives, such as funding operations or investments that promote growth. Cash holdings represent a crucial strategic resource for firms, influencing both operational flexibility and future growth potential. However, recent global trends indicate a significant increase in firms' cash hoarding (Amess et al., 2015; Banjade & Diltz, 2022; Khatib et al, 2021; Jilani et al., 2023). This trend raises concerns about potential agency conflicts, where managers might prioritize personal gain over optimal allocation of these excess cash reserves (Boubaker et al., 2015; Kim et al., 2015; Jensen, 1986). Consequently, effective corporate governance mechanisms are essential to mitigate such conflicts and ensure that cash holdings are managed in the best interests of shareholders.

In navigating these complexities, the composition of corporate boards, particularly the inclusion of female directors, has drawn scholarly attention (Elamer and Utham, 2024; Abdelkader et al., 2024; Ahmed et al., 2022; Boubaker et al., 2015; Chen & Hassan, 2022; Cimini, 2022). Emerging literature posits that female directors, with their distinct ethical sensitivity, risk aversion, and commitment to shareholder interests, could be instrumental in enhancing corporate governance and decision-making processes related to cash management (Datta et al., 2023; El-Dyasty & Elamer, 2021; Feng et al., 2020; McLaughlin et al., 2021; Shohaieb et al., 2022; Wan Ismail et al., 2022). Despite these insights, the empirical investigation of gender diversity's impact, especially within the ambit of enforced gender quotas in emerging markets, remains scant. Such contexts offer a fertile ground for exploring the nuanced dynamics of corporate governance, given their distinct regulatory environments and the recent shifts towards enhanced board diversity. This is particularly true in the context of emerging markets like Egypt, where research on cash holdings is limited.

Egypt offers a unique case study due to recent regulatory changes by the Financial Regulatory Authority (FRA). The introduction of Decree 123/2019 and its subsequent amendments underpin a national strategy aimed at bolstering female representation within the echelons of corporate boards. This legislative thrust towards gender quotas, aligning with broader societal objectives encapsulated in Egypt's Vision 2030 and the National Strategy for

Empowerment of Egyptian Women 2030. Decree 109/2021 further strengthened this policy, raising the quota to 25% or at least two female directors. These mandates offer a timely opportunity to examine the consequences of gender quotas in corporate governance.

Extant literature suggests female directors possess characteristics that could influence cash holdings, including heightened ethical sensitivity and risk aversion (Datta et al., 2023), stronger alignment with shareholder interests (Datta et al., 2021; Wan Ismail, 2022), and a tendency to reduce corporate debt and acquisitions (Xu et al., 2019). Additionally, they may have more power to avoid lawsuits (Adhikari et al., 2019) and strengthen corporate governance (Suherman et al., 2021). Research on this topic in developing countries remains limited (Nadia & Hanafi, 2022), making Egypt's recent board quota changes a unique case study. Specifically, changing the mosaic of boards in Egypt provides a unique opportunity to examine the effect of female directorship on cash holding practices.

To achieve our research objectives, we analyzed a sample of 223 non-financial Egyptian firms listed on the EGX, comprising 1563 firm-year observations from 2014 to 2022. We utilized two cash holding measures: the conventional measure (Fre´sard & Salva, 2010; Sah, 2021; Tosun et al., 2022) and the physical measure (Sah, 2023), with the latter excluding short-term investments. Our full sample analysis indicates a negative association between female board presence and both cash holding measures. This finding persists in the 2014-2019 period before the FRA's quota mandates. However, the association becomes insignificant after quota implementation. Similar patterns emerge when examining independent female directors. Notably, no significant association exists between executive female directors and cash holdings under either measure. Further analysis reveals a positive association between female directors and excess cash holdings before the quotas, which turns insignificant post-implementation. Our empirical analysis indicates a significant change in the association between female representation and cash holdings after the implementation of the Decree 123/2019 guidelines. Specifically, we find evidence consistent with the limited supply view. Compared to the pre-Decree 123/2019 period, the impact of female directors on cash holdings was significantly lower after the guideline introduction. This suggests that the increased demand for qualified female directors, without a commensurate increase in supply, may have led firms to appoint less qualified women to comply with the guidelines.

To test the robustness of our findings, we conducted a series of additional analyses. We re-examined our results using alternative proxies for cash holdings, including both physical cash holdings and excess cash holdings. The results remain consistent, supporting our primary findings. Second, we tested the sensitivity of our findings to different sample periods before

and after the guideline introduction. The negative impact of the Decree 123/2019 guidelines on the association between female directors and cash holdings remains robust across various subsamples. Third, we employed a two-stage least squares (2SLS) approach to address potential endogeneity concerns about the relationship between female board representation and cash holdings. Our main findings remain qualitatively unchanged after controlling for endogeneity. Furthermore, additional analysis reveals that the negative relationship between female directors and cash holdings is particularly pronounced for smaller firms, and in firms with lower leverage and audit quality. This suggests that female directors might be more influential in mitigating agency costs associated with cash holdings under certain firm conditions. These findings align with the notion that female directors tend to be more risk-averse and exhibit greater alignment with shareholder interests (Datta et al., 2023; Wan Ismail et al., 2022). Agency conflicts may be heightened in smaller firms due to reduced external oversight and in environments of weaker audit quality. The results imply that the recent quota mandates in Egypt might be more effective in reducing excess cash holdings for these specific subsets of firms.

This study makes several contributions to the literature. First, it expands the research on the association between female directorship and cash holdings by providing new evidence from the Egyptian emerging market. Second, and most importantly, it offers a timely analysis of the impact's recent female board representation quotas, examining their impact on cash holdings and excess cash holdings. As far we know, no previous study examine such association in Egypt. Third, the study specifically addresses the role of independent female directors in monitoring cash holdings. Finally, it provides empirical evidence on the determinants of cash holdings in the Egyptian context, using both conventional and physical measures.

These findings have both academic and policy implications. From an academic perspective, this study contributes to the literature examining gender diversity's impact on corporate governance, particularly within the context of gender diversity guidelines. It highlights that regulations can still lead to changes in board composition with potential unintended consequences for board effectiveness. Our results suggest that such guidelines need careful design and implementation to ensure they achieve their intended outcomes. For policymakers, our study reveals a potential unintended consequence of gender diversity guidelines. While designed to improve gender representation and board effectiveness, the results might indicate that, at least in the short-term, such measures could lead to less-qualified individuals being appointed to key board roles. Policymakers need to consider these potential

trade-offs when designing policies to promote gender diversity. We acknowledge some limitations of our study. First, while focusing on the female directors provide a well-defined context for analysis, it is important to note that gender diversity guidelines might have different impacts on other subcommittees or the overall board functions. Future research could expand the scope of investigation. Second, our analysis does not fully capture the potential long-term benefits of increased female representation, which might materialize as the supply of qualified female directors grows to meet demand.

The remainder of the paper proceeds as follows. Section 2 reviews relevant literature and develops the study's hypotheses. Section 3 outlines the research design, including data sources, variables, and methodology. Section 4 presents the empirical results and provides a detailed discussion. Finally, Section 5 offers contributions, limitations, and directions for future research.

2. Literature Review and Hypotheses Development

2.1 The Theoretical Framework

Firms hold cash for a complex mix of reasons, reflecting both operational necessities and potential conflicts. On the one hand, cash reserves are essential for facilitating daily operations, enabling strategic acquisitions, reducing dependence on costly external financing, covering dividend payouts and tax obligations, and providing flexibility in the face of uncertainty (Drobetz & Grüninger, 2007; Kim et al., 1998, 2015; Kuan et al., 2011; Opler et al., 1999; Sah, 2021). On the other hand, excessive cash holdings can exacerbate agency conflicts. Managers might misuse these reserves, prioritizing their interests over maximizing shareholder value (Gleason et al., 2017; Jensen, 1986; Khatib et al., 2021; Kuo et al., 2021; Lee & Lim, 2021; Moolchandani & Kar, 2022; Sun et al, 2023; Yang & Xue, 2023).

To understand the complex motivations behind cash holding decisions, prior research focuses on four main drivers. The transaction motive highlights the critical need for firms to maintain sufficient liquidity to cover the costs associated with daily operations and converting non-cash assets into usable funds when needed (Ozkan & Ozkan, 2004; Bates et al., 2009). The precautionary motive emphasizes building cash reserves as a buffer against unexpected downturns or sudden shocks, reducing dependence on costly external financing during such times (Sun et al., 2023; Ezeani et al., 2023; Ramachandran et al., 2022; Amess et al., 2015). However, the agency motive draws attention to the potential conflict of interest that arises from excessive cash holdings. Managers might be tempted to prioritize accumulating cash for

personal gain rather than maximizing shareholder value (Amess et al., 2015; Bates et al., 2009; Jensen, 1986). Finally, the tax motive offers a unique perspective for multinational corporations, where strategic cash holdings might be used to manage tax liabilities associated with repatriating foreign earnings (Abodoma, 2018; Bates et al., 2009).

Several theories offer frameworks for understanding the complex factors influencing corporate cash holdings. The trade-off theory emphasizes a dynamic balance between the costs and benefits of holding cash (Opler et al., 1999). It highlights the transaction and precautionary motives (Cambrea et al., 2022; Aftab et al., 2018; Lee and Powell, 2011), suggesting firms weigh these against the potential costs when determining their optimal cash level. Factors such as capital expenditures, firm size, leverage, dividend payments, risk, liquidity, and investment opportunities play a role within this theory (Abodoma, 2018; Al-Najjar & Belghitar, 2011). The pecking order theory, introduced by Myers (1984), prioritizes different sources of financing, establishing a hierarchy where firms prefer retained earnings, followed by debt, and lastly, equity issuance (Chaklader & Padmapriya, 2021). It positions cash as a buffer between retained earnings and the need for investment. However, a key distinction from the trade-off theory is that it doesn't focus on determining optimal levels of cash or debt (Bigelli & Sánchez-Vida, 2012; Ferreira & Vilela, 2004). Interestingly, the financial determinants considered by both theories often overlap (Abodoma, 2018; Al-Najjar & Belghitar, 2011). Finally, agency theory draws attention to the potential conflict of interest that arises from excessive cash holdings. It suggests that managers might be tempted to misuse these reserves for personal gain through empire-building or supporting unprofitable ventures, potentially leading to suboptimal cash levels (Kuo et al., 2022; Akhtar et al., 2018; Kim et al., 2015). This theory provides a lens to identify firms where agency conflicts might contribute to excess cash holdings (Opler et al., 1999).

The potential for agency conflicts related to cash motivates investigations into the role of corporate governance mechanisms in mitigating such issues. These mechanisms encompass aspects like board composition, capital structure (Ballester et al., 2020; Gillan, 2007), and the function of independent auditors (Fan and Wong, 2005; Cohen et al., 2002). Theoretically, weak corporate governance structures are often associated with higher levels of cash holdings (Griffin et al., 2010). However, empirical findings present a more complex picture. U.S. research shows inconsistent results, with some studies suggesting weaker governance might lead to lower cash holdings due to quicker spending (Harford et al., 2008), while others find larger cash reserves in such firms (Banjade and Diltz, 2022). Interestingly, a lack of significant association has also been reported within both the U.S. (Elyasiani and Movaghari, 2020) and

European contexts (Schauten et al., 2013). Findings from cross-country studies offer stronger evidence that effective corporate governance generally leads to lower cash holdings, particularly in regions like MENA (Al-Najjar and Clark, 2017) and Asia (Kusnadi, 2011). This suggests that a deeper exploration of different institutional and legal contexts is needed to fully understand the nuanced relationship between corporate governance and cash holdings.

Increased societal pressure and regulatory initiatives like quotas have put female board representation in the spotlight, aiming to strengthen corporate governance (Hamplová et al., 2022; Jebran et al., 2023; Mahran & Elamer, 2024; Rixom et al., 2023; Terjesen et al., 2015). Research examining the impact of female directors on cash holdings reveals two potential theoretical scenarios (Doan and Iskandar-Datta, 2020). Greater risk aversion and ethical standards in female directors might lower cash holdings and mitigate agency conflicts. Conversely, their risk-averse nature could also drive a precautionary approach, favoring larger cash reserves.

Empirical findings on this relationship offer no clear consensus and vary across regions. Within Europe, studies present contrasting results. Research from France, Spain, and Italy suggests female directors contribute to lower excess cash holdings, supporting the agency mitigation view (Bona-Sanchez et al., 2023; Cambrea et al., 2020; Ezeani et al., 2023; Jilani et al., 2023; Sarang et al., 2021). However, findings from UK, Greece and Italy align with the precautionary motive, showing a positive association (Elamer and Utham, 2024; Dimitropoulos and Koronios, 2021; La Rocca et al., 2019; Sarang et al., 2021). The picture remains complex with studies from the USA and Asia also offering opposing evidence. Some indicate that female directors mitigate agency-related cash concerns in the USA, China, and Malaysia (Atif et al., 2019; Guizani and Abdalkrim, 2022; Yang and Xue, 2023; UI Ain et al., 2021), while a Southeast Asian study indicates a positive association (Nadia and Hanafi, 2022).

2.2 Hypotheses Development

Prior research examining the impact of female directors on cash holdings in Egypt remains extremely limited. Consistent with agency theory, Abodoma (2018) found a negative association between female directors and cash holdings. While Abodoma (2018) established a negative association between female directors and overall cash holdings, there has been no exploration of their specific influence on excess cash holdings. This represents a significant knowledge gap, particularly given the recent policy changes in Egypt. The FRA's swift implementation of two consecutive female board representation quotas offers a unique and timely context to investigate how these mandates influence the relationship between female

directors and cash holdings practices. To address this gap, we propose the following hypotheses:

Hypothesis 1: Female directors are negatively associated with cash holdings in non-financial listed firms in Egypt.

RFA expects that increasing the number of females in the boardroom may improve corporate governance in Egyptian firms. Prior research reported mixed findings concerning the association between the number of female directors and cash holdings (e.g. Bona-Sanchez et al., 2023; Ezeani et al., 2023; Datta et al., 2023; Nadia and Hanafi, 2022; Amin et al., 2022; Tosun et al., 2022; Suherman et al., 2021; Cambrea et al., 2020). As no empirical evidence exists to support the expectation of RFA, the following hypothesis is formulated to test the association between female directors and cash holdings after the enforcement of female quotas.

Hypothesis 2: The negative association between female directors and cash holdings in non-financial listed firms in Egypt is strengthened after the enforcement of female quotas.

Within the broader context of board composition, research also explores the specific impact of independent and executive directors on cash holdings practices. Informed by agency theory, independent directors are expected to play a crucial monitoring role, incentivizing executives to align with shareholder interests and potentially reduce cash holdings (Bona-Sanchez et al., 2023; Cambrea et al., 2020; Atif et al., 2019). On the other hand, the precautionary motive suggests that executives, with their risk-averse nature, might favor holding larger cash reserves to ensure operational flexibility (Datta et al., 2023; Jilani et al., 2023; Sah et al., 2022; Sah, 2021; Suherman et al., 2021; Cambrea et al., 2020; Adhikari, 2017; Zeng and Wang, 2015). While most studies support the precautionary view, certain research found no significant association between executive female directors and cash holdings (Xu et al., 2019). To investigate the association between both independent and executive directors and cash holdings in Egypt, we hypothesize:

Hypothesis 3: Independent female directors are negatively associated with cash holdings in non-financial listed firms in Egypt.

Hypothesis 4: Executive female directors are positively associated with cash holdings in non-financial listed firms in Egypt.

3. Research Design

3.1 Sample Selection and Data Sources

This study examines a sample of 223 non-financial Egyptian firms listed on the EGX, spanning the years 2014-2022. This period was selected to ensure economic stability following the 2011-2014 revolution, yielding a total of 1563 firm-year observations. Data on financial statements and corporate governance mechanisms was manually collected from several sources. The EGX website provides official PDF versions of financial statements and other forms that include information related to corporate governance mechanisms. Since the financial statements' availability remains for a short time during trading sessions, the official websites of firms visited to download the official PDF versions. In addition, financial websites such as Mubasher and Naeem Brokerage provide financial statements and forms. Table 1 shows details of population and sample.

3.2 Measurement of Variables and Model Specification

This study employs a panel fixed-effects linear regression model (Ullah et al., 2022; Ullah et al., 2024a, 2024b) to examine the association between female directors and cash holdings in Egyptian listed firms. The basic model specification is provided below, where i denotes the firm and t denotes the year:

$$Cashholdings_{i,t} = \beta_0 + \beta_1 Female_{i,t} + \text{ʎ}\ Controls_{i,t} + Industry\_FE + Year\_FE + e_{i,t} \quad (1)$$

This study examines several key variables to investigate the relationship between female directors and cash holdings in Egyptian listed firms. Cash holdings are calculated using two measures (Sah, 2023): **CashMsec** (conventional) includes cash, equivalents, and market securities relative to total assets (Bona-Sanchez, 2023; Tosun et al., 2022; Sah, 2021; Adhikari, 2017; Fre´sard and Salva. 2010; Bates et al., 2009), while **PhysicalCash** (Physical Measure) focuses exclusively on cash and equivalents relative to total assets (Ezeani et al., 2023; Dimitropoulos and Koronios, 2021, Sarang et al., 2021; Sah, 2021; Cambrea et al., 2020; Ozkan and Ozkan, 2004). Female board representation is measured by **Female** (percentage of female directors), **BInFemale** (percentage of independent female directors), and **BFemaleExe** (percentage of executive female directors).

Consistent with prior research, corporate governance mechanisms and firm characteristics are used as control variables (e.g. Abdelfattah et al., 2021; Elamer et al., 2024; Marie et al., 2024; McLaughlin et al., 2021; Moubarak & Elamer, 2024; Jilani et al., 2023;

Bona-Sanchez et al., 2023; Wan Ismail et al., 2022; Tosun et al., 2022; Ul Ain et al., 2021; Cambrea et al., 2020; Abodoma, 2018). Other board characteristics include **BSize** (board size), **Duality** (CEO/Chair duality), and **BIndepend** (percentage of independent board members). Ownership structure is captured by **Manage_own** (managerial ownership percentage). The firm characteristics include **LnTAssets** (natural log of total assets), **LnAge** (natural log of firm age), **Inherent** (accounts receivable + inventory / total assets), **Capex** (capital expenditures / total assets), **NWC** (net working capital), **TobinsQ** (market value / total assets), **Div** (common dividends / total assets), **Leverage** (total liabilities / total assets), **ROA** (net income / total assets), and **Big4** (Big 4 auditor indicator). Table 2 displays variable definitions.

4. Empirical Results and Discussion

4.1 Descriptive Statistics and Bivariate Analyzes

Our analysis reveals several interesting trends in Egyptian listed firms. Table 3 indicates that, on average, firms hold 10.8% of assets in cash, equivalents, and market securities, with 8.6% specifically in cash and equivalents. Female representation on boards stands at 11.3%, with independent female directors comprising 9.6% and executive female directors holding 1.7% of board seats. Table 4 highlights a significant increase in female board representation following the implementation of FRA quotas. Initially, female directors represented 9.61% of board seats. This rose to 13.48% after the first quota and further increased to 19.33% following the second quota. Importantly, this growth is largely driven by an increase in independent female directors, from 7.84% pre-quota to 16.88% in 2022. Executive female representation remains relatively stable throughout. Additional insights from Table 3 include a prevalence of CEO/Chair duality (60%), a high average of independent board members (74.67%), and significant managerial ownership (51.37%). Interestingly, only 25% of the sampled firms are audited by Big 4 firms.

Insert Table 3

Table 3 shows the descriptive statistics for the variables. Egyptian firms hold 10.76 % of their assets in cash and cash equivalents and market securities. The firms keep 8.5% of their assets in cash and cash equivalents. The percentage of Female directors is 11.58%. While independent female directors represent 9.6%, executive female directors clench only 1.73% of board seats. Table 4 display the percentage of female directors before and after FRA passages of female quota in board of listed company. Table 4 displays the percentage of female directors

before and after FRA passages of female quota on boards of listed firms. In general, the percentage of females was 9.61% before quota enforcement. The percentage rose to 13.48 % after enforcing the first quota and reached 19.33% after the second quota. The increase in the percentage of female directors results from appointing more independent female directors. The percentage rose from 7.84% to 16.88 % in 2022. The percentage of executive female directors is relatively stable across time before and after quotas passage. Table 3 also show that 60 % of CEOs hold the position of Chairman of the board in the firms included in the sample. The percentage of independent members on boards is 70.6%. The average of managerial ownership is 51.4%. Big 4 audit firms only audit 24.6% of firms in the sample.

Insert Table 4

Table 5 reveals interesting relationships among the variables examined. While female board representation (both overall and independent) shows a negative correlation with cash holdings (conventional and physical measures), these associations are statistically insignificant. Interestingly, a significant negative association emerges between executive female directors and cash holdings under the conventional measure. Several board characteristics demonstrate significant correlations: board size, meetings, and CEO/Chair duality exhibit positive associations with cash holdings. Conversely, board independence and managerial ownership appear unrelated to cash holdings. Financial indicators present mixed findings. Firm size and complexity display positive, significant relationships with cash holdings, while inherent risk shows a negative, significant correlation. Firm age, capital expenditures, and market value seem unrelated to cash holdings. Conversely, dividends and return on assets correlate positively and significantly with cash holdings. Finally, leverage and Big 4 audit firms exhibit negative and significant associations with cash holdings.

Insert Table 5

4.2 Multivariate Regression Results

Table 6 provides compelling evidence on the relationship between female directors and cash holdings. Models 1 and 4, examining the full sample, establish a significant negative association between female directors and both conventional and physical cash holding measures. This supports H1 and aligns with prior findings in Egypt (Abodoma, 2018) and other contexts (Ezeani et al., 2023; Guizani and Abdalkrim, 2022). Interestingly, when analyzing the pre-quota period (2014-2019) in Models 2 and 5, the negative association between female directors and cash holdings remains significant. This suggests that female directors effectively mitigated agency issues related to cash holdings even before the quotas. However, a notable

shift occurs post-quota (2020-2022). Models 3 and 6 reveal that the association between female directors and cash holdings becomes insignificant. This finding contradicts H2 and offers a surprising insight: increased board representation might prompt a more cautious approach by female directors, aligning with the precautionary motive.

Insert Table 6

Table 6 also provides insights into the relationship between control variables and cash holdings. Board size and managerial ownership appear to have no significant impact on either conventional or physical cash holding measures. Conversely, board independence demonstrates a negative association with both measures, suggesting a potential role in mitigating excess cash holdings. Financial indicators present a complex picture. Firm size and age seem unrelated to cash holdings. However, inherent risk displays a strong negative correlation, indicating that firms with higher risk profiles might hold less cash. Net working capital shows an interesting contrast: a positive association under the conventional measure but a negative association under the physical measure, perhaps highlighting the complexities of short-term asset management. Market value exhibits a positive correlation with cash holdings, potentially suggesting that higher-valued firms maintain larger cash reserves. Dividends and return on assets also correlate positively with cash holdings, possibly reflecting the availability of funds for distribution or retention. Finally, leverage appears unrelated to cash holdings, while Big 4 auditors show a negative association, which might point to stricter monitoring in firms using such auditors.

Table 7 examines the association between independent female directors (BInFemale) and cash holdings. Consistent with H3 and prior research (Bona-Sanchez et al., 2023; Cambrea et al., 2020), a negative association emerges across the full sample and pre-quota period (2014-2019). This reinforces the notion that independent female directors might effectively reduce agency costs by maintaining lower cash reserves. However, mirroring the findings for overall female representation, the association becomes insignificant post-quota enforcement (2020-2022). This shift suggests that increased board presence might lead independent female directors to adopt a more cautious approach, potentially aligning with the precautionary motive.

Insert Table 7

Table 8 explores the relationship between executive female directors (BFemaleExe) and cash holdings. Interestingly, no significant association is found in the full sample analysis, contradicting H4 and studies suggesting a precautionary motive for executive directors (Datta

et al., 2023; Jilani et al., 2023). This finding aligns, however, with research conducted in China (Xu et al., 2019). Further investigation might be needed to understand the specific context-dependent factors influencing the behavior of executive female directors in Egypt.

Insert Table 8

Overall, the results highlight the nuanced roles of female directors in cash holdings. While independent female directors appear to prioritize agency mitigation, the impact of quotas requires further exploration. The inconclusive findings regarding executive female directors warrant additional research in the Egyptian context.

4.3 Additional Analysis

To gain further insights into the nuanced relationship between female directors and cash management, we employed an alternative approach: examining excess cash holdings. Both conventional (ExcessCashMsec) and physical (ExcessPhysicalCash) measures were used to provide a robust analysis. Excess cash was calculated using an established formula adopted in prior research (Jilani et al., 2023; Tosun et al., 2022). The residual value of the following equation represents the excess cash holdings:

$$Cashholdings_{i,t} = \beta_1 \ln(TAssets_{i,t}) + \beta_2 CF_{i,t} + \beta_3 NWC_{i,t} + \beta_4 MV_{i,t} + \beta_5 Capex_{i,t} + \beta_6 Levarage_{i,t} + \beta_7 Div_{i,t} + Industry\_FE + Year\_FE + e_{i,t} \quad (2)$$

where TAssets is total assets, and CF is operating income minus interest and taxes over total assets, and NWC is current assets minus current liabilities minus cash over total assets, and MV is the market value of the firm, equal the sum of the market value of equity plus the book value total debt divided by total assets. Capex is the capital expenditures over total assets, Leverage is total debt over total assets. Div refers to common dividend paid over total assets**.**

Table 9 displays the association between female directors and excess cash holdings. While the full sample shows no significant association between female directors and excess cash holdings, the pre-quota period reveals a positive association. This suggests that female directors might have initially favored holding larger cash reserves, potentially aligning with a precautionary motive. Intriguingly, this association disappears post-quota enforcement. This suggests that the quotas might have influenced a change in female directors' behavior. There are two likely interpretations. First, the increased representation on boards due to quotas might have diminished female directors' emphasis on building high cash reserves. Second, while a lessening focus on excess cash could indicate better alignment with shareholder interests, the absence of a clear negative association suggests that other factors are in play. Overall, these findings highlight the complex and potentially evolving motivations influencing female

directors' decisions regarding cash holdings in the Egyptian context. Further research is needed to fully understand these dynamics.

Insert Table 9

Table 10 offers a nuanced perspective on the relationship between female board representation and cash holding practices. It explores potential moderating effects of firm-specific characteristics that might shape the association between female directors and cash holdings. First, our analysis reveals an intriguing contrast based on firm size. Among large firms (Column 1), the negative association between female directors and cash holdings is statistically insignificant. However, in smaller firms (Column 2), this association becomes both stronger and statistically significant. This pattern suggests that female directors' ability to mitigate potential agency conflicts related to cash holdings might be more pronounced within smaller enterprises. These findings potentially align with arguments that smaller firms might benefit more from female directors' risk aversion and enhanced monitoring capabilities.

Insert Table 10

Second, the degree of firm leverage appears to influence the observed association. In high-leverage firms (Column 3), the negative association between female directors and cash holdings lacks statistical significance. Conversely, within low-leverage firms (Column 4), this association becomes significant. This result implies that female directors might be more effective in advocating for reduced cash holdings when the firm faces lower debt constraints, potentially reflecting risk-averse preferences in such contexts.

Third, audit quality also emerges as a potential moderating factor. In firms with low audit quality (Column 5), we observe a robust negative association between female directors and cash holdings. This finding emphasizes the possible compensatory governance role female directors might play – they enhance monitoring and alleviate agency concerns in contexts of weaker external auditing. However, in firms with high-quality audits (Column 6), the relationship loses significance, highlighting limitations of female directors' influence in environments with strong external monitoring.

Our results consistently indicate a negative association between board independence and cash holdings across various specifications. This reinforces the notion that independent directors may serve as effective monitors in mitigating excessive cash holdings. Furthermore, control variables, including firm size, Tobin's Q, dividends, leverage, ROA, inherent risk, capital expenditures, and Big 4 auditors, generally exhibit anticipated relationships with cash

holdings, lending support to theoretical expectations and prior empirical evidence. Overall, Table 10 provides compelling evidence that the impact of female directors on cash holdings is moderated by key firm characteristics. It points towards the need to consider a multifaceted perspective when examining their role within corporate governance mechanisms.

Table 11 presents the results from employing a Two-Stage Least Squares (2SLS) instrumental variable (IV) regression analysis to examine the effect of female board representation on cash holding measures, namely CashMseC and PhysicalCash. This methodological approach is designed to address potential endogeneity concerns, using Institutional Ownership (institue_own) and Government Ownership (Govern_Own) as instrumental variables. This choice of instruments is predicated on the premise that these ownership structures influence the selection of female directors while being exogenous to the firm's cash holding decisions, thus meeting the relevance and exogeneity requirements of valid instruments.

Insert Table 11

Results employing the 2SLS approach provide compelling evidence. In both models, the coefficient for the Female variable remains negative and statistically significant, even after addressing potential endogeneity. This reinforces the notion that female directors might play a causal role in mitigating excessive cash holdings, consistent with the agency theory perspective. The findings suggest that even with more robust methodology, the observed negative association between female directors and cash holdings persists.

5. Conclusion

Our investigation into the impact of female directorship on cash holdings in Egyptian listed firms offers nuanced insights into the complexities of implementing gender quotas within corporate governance frameworks. By analyzing 1,563 firm-year observations before and after the enforcement of gender diversity mandates, this study contributes to a deeper understanding of the interplay between board composition and financial management strategies in emerging markets.

Our findings challenge conventional wisdom regarding the efficacy of gender quotas in enhancing corporate governance. Specifically, we observe that the introduction of gender diversity mandates in Egypt did not uniformly strengthen the role of female directors in mitigating agency conflicts related to cash holdings. Instead, the impact of female directors on

cash management practices appears to be contingent on a range of factors, including the nature of their directorship (independent vs. executive) and the firm's compliance approach towards quota fulfillment. These insights extend the discourse on gender diversity and corporate governance by highlighting the limitations of quota systems in isolation and the necessity for a more nuanced understanding of gender dynamics within boards. Our analysis reveals a clear shift in female directors' behavior following the implementation of quotas. These findings resonate with research by Jilani et al. (2023) in France and Dimitropoulos & Koronios (2021) in Europe who observed a diminished influence of female directors after quotas were introduced. This could potentially be explained by the critical mass theory (Torchia et al., 2011). Perhaps the rapid increase in female directors due to the quota diluted their collective influence within the boardroom, hindering their ability to effectively address agency concerns or implement risk-mitigating strategies regarding cash holdings. The quota may have also led to the appointment of women who were not necessarily qualified for a board position, as suggested by Sultana et al. (2020). Such token appointments could further weaken the collective voice and impact of female directors. Additionally, pressure to meet the quota quickly might have led to prioritizing compliance over finding genuinely qualified candidates, potentially impacting the board's overall effectiveness.

This study makes several contributions to the literature on corporate governance and cash holdings in emerging markets. By examining the Egyptian context, it provides valuable insights into the evolving role of female directors and the impact of regulatory quotas on their influence within listed firms. Our findings suggest that quotas alone might not guarantee effective governance and can have unintended consequences. This study highlights the complex interplay between board dynamics, regulatory pressures, and governance outcomes. Theoretically, our work challenges assumptions about the automatic benefits of increased female board representation. Furthermore, it prompts further investigation into the optimal conditions for female directors to be effective agents mitigating agency conflicts regarding cash holdings.

For policymakers and corporate governance practitioners, our study underscores the importance of considering the qualifications and roles of female directors beyond mere numerical representation. The findings suggest that the effectiveness of gender quotas in improving corporate governance outcomes may be enhanced by complementary measures aimed at ensuring the substantive participation of female directors in board deliberations and decision-making processes. This may involve targeted initiatives to develop a pipeline of

qualified female candidates for board positions and mechanisms to foster their active engagement in governance roles.

This study is not without its limitations, which in turn open avenues for further inquiry. Our analysis focused primarily on quantitative data, and qualitative insights from interviews or board observations might further illuminate the motivations and experiences of female directors. Additionally, exploring the impact of quotas across different industries could reveal sector-specific variations. Several avenues for future research emerge from our findings. A deeper exploration of the internal dynamics and decision-making processes within boards post-quota implementation would be highly valuable. Additionally, comparative studies with other emerging markets could help identify factors moderating the impact of quotas. Lastly, investigating the longer-term effects of quotas on cash holdings and firm performance would provide a more comprehensive understanding of their implications.

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Tables

Table 1: Population and Sample

Year	Population	Financial firms	Non-financial firms	Full sample
2022	248	45	203	177
2021	246	44	202	173
2020	236	45	191	174
2019	247	46	201	182
2018	252	48	204	168
2017	254	46	208	161
2016	254	44	210	175
2015	252	43	209	181
2014	247	41	206	172
sum	2236	402	1834	1563

Table 2: Variable definitions

Variable	Definition
CashMsec	cash and cash equivalents and market securities over the total assets
PhysicalCash	cash and cash equivalents over total assets
Female	Percentage of female directors on board of directors
BInFemale	Percentage of independent female directors on board of directors
BFemaleExe	Percentage of executive female directors
BSize	Number of directors on the board of directors
Duality	A dummy variable equals 1 when the CEO also holds the position of the chairman of the board of directors, 0 otherwise
BIndepend	Percentage of independent members on board of directors
Manage_own	Percentage of managerial ownership in a firm
LnTAssets	Natural logarithm of total assets
LnAge	Natural logarithm of firm age
Inherent	(Accounts receivable + Inventory) / total assets
Capex	capital expenditures over total assets
NWC	current assets minus current liabilities minus cash over total assets
TobinsQ	market value of the firm, equal the sum of the market value of equity plus the book value total debt divided by total assets
Div	Common dividend over total assets
Leverage	Total liabilities divided by total assets
ROA	Net income / total assets
Big4	a dummy variable equal to 1 if a Big 4 audit firm exists, and 0 otherwise

Table 3: Descriptive Statistics

Variable	N	Mean	STD	Minimum	Maximum
CashMsec	1,563	0.108	0.151	-0.413	0.776
PhysicalCash	1,563	0.086	0.131	-0.413	0.709
Female	1,553	0.113	0.132	0.000	0.660
BInFemale	1,553	0.096	0.116	0.000	0.600
BFemaleExe	1,553	0.017	0.060	0.000	0.667
BSize	1,553	7.498	2.724	3.000	17.000
Duality	1,553	0.603	0.489	0.000	1.000
BIndepend	1,553	0.706	0.201	0.000	1.000
Manage_own	1,563	0.514	0.286	0.000	1.000
LnTAssets	1,563	20.012	1.931	13.226	25.388
LnAge	1,563	3.346	0.625	0.693	4.898
Inherent	1,563	0.431	0.262	0.001	1.471
Capex	1,563	0.030	0.106	-2.241	1.409
NWC	1,563	0.082	0.391	-3.290	8.056
MV	1,563	1.797	4.308	0.260	115.907
Div	1,562	0.029	0.057	0.000	0.630
Leverage	1,563	0.504	0.646	0.001	11.434
ROA	1,563	0.033	0.146	-1.441	0.660
Big4	1,563	0.246	0.431	0.000	1.000

Table 4: Percentage of female percentage across different period

Variable	Full Sample	Pre- Decree 123/2019	Post-Decree 123/2019 2020-2021	Decree 109/2021 2022
Female	0.116	0.096	0.135	0.193
BInFemale	0.096	0.078	0.111	0.169
BFemaleExe	0.017	0.018	0.018	0.014

Table 5: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) CashMseC	1.00																		
(2) PhysicalCash	0.87*	1.00																	
(3) Female	-0.02	-0.02	1.00																
(4) BInFemale	-0.01	-0.03	0.89*	1.00															
(5) BFemaleExe	-0.01	0.02	0.48*	0.03	1.00														
(6) BSize	0.11*	0.08*	0.01	0.07*	-0.13*	1.00													
(7) Duality	0.07*	0.08*	-0.02	-0.07*	0.11*	-0.07*	1.00												
(8) BIndepend	0.00	-0.04	-0.05	0.12*	-0.33*	0.42*	-0.21*	1.00											
(9) Manage_own	0.02	0.04	0.03	0.04	-0.02	0.24*	0.03	0.16*	1.00										
(10) LnTAssets	0.12*	0.05*	-0.12*	-0.04	-0.17*	0.50*	-0.13*	0.20*	0.20*	1.00									
(11) LnAge	0.04	0.02	-0.17*	-0.15*	-0.10*	0.16*	-0.02	0.11*	0.12*	0.37*	1.00								
(12) Inherent	-0.20*	-0.17*	-0.12*	-0.12*	-0.03	-0.14*	-0.03	-0.07*	0.03	-0.11*	0.03	1.00							
(13) Capex	0.02	0.03	0.04	0.02	0.04	-0.05*	0.01	-0.07*	0.00	0.03	-0.06*	-0.10*	1.00						
(14) NWC	0.03	-0.05	-0.02	-0.01	-0.02	0.00	0.01	0.05*	-0.07*	-0.09*	-0.13*	0.32*	-0.05*	1.00					
(15) TobinsQ	0.02	0.02	-0.03	-0.02	-0.02	-0.03	0.01	0.01	-0.03	-0.18*	-0.05*	-0.01	-0.02	-0.29*	1.00				
(16) Div	0.42*	0.38*	-0.02	-0.01	-0.03	0.19*	0.08*	0.02	0.10*	0.22*	0.12*	-0.11*	0.02	0.02	0.00	1.00			
(17) Leverage	-0.08*	-0.07*	-0.07*	-0.05*	-0.05	-0.05*	0.00	-0.05	0.06*	0.00	0.12*	0.16*	0.01	-0.40*	0.31*	-0.10*	1.00		
(18) ROA	0.28*	0.23*	0.03	0.03	0.01	0.13*	0.04	0.05	0.01	0.22*	0.00	-0.03	0.10*	0.34*	-0.27*	0.37*	-0.56*	1.00	
(19) Big4	-0.11*	-0.14*	-0.05*	-0.01	-0.10*	0.22*	-0.16*	0.14*	0.11*	0.39*	0.04	-0.01	0.02	-0.05	-0.03	0.01	0.01	0.06*	1.00

**** p<0.01, ** p<0.05, * p<0.1*

Table 6: The impact of female directors on cash holdings

Variables	(1) CashMseC Full Sample	(2) CashMseC Pre- Decree 123/2019	(3) CashMseC Post-Decree 123/2019	(4) PhysicalCash Full Sample	(5) PhysicalCash Pre- Decree 123/2019	(6) PhysicalCash Post-Decree 123/2019
Female	-0.066***	-0.062**	-0.056	-0.069***	-0.077***	-0.056
	(-2.72)	(-2.25)	(-0.95)	(-3.24)	(-3.03)	(-1.21)
BSize	0.001	-0.001	0.003	0.001	-0.000	0.003
	(0.88)	(-0.38)	(1.07)	(0.92)	(-0.18)	(1.19)
Duality	0.013*	0.008	0.023	0.009	0.009	0.007
	(1.93)	(0.95)	(1.61)	(1.55)	(1.31)	(0.57)
BIndepend	-0.041**	-0.051**	-0.019	-0.044***	-0.062***	0.002
	(-2.41)	(-2.56)	(-0.57)	(-2.84)	(-3.25)	(0.07)
Manage_own	0.019	0.017	0.019	0.028***	0.030**	0.033*
	(1.57)	(1.23)	(0.85)	(2.67)	(2.30)	(1.79)
LnTAssets	0.004	0.003	0.007	-0.000	-0.000	-0.001
	(1.59)	(1.03)	(1.55)	(-0.07)	(-0.00)	(-0.17)
TobinsQ	0.003***	0.002**	0.012***	0.001	0.001	0.003
	(2.93)	(2.14)	(2.75)	(1.01)	(1.15)	(0.92)
Div	0.658***	0.824***	0.470**	0.527***	0.639***	0.394***
	(5.74)	(7.33)	(2.51)	(5.80)	(6.45)	(2.77)
Leverage	0.005	-0.001	0.023*	-0.008*	-0.012***	-0.010
	(0.92)	(-0.18)	(1.85)	(-1.82)	(-2.66)	(-1.10)
ROA	0.197***	0.185***	0.256***	0.152***	0.151***	0.168***
	(5.99)	(5.26)	(4.12)	(5.80)	(5.12)	(3.28)
LnAge	-0.005	-0.002	-0.002	-0.004	-0.002	-0.010
	(-0.75)	(-0.32)	(-0.18)	(-0.85)	(-0.29)	(-1.02)
Inherent	-0.127***	-0.111***	-0.168***	-0.073***	-0.075***	-0.060***
	(-8.09)	(-6.63)	(-5.30)	(-5.68)	(-5.01)	(-2.62)
Capex	-0.028	-0.042	-0.006	-0.006	-0.001	-0.009
	(-1.02)	(-1.04)	(-0.15)	(-0.28)	(-0.02)	(-0.34)
NWC	0.031**	0.016	0.085***	-0.017	-0.010	-0.045***
	(2.01)	(1.42)	(2.97)	(-1.46)	(-0.95)	(-2.62)
Big4	-0.046***	-0.047***	-0.045***	-0.043***	-0.042***	-0.043***
	(-5.30)	(-4.50)	(-2.93)	(-5.76)	(-4.53)	(-3.54)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.063	0.094	-0.050	0.095**	0.112**	0.049
	(1.25)	(1.53)	(-0.57)	(2.03)	(1.97)	(0.58)
N	1416	908	508	1416	908	508
R^2	0.34	0.36	0.34	0.33	0.36	0.31
adj. R^2	0.32	0.34	0.30	0.31	0.33	0.26

Notes: This table reports regression coefficients and t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: The impact of independent female directors on cash holdings

Variables	(1) CashMseC Full Sample	(2) CashMseC Pre- Decree 123/2019	(3) CashMseC Post-Decree 123/2019	(4) PhysicalCash Full Sample	(5) PhysicalCash Pre- Decree 123/2019	(6) PhysicalCash Post-Decree 123/2019
BInFemale	-0.073***	-0.078**	-0.028	-0.080***	-0.106***	-0.026
	(-2.66)	(-2.48)	(-0.44)	(-3.42)	(-3.68)	(-0.53)
BSize	0.001	-0.001	0.003	0.001	-0.000	0.003
	(0.84)	(-0.40)	(1.08)	(0.88)	(-0.19)	(1.21)
Duality	0.013*	0.008	0.023	0.009	0.010	0.007
	(1.91)	(0.98)	(1.64)	(1.53)	(1.39)	(0.62)
BIndepend	-0.035**	-0.044**	-0.015	-0.037**	-0.052***	0.006
	(-2.03)	(-2.20)	(-0.44)	(-2.37)	(-2.74)	(0.21)
Manage_own	0.018	0.016	0.019	0.028***	0.029**	0.032*
	(1.52)	(1.19)	(0.83)	(2.63)	(2.28)	(1.77)
LnTAssets	0.005*	0.004	0.007	0.000	0.000	-0.000
	(1.68)	(1.11)	(1.62)	(0.04)	(0.09)	(-0.08)
TobinsQ	0.003***	0.002**	0.012***	0.001	0.001	0.003
	(2.95)	(2.15)	(2.72)	(1.03)	(1.15)	(0.90)
Div	0.662***	0.824***	0.476**	0.531***	0.638***	0.399***
	(5.77)	(7.34)	(2.53)	(5.83)	(6.47)	(2.80)
Leverage	0.006	-0.001	0.023*	-0.008*	-0.012***	-0.009
	(0.98)	(-0.13)	(1.88)	(-1.73)	(-2.61)	(-1.04)
ROA	0.196***	0.184***	0.254***	0.151***	0.150***	0.166***
	(5.95)	(5.23)	(4.10)	(5.75)	(5.11)	(3.25)
LnAge	-0.005	-0.003	-0.001	-0.005	-0.003	-0.009
	(-0.75)	(-0.39)	(-0.10)	(-0.89)	(-0.44)	(-0.93)
Inherent	-0.127***	-0.112***	-0.169***	-0.073***	-0.077***	-0.061***
	(-8.10)	(-6.67)	(-5.27)	(-5.75)	(-5.16)	(-2.61)
Capex	-0.029	-0.042	-0.006	-0.007	-0.001	-0.009
	(-1.04)	(-1.06)	(-0.15)	(-0.31)	(-0.02)	(-0.34)
NWC	0.032**	0.016	0.085***	-0.016	-0.009	-0.044**
	(2.01)	(1.43)	(2.98)	(-1.44)	(-0.90)	(-2.58)
Big4	-0.046***	-0.047***	-0.046***	-0.043***	-0.042***	-0.044***
	(-5.28)	(-4.48)	(-2.99)	(-5.72)	(-4.50)	(-3.60)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.052	0.086	-0.067	0.085*	0.104*	0.032
	(1.05)	(1.40)	(-0.75)	(1.81)	(1.84)	(0.37)
N	1552	1028	524	1552	1028	524
R^2	0.34	0.37	0.34	0.33	0.36	0.31
adj. R^2	0.33	0.35	0.30	0.31	0.34	0.26

Notes: This table reports regression coefficients and t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: The impact of executive female directors on cash holdings

Variables	(1) CashMseC	(2) PhysicalCash
BFemaleExe_Percentage	-0.032	-0.035
	(-0.53)	(-0.64)
BSize	0.001	0.001
	(0.77)	(0.80)
BMeet	0.013*	0.009
	(1.88)	(1.49)
Duality	-0.042**	-0.045***
	(-2.35)	(-2.74)
BIndepend	0.017	0.027**
	(1.42)	(2.50)
Manage_own	0.005*	0.000
	(1.81)	(0.21)
LnTAssets	0.003***	0.001
	(3.10)	(1.23)
TobinsQ	0.663***	0.532***
	(5.76)	(5.80)
Div	0.005	-0.008*
	(0.94)	(-1.78)
Leverage	0.195***	0.150***
	(5.93)	(5.72)
ROA	-0.003	-0.002
	(-0.44)	(-0.47)
LnAge	-0.124***	-0.070***
	(-8.05)	(-5.56)
Inherent	-0.030	-0.008
	(-1.07)	(-0.36)
Capex	0.031**	-0.017
	(2.03)	(-1.44)
NWC	-0.047***	-0.044***
	(-5.32)	(-5.76)
Big4	-0.032	-0.035
	(-0.53)	(-0.64)
Year	Yes	Yes
Industry	Yes	Yes
_cons	0.039	0.070
	(0.78)	(1.51)
N	1552	1552
R^2	0.34	0.33
adj. R^2	0.32	0.31

Notes: This table reports regression coefficients and t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: The impact of female directors on excess cash holdings

Variables	(1) ExcessMCashMsec Full Sample	(2) ExcessMCashMsec Pre- Decree 123/2019	(3) ExcessMCashMsec Post-Decree 123/2019	(4) ExcessPysicalCash Full Sample	(5) ExcessPysicalCash Pre- Decree 123/2019	(6) ExcessPysicalCash Post-Decree 123/2019
Female	0.287	0.688*	-0.331	0.404	0.799**	-0.337
	(0.81)	(1.77)	(-0.42)	(1.15)	(2.04)	(-0.43)
BSize	0.128***	0.125***	0.133***	0.133***	0.129***	0.129***
	(6.71)	(5.64)	(3.41)	(7.00)	(5.70)	(3.41)
Duality	0.190**	0.152	0.204	0.164*	0.117	0.169
	(2.03)	(1.27)	(1.25)	(1.76)	(0.98)	(1.07)
BIndepend	-0.226	-0.178	-0.414	-0.348	-0.308	-0.453
	(-0.88)	(-0.58)	(-0.89)	(-1.39)	(-1.00)	(-1.02)
Manage_own	-0.008	-0.037	0.013	0.301*	0.309	0.302
	(-0.05)	(-0.19)	(0.05)	(1.85)	(1.51)	(1.08)
LnTAssets	-0.035	-0.070*	0.039	-0.052	-0.077*	0.012
	(-1.05)	(-1.67)	(0.68)	(-1.55)	(-1.85)	(0.21)
TobinsQ	0.027***	0.026***	-0.017	0.018**	0.022**	-0.036
	(3.12)	(2.81)	(-0.30)	(2.23)	(2.39)	(-0.65)
Div	-1.262	-0.518	-1.858	-1.194	-0.136	-2.377*
	(-1.47)	(-0.48)	(-1.27)	(-1.42)	(-0.13)	(-1.77)
Leverage	0.037	0.006	0.180	-0.019	-0.081	0.055
	(0.50)	(0.06)	(1.24)	(-0.17)	(-0.55)	(0.39)
ROA	0.238	0.409	-0.731	0.201	0.264	-0.652
	(0.47)	(0.73)	(-0.78)	(0.39)	(0.45)	(-0.71)
LnAge	0.192**	0.236**	0.130	0.188**	0.250***	0.052
	(2.37)	(2.51)	(0.80)	(2.37)	(2.67)	(0.33)
Inherent	-0.498**	-0.362	-0.959**	-0.030	0.030	-0.199
	(-2.44)	(-1.46)	(-2.50)	(-0.14)	(0.11)	(-0.54)
Capex	0.148	0.620	-0.176	0.211	0.727	-0.215
	(0.44)	(0.87)	(-0.52)	(0.50)	(0.99)	(-0.50)
NWC	0.102	-0.054	0.719**	-0.023	-0.035	0.107
	(0.77)	(-0.48)	(2.54)	(-0.14)	(-0.17)	(0.42)
Big4	-0.555***	-0.500***	-0.693***	-0.508***	-0.447***	-0.677***
	(-4.89)	(-3.60)	(-3.21)	(-4.58)	(-3.29)	(-3.25)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	-0.530	-0.179	-1.434	-0.443	-0.278	-0.916
	(-0.80)	(-0.21)	(-1.26)	(-0.64)	(-0.32)	(-0.75)
N	1500	988	512	1493	985	508
R^2	0.06	0.07	0.10	0.06	0.08	0.09
adj. R^2	0.04	0.04	0.04	0.04	0.04	0.02

Notes: This table reports regression coefficients and t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Additional analysis

Variables	(1) CashMseC Large Firm	(2) CashMseC Small Firms	(3) CashMseC High leverage	(4) CashMseC Low leverage	(5) CashMseC Low audit quality	(6) CashMseC High audit quality
Female	-0.044	-0.088***	-0.021	-0.065**	-0.086***	-0.036
	(-0.94)	(-2.73)	(-0.56)	(-2.06)	(-2.75)	(-0.99)
BSize	0.001	0.002	-0.003	0.004*	-0.001	0.004*
	(0.30)	(0.61)	(-1.33)	(1.67)	(-0.34)	(1.77)
Duality	0.005	0.013	0.009	0.013	0.017**	0.007
	(0.61)	(1.25)	(1.12)	(1.21)	(1.98)	(0.58)
BIndepend	-0.078***	-0.009	-0.059***	-0.023	-0.054**	-0.011
	(-3.04)	(-0.38)	(-2.60)	(-0.85)	(-2.42)	(-0.43)
Manage_own	0.028	0.005	0.022	-0.005	0.043***	-0.019
	(1.50)	(0.29)	(1.58)	(-0.28)	(2.73)	(-0.91)
LnTAssets	-0.002	0.002	0.016***	-0.006	0.009***	-0.006
	(-0.34)	(0.32)	(4.76)	(-1.39)	(2.63)	(-1.24)
TobinsQ	-0.002	0.003***	0.002***	0.008*	0.003***	0.007*
	(-0.32)	(2.85)	(3.85)	(1.71)	(2.91)	(1.78)
Div	0.481***	0.688***	0.780***	0.609***	0.661***	0.572***
	(3.17)	(3.73)	(4.56)	(4.69)	(4.88)	(3.07)
Leverage	0.035*	0.002	-0.002	0.035	0.003	0.020
	(1.70)	(0.28)	(-0.33)	(0.59)	(0.48)	(0.99)
ROA	0.455***	0.117***	0.147***	0.292***	0.177***	0.312***
	(5.83)	(3.41)	(4.33)	(4.89)	(4.52)	(4.99)
LnAge	-0.013	0.003	-0.021**	0.019**	-0.013	0.007
	(-1.32)	(0.30)	(-2.37)	(2.32)	(-1.61)	(0.71)
Inherent	-0.145***	-0.144***	-0.101***	-0.252***	-0.135***	-0.113***
	(-5.57)	(-6.74)	(-5.43)	(-4.28)	(-6.55)	(-4.05)
Capex	-0.100*	0.008	-0.061	-0.008	-0.032	-0.085
	(-1.84)	(0.32)	(-1.57)	(-0.21)	(-1.14)	(-1.31)
NWC	0.003	0.075***	-0.009	0.193***	0.039*	0.005
	(0.35)	(3.61)	(-0.84)	(2.94)	(1.69)	(0.21)
Big4	-0.061***	-0.028	-0.033***	-0.063***	-0.046***	-0.052***
	(-5.84)	(-1.53)	(-3.02)	(-4.59)	(-4.24)	(-3.49)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.264**	0.068	-0.156**	0.219***	0.015	0.209***
	(2.00)	(0.66)	(-2.26)	(2.72)	(0.24)	(2.63)
N	764	788	773	779	1038	514
R^2	0.47	0.23	0.34	0.44	0.39	0.27
adj. R^2	0.45	0.19	0.31	0.41	0.36	0.23

Notes: This table reports regression coefficients and t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: IV 2SLS

Variables	(1) Female	(2) CashMseC	(3) PhysicalCash
Govern_Own	-0.001		
	(-0.05)		
institue_own	-0.055***		
	(-4.04)		
Female		-0.732**	-0.536**
		(-2.51)	(-2.19)
BSize	0.005***	0.005**	0.004**
	(3.01)	(2.08)	(2.23)
Duality	-0.016**	-0.007	-0.003
	(-2.22)	(-0.70)	(-0.38)
BIndepend	-0.040**	-0.058**	-0.054**
	(-2.18)	(-2.21)	(-2.46)
Manage_own	0.057***	0.025	0.031**
	(4.17)	(1.45)	(2.11)
LnTAssets	-0.007***	-0.002	-0.007*
	(-2.79)	(-0.61)	(-1.93)
TobinsQ	-0.001	0.001	-0.000
	(-1.63)	(1.12)	(-0.15)
Div	-0.057	0.816***	0.687***
	(-0.87)	(9.94)	(9.96)
Leverage	-0.001	0.023***	0.010
	(-0.18)	(2.76)	(1.47)
ROA	0.044	0.235***	0.181***
	(1.43)	(5.75)	(5.28)
LnAge	-0.022***	-0.023**	-0.018**
	(-3.57)	(-2.07)	(-1.97)
Inherent	-0.052***	-0.151***	-0.091***
	(-3.67)	(-6.33)	(-4.54)
Capex	0.025	-0.017	0.007
	(0.81)	(-0.43)	(0.20)
NWC	-0.013	0.022	-0.025**
	(-1.27)	(1.62)	(-2.21)
Big4	-0.005	-0.057***	-0.049***
	(-0.58)	(-5.37)	(-5.49)
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
_cons	0.351***	0.345**	0.352***
	(7.44)	(2.57)	(3.13)
N	1552	1552	1552