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Corporate Governance and Cash Holdings among Non-Financial Companies Listed in the Nigerian Exchange Group

Agbonrha-Oghoye Imas Iyoha[1*], Victor Chukwudeme Odu[2], Okuns Omokhudu[3]
[1]*Department of Accounting, Faculty of Management and Social Sciences, Edo State University Uzairue, Iyamho, Nigeria*
[2.3.] *Department of Accounting, Faculty of Management Sciences, University of Benin, Benin City, Nigeria*
*Corresponding author: iyoha.agbonrha@edouniversity.edu.ng
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ABSTRACT

The exogenous shocks that necessitate firm deviation from a target cash holding vary across firms and institutional environments, hence the need for the study. This study examines the relationship between corporate governance (CG) and cash holdings among non-financial companies in the Nigerian Exchange Group between 2011 and 2020. The number of populations is 133 non-financial firms. As not all firms disclosed publicly comprehensive annual reports the number of final samples is 88 firms. Generalized Method of Moments (GMM) and the quantile techniques were adopted. With a speed of adjustment (SOA) of 0.75 and a time frame of one year, three months, and four days (1/0.749 = 1.34), the result reveals a partial dynamic adjustment to target cash holdings. The quantile estimation generally reveals low cash holdings and high SOA dynamics, and it is significant at 5% level. With exception of board gender diversity and institutional ownership, variables such as board independence, size, and chief executive officer equity ownership exhibit a significant inverse impact on cash holdings at a 5% level. Relying on the dynamic trade-off and agency theories, the results conform to a prior expectation. This study recommends that a manager should formulate strategic financial policy based on a firm's specific SOA.

Tata Kelola Perusahaan dan Kepemilikan Kas di antara Perusahaan Non-Keuangan yang terdaftar di Nigerian Exchange Group

ABSTRAK

Tujuan penelitian ini adalah untuk menguji hubungan antara tata kelola perusahaan dan kepemilikan kas di antara perusahaan-perusahaan non-keuangan di Nigerian Exchange Group pada tahun 2011 s.d. 2020. Populasi penelitian ini berjumlah 133 perusahaan sedangkan jumalh sampel hanya 88 perusahaan karena tidak semua perusahaan dapat diakses laporan tahunannya secara lengkap. Penelitian ini menggunakan model dinamis dengan menggunakan Generalized Method of Moments (GMM) dan teknik estimasi kuantil. Dengan SOA sebesar 0,75 dan jangka waktu satu tahun, tiga bulan, dan empat hari (1/0,749 = 1,34), hasil penelitian menunjukkan adanya penyesuaian dinamis parsial terhadap target kepemilikan kas. Estimasi kuantil secara umum menunjukkan kepemilikan kas yang rendah dan dinamika SOA yang tinggi, dan signifikan pada tingkat 5%. Dengan pengecualian keragaman gender dewan dan kepemilikan institusional, variabel-variabel seperti independensi dewan, ukuran, dan kepemilikan ekuitas CEO menunjukkan dampak negatif yang signifikan terhadap kepemilikan kas pada tingkat 5%. Berdasarkan teori trade-off dinamis dan teori keagenan, hasil penelitian ini sesuai dengan ekspektasi sebelumnya. Makalah ini merekomendasikan bahwa seorang manajer harus merumuskan kebijakan keuangan strategis berdasarkan SOA spesifik perusahaan.

1. Introduction

Revenue is vanity, cash flow is sanity, but cash is king because businesses can survive, at least in the short run, with the availability of cash at their disposal, even when operating at a loss. The liquidity of corporate entities is paramount because it enables them to meet their financial obligations, curtail future financial uncertainty due to cash flow volatility, and take advantage of profitable future investments. However, the free cash flow hypothesis by Jensen (1986) and Stulz (1990) states that shareholders will choose to limit managers' access to free cash flow in order to mitigate agency conflict over its deployment. This led to a trade-off between providing a sufficient cash level for managers to efficiently fund all good projects and the motive to hoard cash, which could be misappropriated.

Cash holdings have a distinct tendency to respond to time. In a frictionless market, an observable phenomenon is at its optimum, but this is inconsistent with reality as no institutional environment is perfect. Therefore, it is likely that a certain phenomenon does not respond immediately to changes but rather that time passes before such changes are recognized. This is categorized as "dynamic behavior," which is induced by anticipation. Such anticipation depends on past events. With market imperfection, a deviation from a target level must be rebalanced, considering the cost of such a deviation and the cost and benefit of the adjustment process.

According to the dynamic trade-off theory by Fischer et al. (1989), a firm would rebalance to a target if it maximized its value. On the contrary, a static model implies that the phenomenon under consideration is already at its target, which is unlikely because no market is perfect. Empirical evidence unanimously supports the dynamic adjustment to target cash holdings. However, the exogenous shocks that necessitate firm deviation from target cash holdings vary across firms and the institutional environment. Consequently, considering the differences in the institutional environment, macroeconomic indicators, provisions and implementation of corporate governance (CG) codes, and firm-specific attributes, it becomes unlikely for the speed of adjustment (SOA) and the time it will take to achieve target cash holdings to be the same. For example, Anand et al. (2018) discovered 0.6 SOA for firms in India; Orlova and Rao (2017) discovered 0.54 SOA for firms in the US; and Ogundipe et al. (2012) discovered 0.89 SOA for firms in Nigeria.

Considering the high asymmetry of information that characterizes most developing economies, such as Nigeria, investigating CG indicators on firm cash holdings is germane. This is because, according to the agency theory, without a control threat, it is impossible to convince self-interested managers to hold a desirable cash level. The board of directors (BoDs) is the most influential decision-making unit of an organization. It supervises, monitors, and controls managerial actions and implements key financial and strategic decisions (Ferreira, 2010). In the same vein, Bhagat and Black (2017) opined that a company's board structure affects its bottom line, and one such area is holding a desired cash level to maximize shareholders' wealth. A well-composed board of directors plays an enormous role in ensuring that CG practices are entrenched.

As a link between stakeholders and the company, the board is to exercise oversight and control to ensure that management acts in the best interest of shareholders and other stakeholders while sustaining the prosperity of the company. According to Ongore et al. (2015), the composition of a board includes the number of directors, the proportion of independent directors, the board's demographics, its education, the frequency of meetings and assessments, its leadership make-up, and the presence or absence of other significant qualities such as gender diversity. The Nigerian Code of CG issued by the Financial Reporting Council of Nigeria ([FRCN], 2018) posits that the BoDs should be composed in such a way as to have: (i) an appropriate mix of knowledge, skills, and experience, including the business, commercial, and industry experience needed to govern the company; (ii) an appropriate

mix of executive, non-executive, and independent non-executive members such that the majority of the board are non-executive directors. It is desirable that most of the non-executive directors are independent; (iii) there is a need for a sufficient number of members that qualify to serve on the committees of the board; (iv) there is a need to secure a quorum at meetings; and (v) there are diversity targets relating to the composition of the board. It is believed that this will lead to better board oversight and, therefore, prevent agency crises on asset deployment. Also, the code gives credence to institutional shareholders' roles when it states that the board should encourage institutional investors to positively influence the standard of CG and promote value creation in the company. It is also to monitor conformance with the provisions of the code and raise concerns as appropriate.

Therefore, whether management is demanding more or less liquidity for transactions or as a precautionary and speculative motive for holding cash (Keynes, 1936), CG oversees the ratification of such initiatives through the board structure. Again, where there is suspicion of managerial opportunism using excess cash flow, it is the duty of CG to address such an issue and prevent an agency crisis. According to Jensen (1986), agency problems within a firm are usually related to free cash flow and asymmetric information problems. Nigeria's CG model is characterized by widely held equity ownership, which frequently leads to agency crises. Thus, testing CG mechanisms such as board independence, board size, Chief Executive Officer (CEO) equity ownership, board gender diversity, and institutional ownership for constraining free cash flow, which could lead to agency crises, and modeling the dynamic adjustment process of cash holdings in the context of agency problems among non-financial listed firms in Nigeria becomes necessary.

The inconsistent SOA as found in previous studies, as well as the need to model cash holdings from a dynamic panel perspective in a developing economy such as Nigeria, constitute an important step towards a more realistic test of cash holdings behavior using a data set of non-financial companies listed in the Nigerian Exchange Group (NGX). This study differs from studies done in other developing economies, such as Pakistan. For example, the studies of Mashood and Shah (2014) and Basheer (2014) did not take into account modeling the dynamic adjustment of cash holdings, resulting in the incorrect assumption that the cash holdings of Pakistani firms are already at their maximum.

The results show that the quantile estimation generally reveals low cash holdings and high SOA dynamics, and it is significant at 5% level. Further, the Generalized Method of Moments (GMM) reveals that board independence, size, and CEO equity ownership exhibit an inversely significant impact on cash holdings at a 5% level, while board gender diversity and institutional ownership have an inversely insignificant impact. The study presents some novelty, unlike counterparts from developed economies. First, employing quantile estimation, the study probes further into examining the distributional dynamics in the SOA of firms towards optimal cash holding decisions.

The usefulness of the quantile regression technique is that unlike panel regression, which does not show the effect of an independent variable on different levels of the dependent but is regarded as a mean regression, the quantile regression parameter estimates the change in a specified quantile of the response variable. The conditional quantile regression traces the entire distribution of the independent variable, conditional on a set of categories for the dependent variable. The quantile estimates are generated for different ranges of cash holding structure that allow the study to examine the impact of CG at different points of the distribution of the firm’s cash holdings. Second, the use of the GMM in addressing the issue of endogeneity would give a deeper insight into developing countries, unlike counterpart studies that employ a static approach to modeling cash holding behavior. Finally, the study contributes to knowledge by examining the dynamic adjustment process to target

cash holdings of non-financial firms listed in NGX, an area of research that has largely been ignored in developing economies such as Nigeria.

The next section discussed related prior literature and the hypotheses development, the methodology of the study, the discussion of the research findings, and the conclusion and policy implications of the study.

2. Literature review and hypothesis development

Cash holdings exhibit a distinct peculiarity in responding to the time factor. For instance, in a frictionless market, an observable phenomenon is at its optimum. However, this is inconsistent with reality, as no institutional environment is perfect. Therefore, it is likely that a certain phenomenon does not respond instantly to changes; rather, time goes by before such changes are recognized. In finance literature, this has been classified as dynamic behavior that is induced by anticipation.

Suffice to say that such anticipation will depend on past events; therefore, a current observable phenomenon has to build on past events. This results in dynamic modeling, where past events are taken into consideration to account for the present observable event. Given that there is market imperfection, a deviation from a target level must be rebalanced, taking into consideration the cost of such a deviation and the cost and benefits of the adjustment process. According to the dynamic trade-off theory by Fischer et al. (1989), a firm would rebalance to the target if it maximized its value. On the contrary, static modeling implies that the phenomenon under consideration is already at its target. This is unlikely because no market is perfect.

Areas where such dynamic modeling has been mainly applied in finance literature include dividend policy decisions and capital structure decisions, such as in the study of Iyoha et al. (2022). However, an attempt to separate cash holding decisions from the dynamic approach would be satirical because, with market imperfection, the present observable cash level is a function of the previous year's cash level. Therefore, in applying the dynamic trade-off theory to cash holding decisions, a firm would hold cash at a level that maximizes the firm's value. This implies a trade-off between the cost and benefit of the adjustment process. When the benefit of adjustment is greater than the cost, firms will want to quickly adjust. Also, when the cost of deviation is significant and non-persistent over time, firms would also want to quickly adjust to the moving target. This view is in line with Ozkan and Ozkan (2004), who conclude that there exists an unobservable target cash holding that firms would want to achieve. However, due to exogenous shocks such as market imperfections, firms often deviate from such targets and would want to quickly rebalance.

Empirical studies on dynamic adjustment to target cash holdings have unanimously provided evidence for significant adjustment to a target cash holding level. However, the SOA varies. For example, Anand et al. (2018) discovered 0.6 SOA for firms in India; Orlova and Rao (2017) discovered 0.54 SOA for firms in the US; and Ogundipe et al. (2012) discovered 0.89 SOA for firms in Nigeria. A high SOA shows that firms can swiftly adjust to target cash holdings within a short time frame because the associated cost of adjustment is low. Therefore, firms do not need to accumulate a high cash reserve. This implies that there are favorable macroeconomic indicators, such as a developed money market.

Also, healthy banking relationships have implications for high SOA. Banks do exhibit strong credit administration policies. Their ability to adequately collect and process information about a borrower makes information asymmetry almost impossible. Therefore, they are seen as effective monitoring agents. Ozkan and Ozkan (2004) posit that for high SOA, the cost of deviation from the target is significant and non-persistent over time. Also, the high SOA implies that firm-specific characteristics such as default risk, bankruptcy cost, and growth rate are high. On the contrary, low SOA indicates that firms will slowly move toward target cash holdings over a long period of time. This

implies that adjustment costs are high and that macroeconomic factors such as money and other financial institutions' markets are weak. Again, firm-specific peculiarities such as high default risk, the likelihood of being bankrupt, higher opportunity costs of deviating from the target, firm growth rate, and the extent to which firms are leveraged could account for differences in achieving their respective SOAs to target cash holdings (Byoun, 2008). This implies that SOAs are likely to be heterogeneous across firms. Consequently, financial managers need to understand the distinct peculiarities of their respective firms in order to make relevant financial policies. Hence, the hypothesis is stated as follows:
H_1: There is evidence of a partial dynamic adjustment to the target cash holdings of non-financial firms listed on the NGX.

The Nigerian Code of CG by the FRCN (2018) opined that the BoDs should have an appropriate mix of executive, non-executive, and independent non-executive directors. It is desirable that most of the non-executive directors be independent. Board independence refers to a corporate board with a majority of independent non-executive directors (Akpan & Amran, 2014). This is important because it reduces the discretion and opportunistic tendencies of managers. In the area of control, it is believed that boards dominated by independent non-executive directors are presumed to carry out the monitoring function on behalf of shareholders to provide effective oversight on managers that maximize shareholders' interests (John & Senbet, 1998). This suggests that an independent board provides better shareholder protection, so that the agency cost of holding cash is reduced. On the contrary, Hermalin and Weisbach (2003) observe that a corporate board with a high proportion of independent directors does not always lead to better organizational performance. From the entrenchment perspective, independent board members are capable of becoming entrenched; therefore, inefficiency results in the unchecked deployment of corporate assets or transactions (Morck et al. 1988). The mixed relationship between board independence and cash holdings can also be explained in the context of agency theory. For instance, the agency framework sees managers having the inclination to appropriate firm resources by embarking on investments with unfavorable net present value in order to satisfy management preferences and enable them to gain discretionary power (Myers & Rajan, 1998). One of such ways of appropriating firm resources for their private gains is to hold liquid assets such as cash in excess of what is required, which can be converted into private benefits. With an independent board, managers' discretionary power will be reduced, and vice versa.

Prior studies have found a mixed relationship between board independence and cash holdings. A particular line of study found a positive relationship (Hannan & Asghar, 2013), while another found an inverse relationship (Safdar, 2017). Also, some studies found significant impact (Safdar, 2017; Sheikh & Khan, 2015), while others found insignificant impact (Anabestani & Shourvarzi, 2014; Wong & Yang, 2013). In the Nigerian context, the provisions of the CG Code on board independence have enjoyed wide acceptance.

In line with the argument that an independent board provides better shareholder protection and that the agency cost of holding cash is reduced, this study seeks to examine whether board independence limits managers' access to free cash flow in order to mitigate agency conflict over its deployment. Hence, the hypothesis is stated as follows:
H_2: There is a significant inverse association between board independence and cash holdings of non-financial firms listed on the NGX.

Board size refers to the number of directors on the board. The optimal number of directors on the board is still subject to controversy. Dedman (2000), in a study conducted in the United Kingdom (UK), opines about eight members on the board, while Yermack (1996), in a study conducted in the United States of America (USA), recommends twelve members on the board. However, the contentious

issue is that there is no threshold for what constitutes small and large board sizes. In the Nigerian context, the Nigerian code of CG issued by FRCN (2018) does not specify a fixed number of BoDs; rather, it states that the board should be of sufficient size to effectively undertake and fulfill its business, to oversee, monitor, direct, and control the company's activities, and be relative to the scale and complexity of its operations. Proponents of a small board size opined that it contributes more to the success of the organization through prompt and precise decision-making (Yermack, 1996). Proponents of a large board size opined that it enables the corporate board to have access to relevant information that could improve the board's effectiveness.

A positive association between board size and cash holdings could be that when the board size is small, there is a tendency for board members to be manipulated (Defond & Jiambalvo, 1994). Also, larger boards have an aversive attitude towards monitoring, which increases the likelihood of CEO entrenchment and consequently more cash holdings by firms (Hermalin & Weisbach, 2003). On the contrary, Zahra and Pearce (1989) opined that as the board becomes larger, the CEO can obtain quality advice from outside independent directors who are able to provide more expertise than other executives. Prior studies have found a mixed relationship between board size and cash holdings. A particular line of study found a positive relationship (Rehman & Wang, 2015), while another found an inverse relationship (Lingesiya, 2017). Also, some found significant impact (Rehman & Wang, 2015), while others found insignificant impact (Khan & Tanveer, 2016; Lingesiya, 2017). Given that the average board size of 8 members as found in the Nigerian context is small and in line with the argument that small board sizes contribute more to the success of the organization through prompt and precise decision-making, this study seeks to examine whether a small board size in the Nigerian context can limit managers' access to free cash flow in order to mitigate agency conflict over its deployment. Hence, the hypothesis is stated as follows:

H_3: There is a significant inverse association between board size and cash holdings of non-financial firms listed on the NGX.

The CEO is the head of the executive management team of any organization and pilots its affairs. He is also a member of the BoDs. According to Barclift (2011), CEOs are seen as the fulcrum of CG. Johnson and Yi (2015) posit that an influential CEO can manipulate the CG mechanism that imposes constraints on its actions through managerial powers. A dominant CEO is perceived as one who has power and influence over a firm, its management, and possibly the board (Park et al., 2015). A CEO's power is shown in his ability to exert his will and fortify his position relative to the board. CEO dominance or influence can arise due to equity share ownership, which could either lead to convergence of interest or managerial entrenchment. For instance, managers are thought to be entrenched when they have a large equity stake in the company (Morck et al., 1988; Ozkan & Ozkan, 2004). A CEO with significant shareholdings will have more influence than a CEO with little or no equity ownership interest. Consequently, this reduces board influence, thereby enhancing CEOs' opportunistic tendencies to act in their own self-interest. Firms managed by dominant CEOs prefer retaining cash flows for potential investment opportunities (Deshmukh et al., 2010). This can have consequences for the company, such as the misappropriation of assets, particularly liquid assets.

Prior studies have found a mixed relationship between CEO equity ownership and cash holdings. A particular line of study found a positive relationship (Azinfar & Shiraseb, 2015; Do, 2018), while others found inverse relationships (Ikueze & Egungwu, 2017; Lingesiya, 2017; Ozkan & Ozkan, 2004). Also, some found significant impact (Ikueze & Egungwu, 2017; Lingesiya, 2017), while others found insignificant impact (Ozkan & Ozkan, 2004). The explanation for the positive relationship is that the more a CEO is entrenched, the greater his power within the company. CEOs who have served a

relatively long tenure have a greater ability to accumulate cash. Also, the positive association could imply that when shareholders' interests are well protected, they are more confident in allowing corporate entities to have more cash reserves, which allows firms to take advantage of potential investment opportunities, especially for small companies. On the contrary, one possible explanation for the inverse relationship with cash holdings is that equity compensation could be used by shareholders to achieve small cash holdings in order to forestall value-destroying decisions by managers. However, beyond a certain threshold, managers will become so powerful and dominant that it could lead to a stockpiling of cash. In the Nigerian context, the Nigerian Code of CG makes a pronouncement to forestall dominance in BoDs when it opines that ‘’no individual or small group of individuals should dominate the board’s decision-making.’ Therefore, one would expect that the CEOs are not that influential to override the board. This study seeks to examine whether CEO equity ownership in the Nigerian context can limit managers' access to free cash flow in order to mitigate agency conflict over its deployment. Hence, the hypothesis is stated as follows:

H_4: There is a significant inverse association between CEO equity ownership and cash holdings of non-financial firms listed on the NGX.

Board gender diversity refers to the ratio of female to male directors on the board. Due to the resources such as prestige, skills, knowledge, and external linkage women possess, they are often appointed to corporate boards (Dang & Vo, 2012). Loukil and Yousfi (2016) opine that female directors seldom make risky and challenging investments, which could inversely impact a firm’s performance. On the contrary, female directors on the board are risk-averse and less confident in their decision-making (Dowling & Aribi, 2013). Women’s participation on the board does not bring about effective board activities because they are less confident and, in times of competitive business environments or challenges, may not be able to take quick decisions.

Specifically, Smith et al. (2006) opine that in a challenging and more competitive business environment, board diversity may face more conflict, probably because of the averse-risk nature of female directors, which could slow down the pace of the decision-making process and affect the ability of the firm to respond to the market due to the absence of a timely decision. Consequently, the risk-averse and less confident nature of female directors on the board could make a firm hold more cash (Loukil & Yousfi, 2016). However, Byrnes et al. (1999) opine that female directors on the board help to prevent risky projects because they are more conservative, specifically risk-averse, unlike men.

The relationship between board gender diversity and cash holdings has been mixed. A particular line of study found a positive relationship (Schoubben & VanUytbergen, 2014), while another found an inverse relationship (Ikueze & Egungwu, 2017). Also, some found a significant impact (Ikueze & Egungwu, 2017). The Nigerian Code of CG stipulates that a corporate board should promote diversity in its membership across a variety of attributes relevant for promoting better decision-making and effective governance. One of the attributes the code encourages is gender diversity.

Although the code did not make it mandatory, unlike countries such as Norway, Sweden, and the USA. In line with the position that female directors are conservative and averse to risk, one would expect high cash holdings on a female-dominated board. However, in the Nigerian context, we do not expect the risk-averse and conservative nature of female directors to lead to high cash holdings because female directorship is small, unlike in countries such as Norway, where there is a mandatory 40% representation on the board of public companies.

In line with the above argument, the study seeks to examine whether a female directorship in the Nigerian context can limit managers' access to free cash flow in order to mitigate agency conflict over

its deployment. Hence, the hypothesis is stated as follows:

H_5: There is a significant inverse association between board gender diversity and cash holdings of non-financial firms listed on the NGX.

Institutional ownership refers to a fraction of a firm's shares that are held by institutional investors such as banks, insurance companies, and pension funds (Chung & Zhang, 2014). This implies that they are investment firms that hold large shareholdings in an investee's firm. Unlike dispersed shareholders, institutional shareholders have strong fiduciary responsibilities, which gives them a strong incentive to choose stocks of companies with a good governance structure. The monitoring capacity of institutional shareholdings has been brought to bear in fostering better CG practices. The Nigerian code of CG gives credence to institutional shareholders' roles when it states that the board should encourage institutional investors to positively influence the standard of CG and promote value creation in the company. It is also to monitor conformance with the provisions of the code and raise concerns as appropriate.

Given that the agency problem mainly emanates from managers' conflicting interests with shareholders, managerial opportunistic tendencies could be checked if shareholders had the capacity to monitor managers' activities, and institutional shareholders play a vital role in this regard. In the Nigerian context, the provisions of the CG Code on the role of institutional shareholding have enjoyed wide acceptance.

The relationship between institutional ownership and cash holdings has been mixed. A particular line of study found a positive relationship (Khan & Tanveer, 2016), while another found an inverse relationship (Anabestani & Shourvarzi, 2014). Also, some found a significant impact (Azinfar & Shiraseb, 2015), while others found it insignificant (Anabestani & Shourvarzi, 2014; Khan & Tanveer, 2016). For the explanation of the positive relationship between institutional ownership and corporate cash holdings, the position of Grossman and Hart (1980) that only large shareholders, such as institutional owners, can achieve satisfying benefits from the rather costly process of monitoring could be a pointer that they may extract private benefits to the detriment of small shareholders, which could be in the stockpiling of cash. On the contrary, institutional shareholders may not be interested in short-term goals. The long-term time horizon of these kinds of investors could make shares of corporate entities with short-term goals less marketable (Maug, 1998). Consequently, institutional investors that have a preference for growth firms are likely to invest in such firms and may not necessarily be interested in firms stockpiling cash. Grossman and Hart (1980) state that large shareholders play a key role in effectively monitoring the activities of firm managers and insider shareholders, thus alleviating the free-rider problem associated with dispersed small shareholders. In line with this argument, the study seeks to examine whether institutional shareholdings in the Nigerian context can limit managers' access to free cash flow in order to mitigate agency conflict over its deployment. Hence, the hypothesis is stated as follows:

H_6: There is a significant inverse association between institutional ownership and cash holdings of non-financial firms listed on the NGX.

Theoretical framework

Dynamic trade-off theory

The partial dynamic model of the study is anchored on the dynamic trade-off theory developed by Fischer et al. (1989). The dynamic trade-off theory emphasizes that firms have a target that maximizes their value and that deviations from that target are costly. Hence, such deviations need to be removed over time. Unlike the static model, the dynamic model assumes that the firm's observed cash ratio is not necessarily identical to the desired cash ratio. Therefore, they tend to adjust toward such a desirable cash ratio. The adjustment to a desirable cash ratio level is not immediate because of the

associated adjustment cost. Therefore, it follows an adjustment process where the first lag of the dependent variable (CASHit-1) is used as an explanatory variable, and this results in dynamic modeling. Consistent with this study, the existing literature generally supports the existence of long-run target cash holdings and agrees with the notion that firms converge to that target gradually at a certain SOA, but the magnitude of the SOA is not a settled issue.

Agency theory

The association between CG variables as used in this study (board independence, board size, CEO equity ownership, board gender diversity and institutional ownership) and cash holdings is anchored on agency theory. Agency theory is enunciated by Berle and Means (1932) and formalised by Jensen and Meckling (1976). The theory posits that, without a control threat, it becomes difficult if not impossible to convince self-interested managers to hold a desirable cash level. There are considerations surrounding ensuring adequate and optimal liquidity positions for the company on the other hand, there is the issue of free cash flow hypothesis which points to the possibility that shareholders will choose to limit a manager's access to free cash flow in order to mitigate agency conflict over its deployment. This has led to a trade-off between providing sufficient cash level for managers to efficiently fund all good projects and the motive to hoard cash which could be misappropriated.

However, an important point worthy of note is the fact that in whatever direction, of need for adequate liquidity and the cost of free cash flow, the CG structure is a critical factor in the decision matrix. Whether management is demanding for more or less liquidity for transaction, precaution and speculative motives for holding cash, CG through the board structure oversees the ratifications of such initiatives. Again, where there is the suspicion of managerial opportunism using free or excess cash flow, it is the duty of CG to address such issues and prevent agency crisis, which is the main idea of this paper. Within the context of this study, it could be succinctly deduced that board structure such as board independence, board size, board equity ownership, board gender diversity as well as institutional ownership would influence managers behavior, with specific reference to cash holdings behavior. It is believed that boards dominated by independent non-executive directors are presumed to carry out the monitoring function on behalf of shareholders to provide effective oversight on managers that maximize shareholders' interests (John & Senbet, 1998). Therefore, the study expects an independent board to constrain cash holdings behvoiur of managers. In terms of board size, there seems not to be a unanimous agreement on which board size provides better corporate board efficiency. Proponents of a small board size opined that it contributes more to the success of the organization through prompt and precise decision-making (Yermack, 1996). In line with the argument that small board sizes contribute more to the success of the organization through prompt and precise decision-making, the study expects a small board size to constrain cash holdings behvoiur of managers.

In terms of CEO equity ownership, Johnson and Yi (2015) posit that an influential CEO can manipulate the CG mechanism that imposes constraints on its actions through managerial powers. A dominant CEO is perceived as one who has power and influence over a firm, its management, and possibly the board (Park et al., 2015). However, shareholders can use CEO equity ownership to forestall value destroying tendencies of CEOs. In this instance, equity compensation could be used by shareholders to achieve small cash holdings in order to forestall value-destroying decisions by managers. However, beyond a certain threshold, managers will become so powerful and dominant that it could lead to a stockpiling of cash. Therefore, the study expects low CEO equity ownership to constrain cash holdings behavoiur of managers. On board gender diversity, the FRCN

(2018) Code of CG stipulates that corporate board should promote diversity in its membership across a variety of attributes relevant for promoting better decision-making and effective governance. One of such attributes the code encourages is gender diversity. Female directors possess resources such as prestige, skills, knowledge, and external linkage women possess, they are often appointed to corporate boards (Dang & Vo, 2012).

Although, the risk adverse and less confident nature of female directors on the board could make a firm hold more cash, however, in the Nigerian context, we do not expect the risk-averse and conservative nature of female directors to lead to high cash holdings because female directorship is small, unlike in countries such as Norway, where there is a mandatory 40% representation on the board of public companies. Therefore, the study expects board gender diversity to constrain cash holdings behavior of managers. Finally, the monitoring capacity of institutional shareholdings have been brought to bear in fostering better CG practices. The Code of CG in Nigeria laid credence to institutional shareholders' role when it states that the board should encourage institutional investors to positively influence the standard of CG and promote value creation in the company. It is also to monitor conformance with the provisions of the code and raise concerns as appropriate. Given that the agency problem mainly emanates from managers' conflicting interest with shareholders, managerial opportunistic tendencies could be checkmated if shareholders had the capacity to monitor managers' activities, and the institutional shareholders play vital role in this regard. Therefore, the study expects institutional equity ownership to constrain cash holdings behavior of managers.

3. Research method

The study adopts the positivism research philosophy and deductive research approach. The choice of the research philosophy is that the study is undertaken, as far as possible, in a value-free way. The choice of the deductive approach is appropriate because the data collected are used to evaluate hypotheses in relation to existing theories.The study adopts a longitudinal research design for two reason: (i) the study involves repeatedly examining the same set of cross sections over a period of time to detect any change that might occur; and (ii) the collection of data on a number of variables without trying to influence those variables. The population is one hundred and thirty-three (133) non-financial firms listed on the NGX during the period 2011 and 2020.

The reason for choosing the non-financial sector is that cash holdings of firms in the financial sector exhibit distinct peculiarities of being exogenously determined (regulation-based), consequently the study excludes them. In order to aid generalizability, the study took a census of the entire population as its sample. However, due to the desire to have a balanced data panel, the sample shrank to eighty-eight firms (88) after filtering out those firms for which the researchers could not access the complete annual reports.

Sources of data

The study relies on secondary sources of data. The data were obtained from the annual reports of each of the firms included in the sample. The data are relied upon due to the requirement of an external audit of all publicly quoted companies on the NGX by the Companies and Allied Matters Act (CAMA) that companies present accounts that are a true and fair reflection of the state of affairs of the company.

Method of data analyses

The study adopts both the system GMM and quantile estimation techniques. The choice of the GMM is suitable for the dynamic model due to the suspicion of endogeneity in the estimated model as a result of lagged cash that is used as one of the explanatory variables. It provides consistent parameter estimates by utilizing instruments that can be obtained from the orthogonality conditions that exist between the lagged values of a variable and the disturbance term. The quantile regression parameter estimates the change in a specified quantile of the response variable. It allows studies to examine the

impact of CG at different points in the distribution of a firm's cash holdings.

Model Specification

The partial dynamic model is anchored on the dynamic trade-off theory developed by Fischer et al. (1989) while the the association between CG variables as used in this study (board independence, board size, CEO equity ownership, board gender diversity and institutional ownership) and cash holdings is anchored on agency theory. Relying on both the dynamic trade-off and agency theories, the study expects a dynamic partial adjustment to a target cash holdings bahaviour and that board strcuture such as indedependence, size, CEO equity ownership, gender diversity as well as institutional equity ownership play significant role in constraining managers' access to free cash flow in order to mitigate agency conflict over its deployment.

Assumption of target cash level

According to Ozkan and Ozkan (2004), there exists an unobservable target cash holding for firms, which is designated as CASHit*. The determinants of CASHit* can be modeled thus:

$$CASH_{it}^{*} = \sum_{k} \beta_k x_{kit} + \varepsilon_{it} \quad \text{.............................. (1)}$$

Where CASH* represents target cash holdings, i represents firms, t represents time, and k represents firm-specific attributes (the focus of this study is internal CG mechanisms). The target cash holdings are unobservable; hence, they are proxy by the fitted values from a regression of observed cash holdings. Mathematically, the target cash holdings (CASHit*) are expressed as:

$$CASH_{it}^{*} = CASH_{it} - CASH_{it-1} \quad \text{....................... (2)}$$

The standard partial adjustment model required to capture the dynamic adjustment to a target cash holding is expressed below:

$$\gamma(CASH_{it}^{*} - CASH_{it-1})\ 0 < \gamma < 1 \quad \text{.................... (3)}$$

Both Eq. (2) and Eq. (3) can be written together as:

$$CASH_{it} - CASH_{it-1} = \gamma(CASH_{it}^{*} - CASH_{it-1})\ 0 < \gamma < 1 \quad \text{.................... (4)}$$

Where CASHit = current cash levels of each firms at time't'; CASHit-1 = lagged one period year cash holdings; γ= adjustment required to reach the firms' target cash holdings. The coefficient measures the speed of adjustment which is inversely related to adjustment/transaction cost. A significant γ coefficient suggests that cash holdings exhibits a dynamic adjustment over time. γ takes the values between zero (0) and one (1). Full adjustment occurs where γ= 1, while there is the absence of adjustment when γ= 0. Therefore, the partial adjustment lies between 1 and 0. Thus, the SOA is estimated as 1- γ and the time taken to achieve the target cash holdings is 1/1- γ. If γ=0, it shows that firm will not adjust to a target cash holding (CASHit=CASHit-1). This indicates high transaction cost in achieving the target cash holdings as such firms would want to maintain their current year cash holdings. If γ=1, it shows that firm will adjust to a target cash holding, therefore target cash holdings becomes the same with current year cash holdings (CASHit*=CASHit). This indicates low transaction cost in achieving the target cash holdings as such firms would want to switch to such target cash holdings. Giving that target cash is CASHit - CASHit-1, when substituted into CASHit*=CASHit, the expression becomes CASHit - CASHit-1 = CASHit. This can also be re-written as CASHit - CASHit= CASHit-1, therefore CASHit = CASHit-1. However, an estimation of the partial adjustment model can be done in a single step equation by substituting the target cash holdings in Eq. (1) into the partial adjustment model in Eq. (4). Therefore, a single step equation is derived thus:

$$CASH_{it} = \gamma CASH_{i,t-1} + \sum_{k=1}^{k} \beta_k x_{it} + \gamma_i + \gamma_t + \varepsilon_{it} \quad \text{..................... (5)}$$

$$CASH_{it} = (1-\gamma) CASH_{i,t-1} + \sum_{k=1}^{k} \beta_k x_{it} + \gamma_i + \gamma_t + \varepsilon_{it} \quad \text{............ (6)}$$

Where: 1- γ = speed of adjustment to target cash holdings, β= unknown coefficients of the explanatory variables, xit= explanatory variables. For the purpose of this study, dependent variable is cash holdings (CASH) while the explanatory variables are: board independence (BND); board size (BS); Chief Executive Officer equity ownership (CEOOWN); board gender diversity (BGD); and institutional share ownership (INSTOWN). i= cross section (1…88); t= time (1…10); γ_i= fixed effects resulting from the presence of macro-economic phenomena in a given time period which is fixed across firms but varies over time; and γ_t= firm unobservable heterogeneity which is fixed over time but varies across firms. When inserted into Eq. 6, Eq.7 is derived thus:

$$\mathrm{CASH}_{it} = \beta + (1-\gamma)\mathrm{CASH}_{it-1} + \beta_1\mathrm{BND}_{it} + \beta_2\mathrm{BS}_{it} + \beta_3\mathrm{CEOOWN}_{it} + \beta_4\mathrm{BGD}_{it} + \beta_5\mathrm{INSTOWN}_{it} + \gamma_i + \gamma_t + \varepsilon_{it} \quad \ldots\ldots (7)$$

Measurement of variables

The proxy for the dependent variable, which is cash holdings (CASH), is measured as a percentage of cash and cash equivalents to total assets (Ogundipe et al., 2012). For the explanatory variables, they are measured as follows:

Lagged cash holdings (CASH_{it-1}) are a result of the dynamic modelling of cash holdings as proved from Eq. 1. to Eq. 7. It is anchored on the dynamic trade-off theory by Fischer et al. (1989). The dynamic trade-off theory emphasizes that firms have a target that maximizes their value and that deviations from that target are costly. Hence, such deviations need to be removed over time. The studies of Orlova and Rao (2017) and Ogundipe et al. (2012) found that cash holdings exhibit a partial dynamic adjustment.

Board independence (BND) is measured by the percentage of independent non-executive directors to the total number of directors on the board (Kuan et al., 2011). According to agency theory, BND is a key internal CG mechanism that plays a role in curtailing agency crises, particularly managerial excesses over free cash flow. Thus, it is expected that BND should have a prior inverse relationship with cash holdings. This is supported by the studies of Safdar (2017) and Hannan and Asghar (2013), who found an inverse relationship between board independence and cash holdings.

Board size (BS) is measured by the number of directors on the board (Kuan et al., 2011). What is obtainable in the Nigerian code of CG is that the BS should be in line with the complexities and scale of operations of firms. Arguments as to the optimal board size are unsettled. However, the study found that the average board size of Nigerian firms is 8, which could be aligned with a small board size. Relying on agency theory and prior literature, a school of thought believes that small board sizes contribute more to the success of the organization through prompt and precise decision-making. Thus, it is expected that BS should have an inverse relationship with cash holdings. This is supported by the studies of Khan and Tanveer (2016) and Lingesiya (2017), which found an inverse relationship between board size and cash holdings.

Chief Executive Officer share ownership (CEOOWN) is measured by the percentage of CEO equity ownership to board equity ownership (Ozkan & Ozkan, 2004). According to the agency theory, convergence of interest between managers and shareholders could be achieved by the CEO's equity holdings. Therefore, equity compensation could be used by shareholders to achieve small cash holdings in order to forestall value-destroying decisions by managers. Thus, it is expected that CEOOWN should have a prior inverse sign with cash holdings. This is supported by the studies of Ikueze and Egungwu (2017) and Ozkan and Ozkan (2004), who found an inverse relationship between chief executive officer equity ownership and cash holdings.

Board gender diversity (BGD) is measured by the percentage of female directors on the board compared to the total number of directors on the board (Ullah & Kamal, 2017). The Nigerian Code of

CG stipulates that a corporate board should promote diversity in its membership across a variety of attributes relevant for promoting better decision-making and effective governance, and one of such attributes is gender diversity. It is believed that the risk-averse and conservative nature of female directors would lead to high cash holdings. However, in the Nigerian context, we expect otherwise. The reason being that the number of females in the Nigerian board, with an average of 8.59%, is small to entrench the effect of their risk-averse and conservative nature. Therefore, it is expected that BGD should have an inverse relationship with cash holdings. This is supported by the studies of Ikueze and Egungwu (2017), which found an inverse relationship between board gender diversity and cash holdings.

Institutional share ownership (INSTOWN) is measured by the percentage of equity holdings held by corporate investors to the total value of equity holdings in the entity (Chung & Zhang, 2014). The Nigerian code of CG gave credence to institutional shareholders' roles when it stated that the board should encourage institutional investors to positively influence the standard of CG and promote value creation in the company. Therefore, relying on the agency theory and the arguments that INSTOWN has strong monitoring capacity, it is expected that INSTOWN should have a prior inverse relationship with cash holdings. This is supported by the studies of Khan and Tanveer (2016) and Anabestani and Shourvarzi (2014), which found an inverse relationship between institutional ownership and cash holdings.

4. Results and discussion

Descriptive statistics

The decsritive statistics show the summary of the data set in terms of the mean, median, maximum and minimum observations, as well as the distribution of the data. The result is prrsented below:

Table 1. Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. dev.	Jarque-Bera	Prob.	Obs.
CASH	9.352	5.41	96.730	-4.930	11.423	3353.929	0.000	857
BND	64.932	66.67	94.44	10	15.864	28.125	0.000	857
BS	8.968	9	23	4	2.635	397.516	0.000	857
CEOOWN	4.256	0	50.41	0	10.170	1767.4	0.000	857
BGD	8.585	9.09	44.44	0	9.339	116.335	0.000	857
INSTOWN	49.951	56	98	0	26.172	49.778	0.000	857

Source: Researcher's computation (2023) from E-View 9

The mean values for the variables are: CASH = 9.352; BND = 64.932; BS = 8.968; CEOOWN = 4.256; BGD = 8.585; and INSTOWN = 49.951. This suggests that cash holdings constitute 9.35% of total assets, non-executive directors are 64.93% of the total number of directors, the size of the board is 8 members, CEO equity ownership to total equity holdings is 4.26% and institutional equity holdings to total equity holdings is 49.95%.

The maximum and minimum values vary accordingly, from highest to lowest, during the study periods. The standard deviations of 11.423, 2.635, 10.170 and 9.339 for CASH, BS, CEOOWN, BGD are closer to their respective mean values. This implies that the variables are clustered around the mean values. While the standard deviations of 15.864 and 26.172 for BND and INSOWN are far from their respective means, this implies that the variables are largely dispersed from their means to constitute a high level of risk factors in the non-financial sector in Nigeria. The J-Berra statistics and their corresponding probability values are significant at a 5% confidence level. However, the Central Limit Theorem implies that the violation of the normality assumption poses no major problem in panel data analysis, especially with large firm-year observations.

Pearson correlation result

The correlation explains whether there is a relationship or association between any two variables. That is, the relationship between the explanatory variables (board independence, board size, CEO equity ownership, board gender diversity and institutional ownership) and the explained variable, which is cash holdings. The result is presented in Table 2.

The Pearson correlation results reveals that BND positively correlates with CASH(r=0.019) and statistically insignificant at 5% [p=0.570], BS positively correlates with CASH(r=0.018) and statistically insignificant at 5% [p=0.600], CEOOWN inversely correlates with CASH(r=-0.137) and statistically significant at 5% [p=0.000], BDG positively correlates with CASH (r=-0.056) and statistically insignificant at 5% [p=0.098] while INSTOWN positively correlates with CASH(r=0.182) and statistically significant at 5% [p=0.000].

Table 2. Pearson correlation result

	CASH	BND	BS	CEOOWN	BGD	INSTOWN
CASH	1					
BND	0.019	1				
	[0.570]					
BS	0.018	0.081*	1			
	[0.600]	[0.017]				
CEOOWN	-0.137*	-0.200*	-0.236	1		
	[0.000]	[0.000]	[0.000]			
BGD	0.056	-0.057	0.092*	0.037	1	
	[0.098]	[0.092]	[0.007]	[0.277]		
INSOWN	0.182	0.143*	0.039	-0.304	-0.130*	1
	[0.000]	[0.000]	[0.248]	[0.000]	[0.000]	

Source: Researcher's compilation (2023)

The inter-correlations between the variables reveals that BND positively correlates with BS (r=0.081) and statistically significant at 5% [p=0.017] while CEOOWN inversely correlates with BND (r=-0.200) and statistically significant at 5% [p=0.000]. Again, it is observed that INSTOWN inversely correlates with CEOOWN (r=-0.304) and statistically significant at 5% [p=0.000]. The positive correlations suggest that an increase in one variable will result in an increase in the other variable and vice versa, while the inverse correlations imply that an increase in one variable will be associated with a decrease in the other variable and vice-versa. However, correlations do not necessarily imply functional dependence and causality in a strict sense. Therefore, regression analysis is more suitable for that purpose.

SOA distributional dynamics

Employing quantile estimation, the study probes further into examining the distributional dynamics in the SOA of firms towards optimal cash holdings decision. The usefulness of the quantile regression technique is that unlike the panel regression which does not show the effect of an independent variable on different level of the dependent but is regarded as a mean regression, the quantile regression parameter estimates the change in a specified quantile of the response variable.

The conditional quantile regression traces the entire distribution of the independent variable, conditional on a set of categories for the dependent variable. The quantile estimates are generated for different ranges for cash holdings structure that allow us to examine the impact of CG at different points of the distribution of firm's cash holdings.

Table 3. SOA distributional dynamics

Quantile	Coefficient	Std. Error	T-statistic	Prob.	Speed of adjustment
		Aggregate sample			
0.1	0.1575	0.0476	3.3021	0.001*	0.842
0.2	0.3179	0.0474	6.6983	0.000*	0.682
0.3	0.4612	0.0699	6.5947	0.000*	0.539
0.4	0.6326	0.0417	15.142	0.000*	0.367
0.5	0.7089	0.0399	17.760	0.000*	0.291
0.6	0.7993	0.0353	22.642	0.000*	0.200
0.7	0.8767	0.0524	16.712	0.000*	0.123
0.8	0.9226	0.0539	17.107	0.000*	0.077
0.9	0.9563	0.0546	17.487	0.000*	0.044
		Pharmaceutical industry			
0.1	-0.02225	0.148188	-0.15012	0.881	1.022
0.2	0.00426	0.162229	0.026258	0.979	0.996
0.3	-0.00579	0.183086	-0.03164	0.975	1.006
0.4	0.147028	0.183227	0.802432	0.427	0.853
0.5	0.111036	0.148316	0.748643	0.459	0.889
0.6	0.069071	0.197776	0.349237	0.729	0.931
0.7	0.04929	0.205715	0.239602	0.812	0.951
0.8	-0.00876	0.189351	-0.04624	0.963	1.009
0.9	-0.05722	0.256031	-0.22347	0.824	1.057
		Oil and gas industry			
0.1	0.64782	0.230618	2.809067	0.008*	0.352
0.2	0.560877	0.181264	3.094259	0.004*	0.439
0.3	0.468908	0.194634	2.409186	0.021*	0.531
0.4	0.246862	0.147414	1.674615	0.102	0.753
0.5	0.222526	0.148538	1.498108	0.142	0.777
0.6	0.168375	0.148321	1.135208	0.263	0.832
0.7	0.224373	0.12426	1.805672	0.079	0.776
0.8	0.321236	0.213336	1.505773	0.140	0.679
0.9	0.37747	0.214988	1.755774	0.087	0.623
		Consumer goods industry			
0.1	0.423875	0.140838	3.009657	0.004*	0.576
0.2	0.475017	0.121007	3.925517	0.000*	0.525
0.3	0.555681	0.117819	4.716396	0.000*	0.444
0.4	0.485098	0.120913	4.011952	0.000*	0.515
0.5	0.559962	0.13602	4.116754	0.000*	0.440
0.6	0.691709	0.123068	5.620556	0.000*	0.308
0.7	0.617099	0.170611	3.616989	0.001*	0.383
0.8	0.453279	0.220074	2.059671	0.043*	0.547
0.9	0.450938	0.177654	2.538297	0.013*	0.549
		Diversified industry			
0.1	0.267605	0.172209	1.553953	0.125	0.732
0.2	0.264909	0.175176	1.512247	0.136	0.735

0.3	0.436987	0.295288	1.479865	0.144	0.563
0.4	0.534237	0.163438	3.268737	0.002*	0.466
0.5	0.559947	0.130844	4.279508	0.000*	0.440
0.6	0.537559	0.113434	4.73895	0.000*	0.462
0.7	0.44151	0.195153	2.262381	0.027*	0.558
0.8	0.40846	0.159031	2.568424	0.013*	0.592
0.9	0.925131	0.389835	2.373135	0.021*	0.075
		Food and beverage industry			
0.1	0.243162	0.048147	5.050443	0.000*	0.757
0.2	0.311289	0.062725	4.962765	0.000*	0.689
0.3	0.319824	0.069454	4.604817	0.000*	0.680
0.4	0.405606	0.060506	6.703599	0.000*	0.594
0.5	0.386994	0.075091	5.153631	0.000*	0.613
0.6	0.483224	0.152059	3.177882	0.002*	0.517
0.7	0.578131	0.195443	2.958048	0.004*	0.422
0.8	0.663529	0.137903	4.811556	0.000*	0.336
0.9	0.542324	0.233381	2.323772	0.021*	0.458
		Building industry			
0.1	0.806633	0.169675	4.753988	0.000*	0.193
0.2	0.924838	0.195841	4.722398	0.000*	0.075
0.3	0.851284	0.10175	8.366455	0.000*	0.149
0.4	0.85982	0.089284	9.630213	0.000*	0.140
0.5	0.840473	0.094939	8.852766	0.000*	0.160
0.6	0.932445	0.098194	9.495952	0.000*	0.068
0.7	0.894916	0.120876	7.40357	0.000*	0.105
0.8	0.875621	0.221009	3.96193	0.000*	0.124
0.9	0.725349	0.100445	7.221327	0.000*	0.275

Source: Researcher's compilation (2023) from E-View

Using quantile estimation, the study delves deeper into the distributional dynamics in firms' SOAs toward their target cash holdings decisions (Table 3). From the estimate, we find it interesting that the SOA is higher for firms with a lower cash holdings quantile. For Q [0.1], which is the lowest, the SOA is 0.842; for Q [0.2], the SOA is 0.682; for Q [0.3], the SOA is 0.539; and for Q [0.4], the SOA is 0.367. Going further, for Q [0.5], SOA is 0.291, and this reduces further to 0.123 for Q [0.7], and then to 0.044 in Q [0.9].

The results thus clearly highlight at the 5% significance level that the SOA depends on the level of cash holdings and that for firms with lower cash holding levels, the SOA to a target cash holding whenever there are deviations is faster, but as the firm moves up to higher cash holding levels, the SOA tends to reduce.

Multivariate test of hypotheses

The study performed the system GMM regressions on the cash holdings model in Eq. 7. Table 4 shows the results of GMM regressions. The J-stat tests yield all p-values above 0.10, which implies that over-identification restrictions are valid. The AR (1) test gives p-values of 0.00, which indicate that the residuals in the first differences are correlated as expected, while the AR (2) test gives p-values of 0.80, which implies that a null hypothesis of no second-order serial correlation could not be rejected. On the explanatory variable, the coefficient shows that the sign of [CASH (-1)] is positive (0.251). The value is also significant (p=0.000<0.01)

at 1%. Given that a significant [CASH (-1)] coefficient as represented by γ suggests that cash holdings exhibit a partial dynamic adjustment over time, the results conform to the first hypothesis of the study.

The SOA (1-0.251) is 0.749, which suggests the partial adjustment to target cash holdings is quite high and indicates the extent to which non-financial firms listed on the NGX will achieve target cash holdings whenever there are deviations. The time it will take for such an adjustment to be achieved is one year, three months, and four days (1/0.749 = 1.34). A possible reason for the high SOA in the Nigerian context is that firms may, on their own, enjoy a favorable credit policy with their respective banks. In the same vein, in line with Ozkan and Ozkan (2004), there is a need to quickly rebalance whenever there are deviations because such deviations could be significant and non-persistent over time.

Table 4. Dynamic panel GMM result

Variable	**Apriori Sign**	**Eq.7**
$CASH_{(-1)}$	+	0.2506***
		(5.1066)
		{0.0000}
BND	-	-0.2599***
		(-3.0174)
		{0.0026}
BS	-	-1.4499***
		(-3.4314)
		{0.000}
CEOOWN	-	-0.9341***
		(-3.8783)
		{0.000}
BGD	-	-0.0091
		(-0.0803)
		{0.9361}
INSTOWN	-	-0.1037
		(-0.8080)
		{0.4194}
Mean VIF		4.0952
J-statistic		32.725
J-stat. prob		0.578
Instrument rank		44
AR(1)-p-value		0.00
AR(2)-p-value		0.80

T-Statistic (); p-value {}; ***, ** & * sig @ 1%, 5% and 10% respectively;
Source: Researcher's compilation (2023) from E-View 9

The study of Orlova and Rao (2017) investigates cash holdings in SOA. The sample size consisted of all US firms between 1968 and 2012. The GMM result revealed that US firms exhibit dynamic adjustment to an optimal cash level with an SOA of 0.54. Ogundipe et al. (2012) examine the determinants of corporate cash holdings in Nigeria. The sample consisted of non-financial listed firms on the Nigerian Stock Exchange between 1995 and 2009. The GMM result showed evidence that Nigerian firms adjust to a target cash level with an SOA of 0.89.

However, there are other studies that found dynamic adjustment, however with low SOA. Do (2018) examined cash holdings, corporate governance mechanisms and firm value in transition economies. The sample size consists of six hundred and ten listed firms between 2007 and 2015, the

GMM result showed evidence that firms in Vietnam adjust to an optimal cash level with an SOA of 0.44 at 1% level of significance. Abdioglu (2016) investigates managerial ownership and corporate cash holdings of firms in Turkey between 2005 and 2013. Using an unbalanced panel of one hundred and eighty-one firm year observations, the result showed that firms in Turkey exhibit a dynamic adjustment to a target cash holding with an adjustment speed of 0.43. Rehman and Wang (2015) investigate corporate cash holdings and adjustment behaviour in Chinese firms. Using one thousand, six hundred and thirty-two listed firms for a period of thirteen years (2001 to 2013), the study showed evidence that Chinese firms adjust to a target cash level with an SOA of 0.45. The study of Wong and Yang (2013) examine the effect of corporate governance on cash holdings of Hong Kong firms. The study sample consist of one hundred and sixty firm year observation between 2010 and 2011. The GMM result showed evidence that Hong Kong firms adjust to an optimal cash holdings level with an SOA of 0.37. Low SOAs indicates that firms will slowly move towards a target cash holding over a relatively long period of time. This implies that adjustment cost is high. Also, the firm specific characteristics such as default risk, bankruptcy cost and the growth rate are low. From the foregoing, the SOA to an optimal cash level becomes germane for managers of firms to formulate strategic financial plans such that managers who are faced with low SOA must hold high cash reserves in order to avoid cash shortfalls which requires costly adjustment, unlike managers of firms with high SOA who need not accumulate high cash reserves.

The coefficient shows that the sign of the BND is inverse (-0.260), which is consistent with the a priori expectation. The coefficient value is also significant ($p=0.003<0.05$) at 5%. The result conforms to the second hypothesis of the study. A possible reason for the inverse association is that an independent board provides better shareholder protection, so the agency cost of holding cash is reduced. The result is in conformity with agency theory and in support of the study of Safdar (2017), who examines the impact of ownership structure on cash holdings and debt maturity structure. The sample size consisted of seventy-four firms listed on the Pakistan Stock Exchange between 2006 and 2013, and the fixed effect panel result revealed that board independence exhibits inverse significant impact on cash holdings at the 5% level of significance. The study of Ikueze and Egungwu (2017) who examine corporate governance and cash holdings of manufacturing firms in Nigeria. The sample size consists of five firms between 2012 and 2015. The estimation result revealed that board independence had inverse relationship, however insignificant impact on cash holdings. The study of Lingesiya (2017) who examines the impact of corporate governance practices on firm cash holdings in an emerging market. The sample size consists of twenty-six manufacturing firms listed in Colombo Stock Exchange between 2011 and 2015. The fixed effect estimation result revealed that board independence exhibits inverse relationship, however it had insignificant impact on cash holdings. On the contrary, some studies showed positive relationship. Ulla and Kamal (2017) who examined board characteristics, political connections and corporate cash holdings, the moderating role of firm size and political regime. The GMM result revealed that board of director independence exhibits significant positive relationship with cash holding at 1% level of significance. The study of Sheikh and Khan (2015) examine the impact of board attributes and insider ownership on corporate cash holdings. The sample consist of one hundred and eighty-nine non-financial firms listed in Pakistan Stock Exchange between 2008 and 2012, the result showed that board independence exhibits positive significant impact on cash holdings at 10% level of significance.

The study of Rahman and Muhamad (2013) examined corporate governance and firm cash holdings in Malaysia. The sample size consists of five hundred and twelve firms in 2009. The GMM result showed that board independence of Malaysia firms exhibits significant positive impact on cash

holdings at 5% level of significance. A possible reason for the positive association could be explained against the backdrop of entrenchment view that outside independent board members are capable of becoming entrenched, therefore inefficiency results in the form of unchecked deployment of corporate assets or transactions (Morck et al., 1988). In the same vein, Agrawal and Knoeber (1996) state that outside directors could be appointed for political reasons rather than to objectively carry out their role. Hermalin and Weisbach (2003) observe that a corporate board with high proportion of independent directors does not always lead to better organisational performance. From the entrenchment perspective, a board dominated with outside independent directors could still yield an inverse relationship with organisational performance. However, the study recommends that Nigerian companies should adhere strictly to the provision of the Nigerian Code of CG on the composition of board of directors. A board with independent non- executive directors will improve the level of board independence. From an agency perspective, this could help reduce chances of managerial opportunism, using free cash flow.

The coefficient shows that the sign of the BS is inverse (-1.450), which is consistent with the a priori expectation. The coefficient value is also significant (p=0.000<0.01) at 1%. The result conforms to the third hypothesis of the study. A possible explanation for the inverse association is that small boards contribute more to the success of the organization through prompt and precise decision-making (Yermack, 1996). The result is in conformity with the agency theory and in support of the study of Khan and Tanveer (2016) on the impact of corporate governance on the cash holdings of Pakistani firms. The fixed panel estimation result revealed that board size in manufacturing firms exhibits an inverse relationship with cash holdings. Lingesiya (2017) examines the impact of corporate governance practices on firm cash holdings in an emerging market. The sample size consisted of twenty-six manufacturing firms listed on the Colombo Stock Exchange between 2011 and 2015. The fixed effect estimation result revealed that board size exhibits an inverse relationship with cash holdings. In the aforementioned study of Ab. Rahman and Muhamad (2013) on corporate governance and firm cash holdings in Malaysia, the GMM result showed that board size exhibits inverse relationship, however had insignificant impact on cash holdings of Malaysia firms. On the contrary, some studies showed positive relationship. In the aforementioned study of Rehman and Wang (2015) on corporate cash holdings and adjustment behaviour in Chinese firms, the GMM result revealed that board size exhibits positive significant impact on cash holdings at 5% level of significance. The study of Khalil and Ali (2015) examine the effect of family ownership on cash holdings of Pakistan firms. The sample consists of one hundred non-financial firms between 2008 and 2013. The fixed effect estimation result revealed that board size exhibits positive insignificant impact on cash holdings. Board size being positive is consistent with the notion that larger board have aversive attitude towards monitoring, it increases the likelihood of CEO entrenchment and consequently more cash holdings by firms (Hermalin & Weisbach, 2003). However, the study recommends that board size of firms should be sufficient to effectively undertake and fulfil its business, to oversee, monitor, direct and control the company's activities and be relative to the scale and complexity of its operation.

The coefficient shows that the sign of the CEOOWN is inverse (-0.934), which is consistent with the a priori expectation. The coefficient value is also significant (p = p=0.000<0.01) at 1%. The result conforms to the fourth hypothesis of the study. A possible explanation for the inverse association is that equity compensation could be used by shareholders to achieve small cash holdings in order to forestall value-destroying decisions by managers. The result is in conformity with agency theory and in support of the study of Ikueze and Egungwu (2017) on the CG and cash holdings of manufacturing firms in Nigeria. The result revealed that board ownership exhibits an inverse significant

impact on cash holdings at the 5% level of significance.

In the earlier mentioned study of Lingesiya (2017) on the impact of corporate governance practices on firm cash holdings in an emerging market, the fixed effect estimation result revealed that CEO duality exhibits inverse significant impact on cash holdings at 1% level of significance. The study of Abdioglu (2016) examines managerial ownership and corporate cash holdings, insights from an emerging market. The sample size consists of one hundred and eighty-one firm year observations between 2005 and 2013. The GMM result revealed that managerial ownership exhibits inverse significant impact on cash holdings at 1% level of significance.

In the aforementioned study of Sheikh and Khan (2015) on the impact of board attributes and insider ownership on corporate cash holdings, the result showed that insider ownership exhibits inverse significant impact on cash holdings at 5% level of significance. Ozkan and Ozkan (2004) on corporate cash holdings in UK firms, the GMM result revealed managerial ownership exhibits an inverse relationship with cash holdings. On the contrary, some studies showed positive relationship. In the aforementioned study of Do (2018) on cash holdings, corporate governance mechanisms and firm value in transition economies, the GMM result revealed that CEO duality exhibits positive significant impact on cash holdings at 10% level of significance.

The study of Azinfar and Shiraseb (2015) examine the impact of ownership structure on the level of cash holdings in companies listed in Tehran Stock Exchange. The sample size consists of ninety-six firms between 2004 and 2013, the result revealed that managerial ownership exhibits positive significant impact on cash holdings at 5% level of significance.

Droste and Gorenc (2015) investigated the effect of ownership structure and concentration on cash holdings. Using the panel least square estimation technique with a data set spanning fourteen years for one hundred and eighty-five thousand Norwegian firms, the study revealed that the coefficient on equity held by CEO which indicates insider ownership and the number of consecutive years of CEO which indicates entrenchment exhibit positive significant association with cash holdings.

In the earlier mentioned study of Hannan and Asghar (2013) on the impact of corporate governance on corporate cash holdings, the regression result showed that managerial ownership exhibits positive insignificant impact on cash holdings. The explanation for the positive relationship is that the more a CEO is entrenched, the greater his power within the company. CEOs who have been serving relatively longer tenure have a greater ability to accumulate cash.

According to Falaye (2004), corporate liquidity has the takeover deterring effect as cash holdings can be used by CEOs to defend themselves against hostile takeovers. Consequently, CEOs use their power to accumulate more cash thereby reinforcing their entrenchment within the company. However, CEO-entrenchment should be checked especially where it is beginning to stimulate expropriation by limiting the extent of ownership shares.

The coefficient shows that the sign of the BGD is inverse (-0.009), which is consistent with the a priori expectation. However, the coefficient value is insignificant ($p = 0.936 > 0.05$) at 5%. Therefore, the results do not conform to the fifth hypothesis of the study. A possible explanation for the inverse association is that the conservative and risk-averse nature of female directorship, which would have crystallized in high cash holdings, is of no effect on the Nigerian board. The reason is that the female directorship in the Nigerian board is still low; consequently, do not expect to see high cash holdings as would have been the case in other countries with high board gender diversity, such as Norway. The result is in conformity with the agency theory and in support of the study of Ulla and Kamal (2017), who investigate board characteristics, political connections, corporate cash holdings, and

the moderating role of firm size and political regime. The GMM result revealed that board gender diversity exhibits an inverse relationship with cash holdings. Ikueze and Egungwu (2017) examine the corporate governance and cash holdings of manufacturing firms in Nigeria. The result revealed that board gender diversity exhibits an inverse insignificant impact on cash holdings. The study of Ulla and Kamal (2017) investigate board characteristics, political connection and corporate cash holdings, the moderating role of firm size and political regime. The GMM result revealed that board gender diversity exhibits inverse significant impact on cash holding at 1% level of significance. On the contrary, some studies found positive relationship. The study of Schoubben and Van Uytbergen (2014) examine the effect of gender diversity on corporate cash holdings. The sample consist of two thousand, five hundred and sixty-three firm year observations from fourteen non-financial European companies between 2008 and 2012. The fixed effect estimation result revealed that board gender diversity exhibits positive significant impact on cash holdings at 1% level of significance. According to Byrnes et al. (1999), female directors on the board help to prevent risky projects because they are more conservative, specifically risk-averse, unlike men.

In the same vein, Loukil and Yousfi (2016) opine that female director seldom make risky and challenging investment which could negatively impact on a firm's performance. Consequently, the risk adverse and less confident nature of female directors on the board could make a firm hold more cash (Loukil & Yousfi, 2016). However, the study recommends that the board of directors should promote diversity in its membership across variety of attributes such as gender. Specifically, the board should have a policy to govern this process and establish measurable objectives for achieving diversity in gender and other areas.

The coefficient shows that the sign of the INSTOWN is inverse (-0.104), which is consistent with the a priori expectation. However, the coefficient value is insignificant ($p = 0.419 > 0.05$) at 5%. Therefore, the results do not conform to the sixth hypothesis of the study.

A possible explanation for the inverse association is that institutional shareholders play a key role in effectively monitoring the activities of firm managers and insider shareholders, thus alleviating the free-rider problem associated with dispersed small shareholders (Grossman & Hart, 1980). The result is in conformity with the agency theory and in support of the study of Khan and Tanveer (2016) on the impact of corporate governance on the cash holdings of Pakistani firms, comparing manufacturing and service industry firms. The fixed panel estimation result revealed that institutional ownership in manufacturing firms exhibits an insignificant inverse impact on cash holdings. In the aforementioned study of Safdar (2017) on impact of ownership structure on cash holdings and debt maturity structure, the fixed effect panel result revealed that institutional ownership exhibits inverse significant impact on cash holdings at 5% level of significance. Cruz (2015) on easy in cash holdings, the sample size consists of US firms between 1992 and 2014. The regression result revealed that institutional ownership exhibits inverse significant impact on cash holdings at 5% level of significance.

The study of Anabestani and Shourvarzi (2014) on cash holdings, firm value, and corporate cash holdings of firms listed in the Tehran Stock Exchange The fixed panel estimation result revealed that the institutional ownership of the firm exhibits an insignificant inverse impact on cash holdings. On the contrary, some studies showed positive relationship. In the aforesaid study of Azinfar and Shiraseb (2015) on the impact of ownership structure on the level of cash holdings in companies listed in Tehran Stock Exchange, the result revealed that institutional ownership exhibits positive significant impact on cash holdings at 5% level of significance.

The study of Kusnadi et al. (2015) examine institutional development, state ownership and corporate cash holdings of China firms. The sample

size consists of nine thousand, seven hundred and forty-three firm year observations between 1999 and 2007. The result revealed that institutional ownership exhibits positive significant impact on cash holdings at 5% level of significance. On the explanation of positive relationship between institutional ownership and corporate cash holdings, the position of Grossman and Hart (1980) that only large shareholders, such as institutional owners can achieve satisfying benefits from the rather costly process of monitoring could be a pointer that they may extract private benefits to the detriment of small shareholders which could be in the stock-piling of cash. Thus, they may alleviate conflicts of interest between managers and investors. However, their monitoring capacity could engender collusion with managers and directors to the detriment of other stakeholders. However, the study recommends that institutional shareholders should continually add their voices to corporate governance compliance by their active participation in monitoring, thereby alleviating the free-rider problem associated with cash holdings decisions.

5. Conclusions

The study examines CG and cash holdings among non-financial companies listed on the NGX. The sample consists of 88 with a ten-year time frame, starting from 2011 to 2020. The findings suggest that cash holdings exhibit a partial dynamic adjustment to target cash holdings, and the SOA to such target cash holdings is 0.75 (75%), which is achieved within a time frame of a year, three months, and four days.

The findings also show that, with the exception of board gender diversity and institutional ownership, variables such as board independence, size, and chief executive officer equity ownership exhibit an inverse significant impact on cash holdings at a 5% level. This implies that internal CG factors constrain the free-rider problem associated with free-cash flow, and this is consistent with a priori signs and theoretical stance. Therefore, in the Nigerian context, CG appears to be more concerned with ensuring cash holdings at levels that reduce managerial opportunism than encouraging higher cash holdings. Also, it appears that CG tends to be largely conservative and risk-averse in relation to driving, influencing, and ratifying corporate cash holdings decisions in the Nigerian context.

The study concludes that CG posture and concern in cash holdings decisions are avoiding free cash flow by limiting a manager's access to free cash flow in order to mitigate agency conflict over its deployment. The study adds to the existing literature, particularly in emerging economies such as Nigeria, by examining the impact of CG at different points in the distribution of a firm’s cash holdings.

The policy implication of the findings for practice is that the cash holdings of Nigerian firms should be planned based on their respective SOAs for their target cash holdings. This tends to forestall high cash holdings, which often escalate agency problems, and also avoid cash shortfalls, which impair liquidity. The study could not extend the empirical evidence to companies in the financial sector in Nigeria because cash holdings are regulation-based. The study recommends that future research look into cash holdings, taking into account firms that have near- and off-target cash holdings. Also, further studies may explore firm-specific drivers such as leverage, firm size, and profit on cash holding decisions of Nigerian firms. These can further enhance our understanding of the drivers of cash holding decisions among Nigerian firms.

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