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The influence of geopolitical risk on cash holding - internal control as a moderating variable in Saudi banks listed

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Abstract

The current study sheds light on the complex dynamics of cash holding decisions in the face of geopolitical risk and provides a new perspective on the internal control literature in Saudi banks. The purpose of the current study is to assess how internal controls enhance cash holdings and GPR management. The theoretical background offers a specific lens through which to examine how efficient internal controls affect cash management. Additionally, this study analyzes each component (Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring Activities) to verify the specific role of internal control in GPR and cash holdings. The research methodology is based on Saudi banks listed during the period from 2010 to 2023, with a final sample of 334 firm-year observations. Statistical results show that geopolitical risk (GPR_THREAT, GPR_ACT, GPR_BROAD, GPR_NARROW) has a positive and significant effect on the level of cash holdings. These results indicate that increasing geopolitical risk leads to holding more cash to avoid probable risks in the surrounding environment in Saudi banks. Furthermore, the internal control index (control environment, risk assessment, control activities, information and communication, monitoring) also has a positive and significant effect on cash holdings. The results demonstrate that the interaction between the geopolitical risk components and the internal control index has a significant positive effect on cash holdings, meaning the internal control index supports the original relationship between GPR and cash holdings in Saudi banks.

Keywords: Cash holding (CH), Geopolitical risk (GPR), Internal control (IC).

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1. Introduction

International financial reporting and accounting methods are influenced by geopolitical conflicts, which encompass a wide range of tensions, disagreements, and power struggles between countries or regions [1]. Geopolitical risk (GPR) is the

possibility of wars, terrorist attacks, and disputes between governments that could disrupt the normal and peaceful flow of international relations [2, 3]. These conflicts can take many different forms, including military engagements, territorial disputes, trade disputes, and sanctions. Financial markets and global economic dynamics are significantly impacted by these wars [4]. Similarly, geopolitical risk is described by Balli et al. [5] as the possible negative impact of social, political, and economic developments on a region's stability and prosperity. This risk, which is a subcategory of political risk resulting from tensions and conflicts between nations that affect international relations, is a major concern for banks and other financial organizations in the Middle East & North Africa, as it can significantly impact their financial success [6-8].

Weaker economic conditions and other forms of uncertainty are not the same as this. This is because geopolitical uncertainty is primarily caused by unfavorable events such as wars, terrorist attacks, and tensions that occur outside the US but can still have a detrimental impact on US economic activity [3]. However, the heightened unpredictability brought on by unfavorable geopolitical developments may result in greater external financing costs, which would tighten financial constraints and increase the risk of financial distress. Therefore, companies that are more likely to rely on internal finances and, consequently, allocate less wealth to shareholders are those with higher cash flow unpredictability and a greater risk of financial difficulty [3, 9].

According to Omar et al. [10], economic entities' decisions to diversify are significantly influenced by geopolitical circumstances and significant events. Due to the fact that GPR creates uncertainty in corporate management Kelly et al. [11] and changes the business environment, resource reallocation, and cash holdings [12, 13] previous research indicates that it can have a significant impact on business decision-making, such as mergers and acquisitions [13] and business investments [14]. In addition to affecting international trade, GPR has a major impact on a nation's business climate, banking system, and corporate decision-making practices [15]. Since cash minimizes transaction costs and prospective investment losses from a shortage of capital, cash holdings (CH) are commonly discussed in principal-agent disputes and corporate governance research [16].

As a result, having cash on hand boosts productive investment and lowers the cost of external funding. However, there are more drawbacks to holding cash than benefits. Cash is a lower-returning asset, and companies with long-standing managers are more likely to have substantial cash holdings. If management monitoring is inadequate, this could lead to the agency issue of free cash flows [17, 18]. In this line, Kotcharin and Maneenop [19] examine how the GPR affects the cash reserves of the shipping industry; they find that during periods of high GPR, shipping companies are more likely to increase their cash holdings. GPR has a favorable impact on cash holdings, according to Lee and Wang [20]'s analysis of sample Chinese enterprises. This positive effect is more pronounced for firms with financial constraints than for those without.

Cash holdings are defined as assets that are highly liquid with a short maturity [21]. Businesses should weigh the costs and benefits of cash, according to the trade-off hypothesis. Although expanding cash holdings is not typically a top priority for businesses, this money is intended to improve production activities and procedures, which will ultimately affect investment and production choices [22]. Excessive cash holdings, however, may cause internal disputes and give companies the opportunity to abuse these assets for personal gain [21]. Company cash holdings, as well as abnormal cash holdings, have been the subject of numerous studies over the past few decades from a range of perspectives and under various circumstances [23-25].

Increased inspection and maybe larger cash reserves as a preventative action against perceived risks may result from known flaws in internal controls(IC) [26, 27]. According to Arianpoor and Mehrfard [28], it is generally believed that businesses with strong internal controls will keep their cash balances at their ideal levels. The Sarbanes-Oxley Act (SOX) of 2002 mandated internal control over financial reporting in response to a series of financial scams. These regulations divert businesses from their core operations, leading to increased compliance costs, reduced risk-taking, and impaired operational performance [26]. In this line [29], points to Saudi firms that often hoard cash as a safety net against adverse shocks to their cash flows when expensive external financing is available, and this behavior is worsened by uncertainties surrounding economic policies and geopolitical instability. Since companies usually utilize their cash flow first to finance successful endeavors during periods of high economic instability and GPRs, economic policy uncertainty (EPU) and GPRs increase corporations' precautionary cash holdings in Saudi Arabia.

As we have seen, there have not been many studies examining the relationship between GPR, internal control, and company cash holdings in Saudi banks. This study addresses this gap by analyzing each component (control environment, risk assessment, control activities, information and communication, and monitoring activities) to determine the role internal control plays in GPR and cash holdings. Therefore, this study aims to shed light on the following questions:

(1) How does GPR impact the cash holdings policy behaviour Saudi Banks?

(2) How does internal control impact on relation between GPR and CH in Saudi Banks?

Furthermore, the current study's goals are to 1) find out how GPR and CH are related; 2) find out how IC and CH are related; and 3) find out how the internal control index affects the relationship between GPR and the amount of cash held in Saudi banks. The current scientific study is considered an extension of a series of accounting literature that explored the relationship between geopolitical risks and cash holding. The most significant distinction from previous literature lies in the inclusion of an internal control variable, which is based on the COSO framework. Additionally, the theoretical background offers a unique perspective for examining the impact of efficient internal controls on GPR and CH. Therefore, the current study serves as a catalyst for evaluating how effective internal controls improve cash holding and GPR management, a crucial task for several KSA banks.

From a practical standpoint, our study offers Saudi bank officials, market players, and enterprises useful information, as follows: for various reasons, the amount of cash held by businesses has steadily increased recently across all industries; enterprises maintain larger cash reserves for precautionary reasons during global volatility; the necessity to examine cash

holdings becomes even more urgent. Because it is crucial in influencing capital market dynamics and investment choices, the bank classifies geopolitical risk as part of the "uncertainty trinity" [30] along with economic and policy uncertainty. The current study also offers more profound insights into how business financing cash holding decisions are impacted by geopolitical threats. Specifically, it demonstrates how Saudi banks can manage geopolitical risk to a large degree by having high-quality internal controls. The remainder of the current study is organized as follows: the second part develops the hypothesis, the third part provides a description of the data and material, the fourth part displays the empirical design, and the fifth part presents the discussion and conclusions of the paper.

2. Related Literature and Hypothesis Development

According to Chang et al. [31] and Chowdhury et al. [32], cash holdings are a company's liquid assets that give management discretion over their spending. Businesses may keep cash for two reasons: agency problems and operational requirements. Cash holdings are important for a number of reasons, such as lowering transaction costs, lowering the risk of financial distress, and creating opportunities for projects with a positive net present value (NPV), especially for businesses that are having trouble getting outside funding [32, 33]. These justifications center on the transactional and proactive facets of money management, Saleh et al. [34], as well as King et al. [35] state that cash holdings by businesses may have a significant impact on Foreign direct investment (FDI) when corruption is present in the host nation. Higher cash could indicate that (multinational enterprises) MNEs have plenty of liquid assets up for grabs, as the extent of expropriation by dishonest host country officials may differ depending on their assessment of a foreign MNE's capacity to pay and cash availability.

Recent research indicates that organizations' cash holding practices may be influenced by institutional, legal, or regulatory considerations. Unionization, financial reporting rules [36], political uncertainties, laws protecting employees [37], and shareholder lawsuit rights, as well as depoliticization regulations [38], all have an effect on corporate cash holdings. One important aspect affecting cash reserves is managerial ownership [39], cash flow, corporate governance, financial constraints, gender diversity on the board, and crises [40]. In particular, a study by Athari [41] has been conducted in the framework of China to test the effect of governance settings and country risk on firms' cash holdings, where corporate governance is measured by factors such as board size, duration, independence, audit committee, auditor ratification, diversity, and staggered board. Additionally, cultural factors, political uncertainty, and global economic policy uncertainty are important factors in corporate governance [41]. Furthermore, [42, 43] revealed that financial market development plays a significant role in setting firms' cash holdings policy.

In addition to the factors already mentioned, various studies have shown that uncertainties in culture, Li et al. [44], economic policy [45, 46], politics [47], and global economic policy are significant factors that impact cash holdings policy. So, empirical studies have found that a number of macroeconomic and firm-specific factors have a significant impact on the business cash holdings, including corruption, social capital, policy uncertainty, and bank-appointed directors [48, 49]. These results demonstrate that businesses need liquidity to protect themselves from external regulatory risks and to guarantee that they can make worthwhile investments in the future [50, 51].

In line with the above review, the majority of empirical research showed that three significant theoretical frameworks, including the trade-off model, the pecking order model, and the free cash flow model, elucidate the determinants of cash holdings [52, 53]. Furthermore, [54] discussion of precautionary, transaction cost, and agency motives offered a thorough foundation for comprehending the entire cash-to-assets ratios. As to Athari et al. [52], the trade-off model identifies two primary trade-off motives: transaction costs and precautionary motives. Companies can address their financial shortfalls by decreasing dividends, issuing new debt and stock, and liquidating existing assets, according to a study [49] that precautionary motive, businesses save money to cover unforeseen expenses in the event that they require expensive outside funding. As well as the trade-off model posits that firms establish an optimal cash holding level when the marginal gains of cash accumulation equal the marginal costs. In contrast to the trade-off model, the pecking order model posits that there is no optimal level of cash reserves [53].

According to the speculative motivation, businesses keep cash on hand to capitalize on potentially profitable situations; nevertheless, storing huge amounts of cash has a cost in the form of missed opportunities to invest in more productive assets. Since corporate managers can more easily use cash for value-reducing initiatives than other assets at the expense of shareholders, retaining too much cash raises agency costs [49]. Companies adhere to a funding hierarchy to mitigate the expenses associated with the knowledge asymmetry issue between insiders and outsiders. Companies endeavor to reduce asymmetric information costs by prioritizing internal finance, followed by debt financing, and resorting to equity financing as a final option. The pecking order hypothesis elucidates cash-holding decisions, particularly in underdeveloped nations where information asymmetry costs are comparatively elevated [52, 53]. In environments characterized by inadequate governance, agency expenses escalate, external financing becomes more expensive, and executives are incentivized to accumulate surplus funds for personal gain [55].

Due to a lack of confidence in the prospects for the global economy, the recent COVID-19 issue has made financial markets more unpredictable [56]. Accordingly, some research has concentrated on examining how economic uncertainty affects financial market behaviors [52] and how various proxies affect uncertainty [57] for example, examined how EPU affected the volatility of the Standard & Poor's (S&P) 500 economic sectors and discovered that the COVID-19 pandemic made all equities sectors more volatile. The negative impact of COVID-19 fatalities on the S&P sectors during the initial wave was emphasized by Matos et al. [58]. According to Siddique et al. [59], during the COVID-19 pandemic, gold, Bitcoin, and green bonds showed the weakest correlation with equity markets. According to recent research by Athari and Hung [60], COVID-19 strengthened the comovement between different asset classes. Using the wavelet coherence method, Athari et al.

[61] examine the co-movement between US energy stocks and the Twitter-based economic uncertainty index (TEU). The findings show a uniformly negative co-movement between the TEU and energy stocks, suggesting that rising TEU causes energy stock values to fall. According to recent research, the profitability of banks can be largely explained by both domestic and international risk variables [62]. Nonetheless, the findings imply that larger capital ratios are associated with lower political risk.

2.1. Hypotheses Development

Even though they were extremely important, negative geopolitical risk events were rare until recently and mostly happened in a small number of nations. Since then, a number of geopolitical tensions like the trade war between the United States and China have made headlines, changing the picture. Global CEOs now consider geopolitical risk to be one of the most significant business-related risks [7]. According to Wang et al. [63] a number of GPE have surfaced on the global scene, fostering an environment of ambiguity and instability. In KSA, a rising economy where these kinds of uncertainties are more significant, in this context [64] uses the geopolitical fluctuations on the Korean Peninsula to show that geopolitical uncertainty has a detrimental effect on foreign capital inflows, bond yields, currency value, and productivity. Where survey data shows that geopolitical shocks change strategic investments, and GPR has recently become a significant factor in corporate strategy [65]. So, the study [66] investigates whether and how external funding sensitivity to internal cash flows is affected by EPU and GPR.

Several studies state to GPR impacts firm-level decisions such as capital investment, innovation, and mergers & acquisitions [67] debt financing costs rise in tandem with the risk premium as GPR rises [15] raising the volatility of the financial market [68, 69] the cost of ownership, information asymmetries among companies and banks [70, 71] capital transfer to other stable markets [30], and asset returns[72]. Furthermore, [73] argue that increased geopolitical risk reduces stock liquidity due to the anticipation and threat of GP confrontations. As research developed, it started to address more complex subjects like how pandemic risk affects cash holdings [74] and how geopolitical worries affect cash holdings [75].

When debt financing is not enough to meet a company's capital needs, cash on hand is also beneficial. Additionally, it is better than cutting dividends and discretionary spending as well as liquidating assets, which are not immediate, give the markets bad signals, and endanger future growth. As a result, when GPR is higher, businesses are more likely to keep up their existing operations and investments while also increasing their cash reserves as a safety net against monetary limitations. Since firm equities are expensive, can't meet firms' immediate demands, cash financing is a more profitable and practical choice than equity financing, which is likely to be underpriced by investors due to a lack of information [51]. The literature looked at how businesses modify their cash management plans in reaction to different economic situations. Significantly, a growing corpus of research [54] has examined the impact of GPR on CH, which are a crucial component of corporate financial decision-making. So, GPR has a detrimental effect on hospitality companies' cash holdings. During the 2008 financial crisis, reduced interest rates encouraged businesses to temporarily reduce their debt while maintaining larger cash levels [38]. Also, uncertainty brought on by negative geopolitical events is associated with a steep drop in output, sales volume, or productivity, according to both empirical and theoretical evidence.

Aksoy-Hazır and Tan [75] and Cho [76] further demonstrates that as the GPR increases, businesses prefer to keep more cash on hand for precautionary reasons, and GPR has a favorable impact on Turkish corporations' cash holdings. In this line According to Wang, et al. [77] companies purposefully increase dividend payouts while decreasing cash flow from financing activities when geopolitical risk increases in order to allay agency concerns. In the framework of the study by Athari and Bahreini [78], the focus is on the impact of Economic Policy Uncertainty (EPU) on debt holdings. The findings indicate that, with the exception of profitability, capital intensity, intangible assets, effective tax rates, growth possibilities, and size exert a positive influence on the debt holdings of enterprises in operation. Furthermore, results indicate the EPU exerts the most significant adverse impact on the debt ratios of enterprises in the hospitality, travel, tourist, and recreational services industries. There are two potential theoretical reasons for how GPR affects cash holdings. First, GPR exacerbates information asymmetry, makes it harder to obtain outside funding, and raises the cost of outside funding, all of which put further financial limitations on businesses. For preventive reasons, as a safeguard against monetary limitations, and to continue their current operations and investments during times of high GPR. Second, according to the real options theory, businesses are more likely to delay corporate expenditures during high GPR times in order to save greater cash reserves for future investment financing when GPR declines [79]. According to earlier research, corporate investments and GPR have a negative relationship [14], which could result in higher cash holdings.

So, we can formulate the first hypothesis as follows:

H_1: Geopolitical risks positively affect cash holdings in Saudi banks.

Agency theory explains the relationship between the principal and the agent, but occasionally the agent does not follow the principal's instructions and puts his own interests ahead of the principal's, which results in an agency problem. An effective internal control system may lessen the manager's ability to expropriate the firm's value. Managers are free to use monetary assets however they see fit, and since cash is readily available, they may do so for their personal gain. Effective internal control, then, safeguards financial resources and prevents managers from using them for their own gain. Therefore, a number of studies have attempted to examine the relationship between internal control and cash holdings [80]. Propose that inadequate internal control over financial reporting lowers the accuracy of financial information, giving managers the chance to embezzle cash flows. According to Acharya et al. [81], in particular, internal business limitations can stop financial flows from being diverted and misused. To make sure that internal controls provide limitations on management, PCAOB (AS .5) mandates that external auditors examine potential management override of control systems. On the other hand, a bad corporate culture, which includes a lack of moral principles and integrity as well as insufficient control measures, makes it

easier for upper management to waste company funds [82]. According to Cheng et al. [83], weak ICFR enterprises are more prone than their peers without significant internal control problems to engage in empire-building and underinvestment.

Additionally, opportunistic insider trading, which is a kind of managerial rent extraction, is facilitated by a lack of oversight over financial reporting [84]. Cash holdings are more valuable for companies that disclose substantial deficiencies in the Sarbanes-Oxley (SOX) 404 internal control examinations, according to[85]. According to the study, for every additional dollar of cash, the value differential between companies with weak controls and those with effective controls is roughly $0.25. Furthermore, fixing previously identified material flaws considerably lessens the financial impact of cash resources. In contrast, [86] investigate how regulations affect the reporting of internal control quality and the connection between corporate cash holdings and equity market value. Regression study results show that the association between cash holdings and equity market value is significantly improved by rules requiring reporting on the strength of internal controls. The effectiveness of internal control could prevent overinvestment and lower agency costs, allowing the company to use its cash on hand more effectively in the face of future uncertainty. In addition to improving the accuracy and integrity of the data, internal control could boost the effectiveness of business operations [87, 88].

An organization's exposure to risks can be recognized, evaluated, and reduced with the aid of internal control. This is crucial in an uncertain business climate because it enables the company to foresee possible problems and take action to lessen their effects. The correctness and integrity of financial and operational data are guaranteed by efficient IC. Fraud and fraudulent activity are less likely to occur when there is a robust internal control mechanism in place. The danger of asset theft and false reporting is decreased by putting in place appropriate control mechanisms [89]. According to [26]. Because management appropriately weighs the benefits and drawbacks associated with more or less cash and implements suitable cash policies, companies with effective IC typically have low cash levels. When deciding how much cash to hold, managers at companies with strong controls and a clear knowledge of risk weigh risks against returns [26]. Additional cash on hand can be utilized to pay for cash demands from prospective future investments or for other preventative measures [47]. Furthermore, cash reserves could provide low-cost borrowing, which would reduce future GRP. Given the difficulties they encounter with securing outside capital during GPR, this is normal for enterprises.

Prior studies have provided insight into the fact that inaccurate and deceptive internal reporting can lead to cash resource misallocations. As a result, a weak internal control system lowers the expected value of cash for investors and increases the risk of management misusing company cash holdings. Conversely, effective internal control can limit managers' ability to exploit private benefits associated with cash. The COSO framework was developed by the Treadway Commission's Committee of Sponsoring Organizations and consists of five interconnected components (Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring) that help organizations achieve their internal control objectives [87]. From the standpoint of the control environment, for instance, a strong "tone at the top" can promote appropriate corporate culture and moral principles that support the protection of financial resources. Internal checks and balances offer prompt prevention and detection of cash asset misuse from the standpoint of control activities [82]. According to accounting theory, internal control is a process that is impacted by management information systems, people, authority, workflow, organizational structure, and other elements that are intended to assist organizations in achieving specific goals or objectives. In order to identify fraud and safeguard organizational resources, it is also necessary to measure and monitor them regularly [90]. These elements function to lay the groundwork for sufficient internal control in the business. Along with organization, internal control is used to ensure that financial reports are released with credibility, that corporate management is effective and efficient, and that current rules and regulations are followed [26]. By providing certain controls and procedures that strengthen organizational resilience and accountability, each component has an impact on these goals [26, 88].

According to Chan et al. [26], companies with greater IC have a comprehensive set of risk management procedures, especially GPR, including methods and instruments for risk assessment, response to risk, threat finding, and scientific risk management. A good control environment involves a well-structured governance structure and skilled staff to ensure that the company conducts accurate risk assessments and properly implements the required oversight processes [91]. To identify, address, and solve any errors in risk management initiative design or execution, a timely monitoring system with a successful interaction method is implemented [92, 93]. Because they effectively evaluate GPR, the costs and advantages of retaining more or less cash, and adopt cash policies, these firms with greater IC are less likely to have abnormal cash reserves or cash deficits.

2.2. The Following Related Hypotheses are Therefore Proposed

H_2: Internal control has a positive effect on cash holdings in Saudi banks.

H_3: The internal control index supports the relationship between GPR and cash holdings in Saudi banks.

3. Data and Material

As a financial intermediary, the banking system is the most important component of any economy, and the functioning of the banking industry is crucial to economic expansion. According to earlier studies, a more stable and prosperous banking sector plays a significant role in enhancing the stability of the financial system [62]. Thus, this relationship holds true in Saudi banks, where banks are crucial to economic expansion. As a result, the researcher is interested in geopolitical risk and cash holdings in Saudi banks. A number of issues, such as market uncertainty, government and family ownership, and information asymmetry, cause Saudi Arabia's institutional and regulatory environment to differ from that of advanced economies [94, 95]. Since the introduction of Vision 2030, which has encouraged asset management, institutional investment development, and internal control, the Saudi equities market has become more accessible to foreign investors. Therefore,

Saudi Arabia is an interesting and important market to study, especially concerning internal control and cash holdings. Consequently, the unique institutional, legal, and market environment of Saudi Arabia makes it an ideal site for scholarly study on GPR, CH, and internal control.

The current study is based on secondary data for Saudi banks listed on the stock market, covering the period from 2010 to 2023. The choice of this time frame considers the geopolitical tensions surrounding the Arab region in general and Saudi Arabia in particular, which began in 2010 with the outbreak of the Arab Spring revolutions. It is evident that the number of banks on the Saudi Stock Exchange is 37, according to https://www.sama.gov.sa/ar-sa/LicenseEntities/Pages/LicensedBanks.aspx, resulting in 370 firm-year observations during the study period. After excluding outliers and extreme values, totaling 36 observations, the final sample comprises 334 firm-year observations.

3.1. Variables and Measurements

1. *Cash holding:* Cash holding represents the dependent variable of this research and can be measured depending on Megginson et al. [96], where the cash holding is the ratio of cash and its equivalents to all non-cash assets. In this regard, cash holding expresses the level of liquidity in the firm and the possibility of relying on it to finance investments.
2. *Geopolitical risk:* The lack of appropriate geopolitical risk measures has hindered the advancement of empirical studies. However, the GPR index, developed by Caldara & Iacoviello, is a useful tool in this field. The percentage of articles in major English newspapers that discuss global events affecting deterrence is determined via text searches. The key independent variable is the GPR index, which is calculated by Caldara and Iacoviello [97] to represent the natural logarithms of GPR, GPR_THREAT, GPR_ACT, GPR_BROAD, and GPR_NARROW.
3. *Internal Control:* Chen et al. [98] employs the AHP to examine more than 100 aspects across five COSO components: (CtrEnv, Risk Assess, CtrAct, InfoCom, Monitor). SOX 404 focuses solely on financial reporting, while the Index also addresses operations, compliance, and asset protection. As a result, we use the COSO-based Index developed by Chen et al. [98] to assess internal control quality.
4. *Control Variables:* Prior research has established variables such as total dividends payments, total annual sales growth, short-term debt to the book value of total assets, pre-tax income plus depreciation ratio, and capital expenditure ratio as significant predictors of cash holding. We choose and measure firm-level controls in accordance with existing research. Particularly, we control for all company variables that are expected to influence cash holding levels. The research variables can be summarized through Table 1:

Table 1.
Variable definition.

Variables	Abbreviation	Definition
Cash holding	CH	Cash and cash equivalents to the book value of total assets
Geopolitical risk threats	GPR_THREAT	Log the Annual Average of GPR Threat
Geopolitical risk ACT	GPR_ACT	Log the Annual Average of GPR Act
Geopolitical risk Broad	GPR_BROAD	Log the Annual Average of GPR Broad
Geopolitical risk Narrow	GPR_NARROW	Log the Annual Average of GPR Narrow
Total Geopolitical Risk	GPR	Log the Annual Average of overall GPR
Control environment	CtrEnv (IC1)	Log score for the (Control environment)
Risk Assessment	RiskAssess (IC2)	Log score for the (Risk Assessment)
Control Activities	CtrAct (IC3)	Log score (Control Activities)
Information and Communication	InfoCom (IC4)	Log score (Information and Communication)
Monitoring	Monitor (IC5)	Log score for the fifth component of internal control index (Monitoring)
Total internal control quality	TICQ	Log score for the total internal control index
Dividends payments	DIV	Total dividend payments to the book value of total assets
Short-term debt ratio	STD	Short-term debt in relation to the book value of total assets
Pre-tax income plus depreciation ratio	CF	Pre-tax income + depreciation to the book value of total assets
Capital expenditure ratio	CAPEX	Capital expenditure to the book value of total assets
sales growth	SG	change in Total annual sales to the book value of total assets

3.2. Empirical models

H1 predicts the effect of GPR (THREAT. ACT .BROAD .NARROW) on the CH level; consequently the results of equations from (1) to (5) as follows:

$$CH = \alpha + \beta1\ GPR\_THREAT + \beta2\ DIV + \beta3\ STD + \beta4\ CF + \beta5\ CAPEX + \beta6\ SG + \varepsilon \quad (1)$$

$$CH = \alpha + \beta1\ GPR\_ACT + \beta2\ DIV + \beta3\ STD + \beta4\ CF + \beta5\ CAPEX + \beta6\ SG + \varepsilon \quad (2)$$

$$CH = \alpha + \beta1\ GPR\_BROAD + \beta2\ DIV + \beta3\ STD + \beta4\ CF + \beta5\ CAPEX + \beta6\ SG + \varepsilon \quad (3)$$

$$CH = \alpha + \beta1\ GPR\_NARROW + \beta2\ DIV + \beta3\ STD + \beta4\ CF + \beta5\ CAPEX + \beta6\ SG + \varepsilon \quad (4)$$

$$CH = \alpha + \beta1\ GPR + \beta2\ DIV + \beta3\ STD + \beta4\ CF + \beta5\ CAPEX + \beta6\ SG + \varepsilon \quad (5)$$

H2, in another vein, the relationship between the IC and the CH level can be tested through the equations from (6) to (11) as follows:

$$CH = \alpha + \beta 1\ CtrEnv\ (IC1) + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (6)$$
$$CH = \alpha + \beta 1\ RiskAssess\ (IC2) + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (7)$$
$$CH = \alpha + \beta 1\ CtrAct\ (IC3) + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (8)$$
$$CH = \alpha + \beta 1\ InfoCom\ (IC4) + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (9)$$
$$CH = \alpha + \beta 1\ Monitor\ (IC5) + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (10)$$
$$CH = \alpha + \beta 1\ TICQ + \beta 2\ DIV + \beta 3\ STD + \beta 4\ CF + \beta 5\ CAPEX + \beta 6\ SG + \varepsilon \quad (11)$$

Moreover, H3 Predicts the Moderate role of IC index in relation between GPR & CH can represent in the following relationship:

The relationship between the interaction of internal control index with GPR_THREAT and the cash holding can be tested from the Equation (12 to 17) as follows:

$$CH = \alpha + \beta 1\ GPR\_THREAT \times IC1 + \beta 2\ GPR\_THREAT + \beta 3\ IC1 + \beta n\ Controls + \varepsilon \quad (12)$$
$$CH = \alpha + \beta 1\ GPR\_THREAT \times IC2 + \beta 2\ GPR\_THREAT + \beta 3\ IC2 + \beta n\ Controls + \varepsilon \quad (13)$$
$$CH = \alpha + \beta 1\ GPR\_THREAT \times IC3 + \beta 2\ GPR\_THREAT + \beta 3\ IC3 + \beta n\ Controls + \varepsilon \quad (14)$$
$$CH = \alpha + \beta 1\ GPR\_THREAT \times IC4 + \beta 2\ GPR\_THREAT + \beta 3\ IC4 + \beta n\ Controls + \varepsilon \quad (15)$$
$$CH = \alpha + \beta 1\ GPR\_THREAT \times IC5 + \beta 2\ GPR\_THREAT + \beta 3\ IC5 + \beta n\ Controls + \varepsilon \quad (16)$$
$$CH = \alpha + \beta 1\ GPR\_THREAT \times TICQ + \beta 2\ GPR\_THREAT + \beta 3\ TICQ + \beta n\ Controls + \varepsilon \quad (17)$$

In addition, the relationship between the interaction of internal control index with GPR_ACT and the cash holding can be tested from the Equation (18 to 23) as follows:

$$CH = \alpha + \beta 1\ GPR\_ACT \times IC1 + \beta 2\ GPR\_ ACT + \beta 3\ IC1 + \beta n\ Controls + \varepsilon \quad (18)$$
$$CH = \alpha + \beta 1\ GPR\_ ACT \times IC2 + \beta 2\ GPR\_ ACT + \beta 3\ IC2 + \beta n\ Controls + \varepsilon \quad (19)$$
$$CH = \alpha + \beta 1\ GPR\_ ACT \times IC3 + \beta 2\ GPR\_ ACT + \beta 3\ IC3 + \beta n\ Controls + \varepsilon \quad (20)$$
$$CH = \alpha + \beta 1\ GPR\_ ACT \times IC4 + \beta 2\ GPR\_ ACT + \beta 3\ IC4 + \beta n\ Controls + \varepsilon \quad (21)$$
$$CH = \alpha + \beta 1\ GPR\_ ACT \times IC5 + \beta 2\ GPR\_ ACT + \beta 3\ IC5 + \beta n\ Controls + \varepsilon \quad (22)$$
$$CH = \alpha + \beta 1\ GPR\_ ACT \times TICQ + \beta 2\ GPR\_ ACT + \beta 3\ TICQ + \beta n\ Controls + \varepsilon \quad (23)$$

The relationship between the interaction of internal control index with GPR_BROAD and the cash holding can be tested from the Equation (24 to 29) as follows:

$$CH = \alpha + \beta 1\ GPR\_BROAD \times IC1 + \beta 2\ GPR\_ BROAD + \beta 3\ IC1 + \beta n\ Controls + \varepsilon \quad (24)$$
$$CH = \alpha + \beta 1\ GPR\_ BROAD \times IC2 + \beta 2\ GPR\_ BROAD + \beta 3\ IC2 + \beta n\ Controls + \varepsilon \quad (25)$$
$$CH = \alpha + \beta 1\ GPR\_ BROAD \times IC3 + \beta 2\ GPR\_ BROAD + \beta 3\ IC3 + \beta n\ Controls + \varepsilon \quad (26)$$
$$CH = \alpha + \beta 1\ GPR\_ BROAD \times IC4 + \beta 2\ GPR\_ BROAD + \beta 3\ IC4 + \beta n\ Controls + \varepsilon \quad (27)$$
$$CH = \alpha + \beta 1\ GPR\_ BROAD \times IC5 + \beta 2\ GPR\_ BROAD + \beta 3\ IC5 + \beta n\ Controls + \varepsilon \quad (28)$$
$$CH = \alpha + \beta 1\ GPR\_ BROAD \times TICQ + \beta 2\ GPR\_ BROAD + \beta 3\ TICQ + \beta n\ Controls + \varepsilon \quad (29)$$

Moreover, the relationship between the interaction of internal control index with GPR_NARROW and the cash holding can be tested from the Equation (30 to 35) as follows:

$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC1) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC1) + \beta n\ Controls + \varepsilon \quad (30)$$
$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC2) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC2) + \beta n\ Controls + \varepsilon \quad (31)$$
$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC3) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC3) + \beta n\ Controls + \varepsilon \quad (32)$$

$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC4) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC4) + \beta n\ Controls + \varepsilon \quad (33)$$
$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC5) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC5) + \beta n\ Controls + \varepsilon \quad (34)$$
$$CH = \alpha + \beta 1\ GPR\_ NARROW \times (IC5) + \beta 2\ GPR\_ NARROW + \beta 3\ (IC5) + \beta n\ Controls + \varepsilon \quad (35)$$

Finally, the relationship between the interaction of the internal control index with GPR and cash holdings can be tested using Equations (36) to (41) as follows:

$$CH = \alpha + \beta 1\ GPR \times (IC1) + \beta 2\ GPR + \beta 3\ (IC1) + \beta n\ Controls + \varepsilon \quad (36)$$
$$CH = \alpha + \beta 1\ GPR \times (IC2) + \beta 2\ GPR + \beta 3\ (IC2) + \beta n\ Controls + \varepsilon \quad (37)$$
$$CH = \alpha + \beta 1\ GPR \times (IC3) + \beta 2\ GPR + \beta 3\ (IC3) + \beta n\ Controls + \varepsilon \quad (38)$$
$$CH = \alpha + \beta 1\ GPR \times (IC4) + \beta 2\ GPR + \beta 3\ (IC4) + \beta n\ Controls + \varepsilon \quad (39)$$
$$CH = \alpha + \beta 1\ GPR \times (IC5) + \beta 2\ GPR + \beta 3\ (IC5) + \beta n\ Controls + \varepsilon \quad (40)$$
$$CH = \alpha + \beta 1\ GPR \times TICQ + \beta 2\ GPR + \beta 3\ TICQ + \beta n\ Controls + \varepsilon \quad (41)$$

4. Empirical Results

4.1. Stationary Tests

4.1.1. Dickey-Fuller Test (ADF) For Testing Unit Root

The null hypothesis that a unit root exists in a time series sample is assessed by the augmented Dickey–Fuller test (ADF). The hypothesis that unit roots exist at a certain confidence level is more strongly rejected when the negativity is higher. Thus, the following Table 2 displays the test's (ADF) results:

Table 2.
Dickey-Fuller test (ADF) Results.

Variable	Test Stat.	P-Value	Critical Value (1%)	Critical Value (5%)	Critical Value (10%)
CH	-18.197	0.000	-3.988	-3.428	-3.130
GPR_THREAT	-17.863	0.000	-3.988	-3.428	-3.130
GPR_ACT	-14.340	0.000	-3.988	-3.428	-3.130
GPR_BROAD	-15.776	0.000	-3.988	-3.428	-3.130
GPR_NARROW	-15.815	0.000	-3.988	-3.428	-3.130
GPR	-17.869	0.000	-3.988	-3.428	-3.130
CtrEnv (IC1)	-15.234	0.000	-3.988	-3.428	-3.130
RiskAssess (IC2)	-17.993	0.000	-3.988	-3.428	-3.130
CtrAct (IC3)	-16.528	0.000	-3.988	-3.428	-3.130
InfoCom (IC4)	-15.649	0.000	-3.988	-3.428	-3.130
Monitor (IC5)	-14.486	0.000	-3.988	-3.428	-3.130
TICQ	-16.269	0.000	-3.988	-3.428	-3.130
DIV	-17.207	0.000	-3.988	-3.428	-3.130
STD	-17.393	0.000	-3.988	-3.428	-3.130
CF	-18.448	0.000	-3.988	-3.428	-3.130
CAPEX	-13.732	0.000	-3.988	-3.428	-3.130
SG	-15.356	0.000	-3.988	-3.428	-3.130

According to the aforementioned findings, all variables' test statistics were higher than the critical value at all confidence levels. Therefore, the current study can accept the alternative hypotheses, which show that the outcomes vary slightly depending on the equation used. The time series being stationary (or trend-stationary) is the fundamental alternative.

4.1.2. Granger Causality Test

Rather than testing whether X causes Y, the Granger causality test determines whether X forecasts Y. In this research, the Granger causality test can be summarized in the following Table 3.

Table 3.
Granger Causality Test results.

	chi2	Prob > chi2
GPR_THREAT doesn't cause (IC1)	5.356	0.374
GPR_THREAT doesn't cause (IC2)	5.331	0.139
GPR_THREAT doesn't cause (IC3)	5.062	0.349
GPR_THREAT doesn't cause (IC4)	4.567	0.173
GPR_THREAT doesn't cause (IC5)	5.684	0.15
GPR_THREAT doesn't cause TICQ	5.088	0.298
GPR_ACT doesn't cause (IC1)	4.869	0.208
GPR_ACT doesn't cause (IC2)	4.738	0.156
GPR_ACT doesn't cause (IC3)	3.88	0.192
GPR_ACT doesn't cause (IC4)	4.844	0.164
GPR_ACT doesn't cause (IC5)	4.232	0.17
GPR_ACT doesn't cause TICQ	4.202	0.28
GPR_BROAD doesn't cause (IC1)	5.844	0.218
GPR_BROAD doesn't cause (IC2)	5.561	0.241
GPR_BROAD doesn't cause (IC3)	3.876	0.356
GPR_BROAD doesn't cause (IC4)	5.006	0.216
GPR_BROAD doesn't cause (IC5)	3.987	0.291
GPR_BROAD doesn't cause TICQ	5.289	0.182
GPR_NARROW doesn't cause (IC1)	4.254	0.302
GPR_NARROW doesn't cause (IC2)	3.709	0.23
GPR_NARROW doesn't cause (IC3)	4.816	0.38
GPR_NARROW doesn't cause (IC4)	3.959	0.284
GPR_NARROW doesn't cause (IC5)	4.432	0.333
GPR_NARROW doesn't cause TICQ	4.048	0.151
GPR doesn't cause (IC1)	5.774	0.364
GPR doesn't cause (IC2)	3.754	0.214
GPR doesn't cause (IC3)	5.854	0.356
GPR doesn't cause (IC4)	5.545	0.294
GPR doesn't cause (IC5)	5.54	0.286
GPR doesn't cause TICQ	4.486	0.386

Table 3 shows the Granger causality test to study the direction of the relationship between the GPR_THREAT and all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ and the results showed that the null hypothesis that GPR_THREAT as one component of geopolitical risk disclosure doesn't cause all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ was accepted, as the test's significance reached 0.374, 0.139, 0.349, 0.173, 0.150 & 0.298, respectively which is greater than the 5% error level.

Besides, the Granger causality test to study the direction of the relationship between the GPR_Act and all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ and the results showed that the null hypothesis that GPR_Act as one component of geopolitical risk disclosure doesn't cause all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ was accepted, as the test's significance reached 0.208, 0.156, 0.192, 0.164, 0.170 & 0.280, respectively which is greater than the 5% error level.

Moreover, the Granger causality test to study the direction of the relationship between the GPR_BROAD and all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ and the results showed that the null hypothesis that GPR_ BROAD as one component of geopolitical risk disclosure doesn't cause all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ was accepted, as the test's significance reached 0.218, 0.241, 0.356, 0.216, 0.291 & 0.182, respectively which is greater than the 5% error level.

In addition, the Granger causality test to study the direction of the relationship between the GPR_NARROW and all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ and the results showed that the null hypothesis that GPR_NARROW as one component of geopolitical risk disclosure doesn't cause all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ was accepted, as the test's significance reached 0.302, 0.230, 0.380, 0.284, 0.333 & 0.151, respectively which is greater than the 5% error level.

Finally, the Granger causality test to study the direction of the relationship between the GPR and all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ and the results showed that the null hypothesis that GPR as one component of geopolitical risk disclosure doesn't cause all internal control components which are (IC1), (IC2), (IC3), (IC4), (IC5) & TICQ was accepted, as the test's significance reached 0.364, 0.214, 0.356, 0.294, 0.286 & 0.386, respectively which is greater than the 5% error level.

4.2. Summary Statistics

Table 4 shows that cash holding mean and median equal 0.101 and 0.061 respectively, in addition the means of geopolitical risk index are 4.696, 4.507, 4.298, 4.269 and 4.151 respectively for the subcomponents of geopolitical risk index, i.e. GPR_THREAT, GPR_ACT, GPR_BROAD, GPR_NARROW and GPR respectively , moreover the means of internal control index are 3.296, 3.540, 3.292, 3.591, 3.624 and 3.587 respectively for the subcomponents of internal control index, i.e. (CtrEnv, RiskAssess CtrAct, InfoCom ,Monitor)and total internal control index respectively .

Table 4.
Descriptive statistics of main variables.

Variables	Obs	Mean	Std. Dev.	Median	Q1	Q3
CH	334	0.101	0.097	0.061	0.022	0.148
GPR_THREAT	334	4.696	0.326	4.193	4.488	4.431
GPR_ACT	334	4.507	0.299	4.184	4.734	4.755
GPR_BROAD	334	4.298	0.324	4.657	4.211	4.149
GPR_NARROW	334	4.269	0.229	4.769	4.658	4.408
GPR	334	4.151	0.252	4.486	4.810	4.641
CtrEnv (IC1)	334	3.296	0.374	3.659	3.725	3.529
RiskAssess (IC2)	334	3.540	0.367	3.620	3.552	3.250
CtrAct (IC3)	334	3.292	0.219	3.683	3.564	3.207
InfoCom (IC4)	334	3.591	0.365	3.335	3.186	3.602
Monitor (IC5)	334	3.624	0.272	3.231	3.671	3.364
TICQ	334	3.587	0.398	3.688	3.653	3.507
DIV	334	0.032	0.048	0.011	0.010	0.037
STD	334	0.156	0.221	0.087	0.029	0.195
CF	334	0.076	0.188	0.070	0.015	0.166
CAPEX	334	0.058	0.075	0.035	0.014	0.069
SG	334	0.554	0.522	0.615	0.471	0.875

Table 5.
Correlation Matrix.

	Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	VIF
(1)	CH	1																	---
(2)	GPR_ THREAT	0.187***	1																1.152
(3)	GPR_ ACT	0.195***	0.205***	1															1.618
(4)	GPR_ BROAD	0.196***	0.197***	0.171***	1														1.725
(5)	GPR_ NARROW	0.217***	0.185***	0.195***	0.161***	1													1.236
(6)	GPR	0.225***	0.174***	0.218***	0.175***	0.188***	1												1.337
(7)	CtrEnv (IC1)	0.226***	0.043	0.095**	0.036	0.099**	0.046	1											1.821
(8)	RiskAssess (IC2)	0.218***	0.036	0.097**	0.096**	0.086*	0.096**	0.188***	1										1.436
(9)	CtrAct (IC3)	0.245***	0.088**	0.068*	0.056	0.072*	0.091**	0.176***	0.196***	1									1.568
(10)	InfoCom (IC4)	0.236***	0.056	0.041	0.061*	0.075*	0.093**	0.195***	0.226***	0.193***	1								1.781
(11)	Monitor (IC5)	0.205***	0.050	0.094	0.046	0.052	0.035	0.205***	0.218***	0.178***	0.236***	1							1.095
(12)	TICQ	0.187***	0.070*	0.079*	0.070*	0.069*	0.092**	0.210***	0.175***	0.216***	0.215***	0.178***	1						2.177
(13)	DIV	-0.054*	-0.064*	-0.075*	-0.048	-0.064*	-0.056	-0.093**	0.049	0.069	0.086**	0.068*	0.064*	1					1.311
(14)	STD	-0.094**	-0.090**	-0.089**	-0.045	-0.037	-0.075*	-0.07	-0.083**	-0.035	-0.042	-0.082**	-0.074*	-0.066*	1				1.087
(15)	CF	0.089**	0.091**	0.062*	0.037	0.053	0.038	0.088**	0.042	0.059	0.087**	0.054	0.081**	0.050	0.086**	1			0.985
(16)	CAPEX	-0.071*	-0.076*	-0.066*	-0.036	-0.046	-0.044	-0.081**	-0.077*	-0.077*	-0.046	-0.090**	-0.039	-0.054	-0.068*	0.042	1		0.987
(17)	SG	-0.083**	0.088**	0.081**	0.069*	0.078*	0.083**	0.035	0.079*	0.072*	0.051	0.079*	0.035	0.057	0.050	0.041	0.037	1	1.036

Note: *, **, *** denote significance levels at 10%, 5%, 1% respectively.

4.3. Correlation Matrix:

Table 5 represents the relationships among the main research variables, where the results indicate a positive significant relationship between the geopolitical risk index and the cash holding level. An increase in the geopolitical risk index suggests that surrounding risks are very high, requiring firms to hold more cash and decrease their investment levels. Similarly, the internal control index shows a positive relationship; an increase in the internal control index leads to higher cash holdings, as internal control encourages holding more cash to face potential crises. Consequently, investment levels tend to be at their lowest in this case.

4.4. Baseline results

H1 predicts the effect of GPR (THREAT, ACT, BROAD, NARROW) on the CH level; consequently, the results of equations from (1) to (5). Table 6 shows that geopolitical risk has a positive significant effect on the cash holding level. Columns no. (1, 2, 3, 4) reflect the significant positive effect of (GPR_THREAT, GPR_ACT, GPR_BROAD, GPR_NARROW) on cash holding level. Finally, column (5) confirms that GPR has a positive significant impact on the CH.

Table 6.
GPR & CH.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
GPR_THREAT	0.0685***				
	(3.535)				
GPR_ACT		0.0697***			
		(3.476)			
GPR_BROAD			0.0691***		
			(4.083)		
GPR_NARROW				0.0688***	
				(2.857)	
GPR					0.0575***
					(3.327)
DIV	-0.425***	-0.436***	-0.416***	-0.418***	-0.415***
	(-2.621)	(-2.715)	(-2.763)	(-2.721)	(-2.712)
STD	-0.418***	-0.420***	-0.395***	-0.432***	-0.436***
	(-2.736)	(-2.815)	(-2.625)	(-2.768)	(-2.795)
CF	0.223	0.182	0.208	0.205	0.191
	(1.186)	(0.946)	(0.947)	(1.204)	(0.969)
CAPEX	0.200	0.218	0.223	0.184	0.216
	(0.957)	(0.992)	(1.086)	(1.188)	(1.120)
SG	0.194	0.216	0.219	0.211	0.216
	(1.001)	(0.933)	(1.198)	(1.120)	(0.964)
Constant	0.222	0.218	0.203	0.219	0.216
	(1.076)	(1.211)	(1.150)	(0.961)	(0.987)
Observations	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000
R-squared	0.266	0.205	0.248	0.197	0.244

In this regard the first hypothesis can be accepted in the alternative form where:

$H_{1:}$ Geopolitical risks positively affect cash holdings in Saudi banks.

These results mean that increasing geopolitical risk leads to holding more cash to avoid probable risks in the surrounding environment, and these results are consistent with the studies [77].

In another vein, the relationship between the IC and CH levels can be tested through the equations from (6) to (11). Table 7 shows that the internal control index has a positive significant effect on the cash holding level. Columns no. (6,7,8,9,10,11) reflect the significant positive effect of control environment, risk assessment, control activities, information and communication, and monitoring on the cash holding level. Finally, column (11) confirms that the total internal control index has a positive significant impact on the CH.

Table 7.
IC & CH.

Variables	(6)	(7)	(8)	(9)	(10)	(11)
CtrEnv (IC1)	0.0618***					
	(3.157)					
RiskAssess (IC2)		0.0587***				
		(3.657)				
CtrAct (IC3)			0.0526***			
			(3.521)			
InfoCom (IC4)				0.0563***		
				(2.926)		
Monitor (IC5)					0.0557***	
					(3.681)	
TICQ						0.0621***
						(3.396)
DIV	-0.415***	-0.451***	-0.486***	-0.427***	-0.505***	-0.406***
	(-2.763)	(-2.742)	(-2.911)	(-2.821)	(-2.705)	(-2.713)
STD	-0.427***	-0.385***	-0.405***	-0.455***	-0.407***	-0.385***
	(-2.805)	(-2.806)	(-2.718)	(-2.625)	(-2.635)	(-2.805)
CF	0.196	0.238	0.217	0.198	0.218	0.201
	(0.914)	(0.990)	(1.036)	(0.970)	(0.952)	(0.967)
CAPEX	0.228	0.223	0.231	0.205	0.218	0.202
	(1.105)	(1.077)	(1.111)	(1.019)	(1.003)	(1.161)
SG	0.194	0.235	0.193	0.187	0.210	0.212
	(1.021)	(1.030)	(1.206)	(1.222)	(0.979)	(0.996)
Constant	0.200	0.237	0.186	0.228	0.214	0.184
	(1.039)	(1.088)	(1.157)	(1.125)	(1.070)	(1.208)
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.262	0.235	0.218	0.219	0.195	0.248

In this regard, the second hypothesis can be accepted in the alternative form where:
$H_{2:}$ Internal control has a positive effect on cash holdings in Saudi banks

These findings imply that raising the internal control index results in holding more cash in order to mitigate the likely risks in the surrounding environment. Internal control may have an impact on the amount of cash held, and the effects would become more apparent as relationship trades increase in frequency and information becomes more asymmetrical. Additionally, there is improved IC and higher-quality business information, and the negative effects of trading in closely related relationships will also decrease. Corporate CH may be somewhat reduced in the meantime by the improvement of internal control and investor protection [87, 88].

Moreover, the represented results in Table 8 ensure that the interaction between the GPR components and the IC index has a significant positive effect on cash holdings, i.e., the internal control index supports the original relationship between GPR_THREAT and cash holdings.

Table 8.
Moderate role of IC index in relation between GPR_THREAT & CH.

Variables	(12)	(13)	(14)	(15)	(16)	(17)
GPR_THREAT × CtrEnv (IC1)	0.0544***					
	(3.507)					
GPR_THREAT × RiskAssess (IC2)		0.0608***				
		(2.553)				
GPR_THREAT × CtrAct (IC3)			0.054***			
			(3.090)			
GPR_THREAT × InfoCom (IC4)				0.0558***		
				(2.716)		
GPR_THREAT × Monitor (IC5)					0.0528***	
					(3.208)	
GPR_THREAT × TICQ						0.0549***
						(3.617)
GPR_THREAT	0.0554***	0.0536***	0.0587***	0.0563***	0.0521***	0.0531***
	(2.687)	(2.621)	(2.815)	(2.861)	(2.412)	(2.527)

CtrEnv (IC1)	0.0621***					
	(3.005)					
CtrEnv (IC2)		0.0655***				
		(2.436)				
CtrEnv (IC3)			0.0671***			
			(2.825)			
CtrEnv (IC4)				0.0617***		
				(2.177)		
CtrEnv (IC5)					0.0618***	
					(2.151)	
TICQ						0.0626***
						(2.827)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.186	0.213	0.207	0.254	0.205	0.194

The presented results in Table 9 demonstrate that the interaction between GPR_ACT and the internal control index has a significant positive effect on cash holdings, i.e., the internal control index supports the original relationship between GPR_ACT and CH.

Table 9.
Moderate role of IC index in relation between GPR_ACT & CH.

Variables	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	**(23)**
GPR_ACT × CtrEnv (IC1)	0.0564***					
	(3.261)					
GPR_ACT × RiskAssess (IC2)		0.055***				
		(2.692)				
GPR_ACT × CtrAct (IC3)			0.0582***			
			(3.217)			
GPR_ACT × InfoCom (IC4)				0.0621***		
				(3.202)		
GPR_ACT × Monitor (IC5)					0.0549***	
					(2.890)	
GPR_ACT × TICQ						0.0547***
						(3.541)
GPR_ACT	0.0618***	0.0657***	0.0597***	0.0585***	0.0597***	0.0615***
	(3.511)	(2.955)	(2.341)	(2.425)	(2.618)	(2.827)
(IC1)	0.0537***					
	(2.921)					
(IC2)		0.0587***				
		(2.857)				
(IC3)			0.0592***			
			(3.151)			
(IC4)				0.0563***		
				(3.055)		
(IC5)					0.0571***	
					(2.041)	
TICQ						0.0578***
						(2.618)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.195	0.204	0.216	0.209	0.274	0.256

The represented results in Table 10 ensure that interaction between the GPR_BROAD and IC index has a significant positive effect on the cash holding, i.e., the IC index supported the origin relationship between the GPR_BROAD and CH.

Table 10.
Moderate role of IC index in relation between GPR_BROAD & CH.

Variables	**(24)**	**(25)**	**(26)**	**(27)**	**(28)**	**(29)**
GPR_BROAD × CtrEnv (IC1)	0.056***					
	(3.370)					
GPR_BROAD × RiskAssess (IC2)		0.0611***				
		(3.538)				
GPR_BROAD × CtrAct (IC3)			0.0554***			
			(2.965)			
GPR_BROAD × InfoCom (IC4)				0.057***		
				(2.557)		
GPR_BROAD × Monitor (IC5)					0.0566***	
					(3.484)	
GPR_BROAD × TICQ						0.051***
						(2.887)
GPR_BROAD	0.0597***	0.0489***	0.0512***	0.0505***	0.0537***	0.0587***
	(2.837)	(3.015)	(2.886)	(3.005)	(2.821)	(3.004)
(IC1)	0.0415***					
	(2.671)					
(IC2)		0.0505***				
		(2.647)				
(IC3)			0.0602***			
			(2.017)			
(IC4)				0.0546***		
				(2.127)		
(IC5)					0.0525***	
					(2.225)	
TICQ						0.0531***
						(2.187)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.226	0.202	0.203	0.24	0.201	0.274

The represented results in Table 11 ensure that interaction between the GPR_NARROW and the internal control index has a significant positive effect on the cash holding, i.e., the internal control index supported the origin relationship between the GPR_NARROW and the cash holding.

Table 11.
Moderate role of IC index in relation between GPR_NARROW & CH.

Variables	**(30)**	**(31)**	**(32)**	**(33)**	**(34)**	**(35)**
GPR_NARROW × CtrEnv (IC1)	0.0588***					
	(2.816)					
GPR_NARROW × RiskAssess (IC2)		0.0604***				
		(2.871)				
GPR_NARROW × CtrAct (IC3)			0.0611***			
			(2.765)			
GPR_NARROW × InfoCom (IC4)				0.0578***		
				(3.516)		
GPR_NARROW × Monitor (IC5)					0.0615***	
					(3.058)	
GPR_NARROW × TICQ						0.0618***
						(2.704)
GPR_NARROW	0.0497***	0.0512***	0.0581***	0.0605***	0.0596***	0.0576***
	(3.105)	(2.921)	(2.436)	(3.216)	(2.115)	(2.127)

(IC1)	0.0518***					
	(3.157)					
(IC2)		0.0502***				
		(2.161)				
(IC3)			0.0561***			
			(2.157)			
(IC4)				0.0487***		
				(2.318)		
(IC5)					0.0602***	
					(2.415)	
TICQ						0.0495***
						(2.218)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.235	0.26	0.199	0.206	0.233	0.262

The represented results in Table 12 ensure that interaction between the geopolitical risk components and the internal control index has a significant positive effect on the cash holding, i.e., the internal control index supported the origin relationship between the GPR and the cash holding.

Table 12.
Moderate role of IC index in relation between GPR & CH.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GPR × CtrEnv (IC1)	0.060***					
	(2.989)					
GPR × RiskAssess (IC2)		0.0576***				
		(2.724)				
GPR × CtrAct (IC3)			0.0618***			
			(3.462)			
GPR × InfoCom (IC4)				0.0518***		
				(2.666)		
GPR × Monitor (IC5)					0.0554***	
					(2.699)	
GPR × TICQ						0.06***
						(3.453)
GPR	0.0551***	0.0527***	0.0597***	0.0605***	0.0587***	0.0520***
	(2.621)	(2.451)	(2.387)	(2.915)	(2.455)	(2.621)
(IC1)	0.0487***					
	(2.463)					
(IC2)		0.0495***				
		(2.455)				
(IC3)			0.0471***			
			(2.461)			
(IC4)				0.0426***		
				(2.477)		
(IC5)					0.0511***	
					(2.458)	
TICQ						0.0522***
						(2.463)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.23	0.203	0.271	0.207	0.187	0.23

Source: Consequently, the third hypothesis can be accepted in the alternative form.

$H_{3:}$ Internal Control Index Supported the Relationship Between GPR and Cash Holding in Saudi Banks

The control environment has an impact on all COSO goals by making sure that moral decision-making promotes operational effectiveness, encourages accurate reporting, and ensures adherence to legal requirements. By adapting execution to both internal values and external expectations, an advanced control environment enhances administrative strength and supports GPR risk management initiatives [99-101]. Better internal control could significantly raise the value of corporate cash holdings. GPR risk assessment supports reliable reporting by identifying financial risks and implementing controls to prevent errors and fraud in financial reporting processes [99, 100]. Since control activities integrate internal controls into day-to-day operations, they are essential for guaranteeing adherence to legal and regulatory requirements. They improve the organization's ability to adapt its procedures to important goals, fulfill legal obligations, and foster a culture of accountability by lowering the likelihood of errors and fraud [99, 100].

4.5. Robustness Results

In this section, robustness tests were conducted in two consecutive stages: the first concerning alternative measures of the dependent variable, and the second concerning alternative measures of the independent variable, which is geopolitical risk.

4.5.1. Robustness Checks by Alternative Measure of Cash Holding

In this part, the current study uses the natural logarithm of cash and its equivalents instead of the main measure tool of the cash holding ratio used above in the fundamental analysis of this research. Consequently, the results of Table 13 represent the relationship between geopolitical risk and the natural logarithm of cash.

Table 13.
GPR & Cash Log.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
GPR_THREAT	0.0606***				
	(2.934)				
GPR_ACT		0.0614***			
		(2.677)			
GPR_BROAD			0.0519***		
			(3.407)		
GPR_NARROW				0.051***	
				(3.540)	
GPR					0.0594***
					(3.069)
Constant	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000
R-squared	0.244	0.266	0.232	0.21	0.198

Table 13 ensures the main result of the first main hypothesis, where the positive relationship between the GPR and the natural logarithm of cash still exists, so the alternative form of the first main hypothesis can be accepted.

Table 14.
IC index & Cash Log.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CtrEnv (IC1)	0.0551***					
	(3.603)					
RiskAssess (IC2)		0.060***				
		(2.831)				
CtrAct (IC3)			0.0621***			
			(2.824)			
InfoCom (IC4)				0.0547***		
				(3.383)		
Monitor (IC5)					0.0518***	
					(2.725)	
TICQ						0.0539***
						(3.330)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes

Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.244	0.199	0.192	0.244	0.195	0.217

Table 14 ensures the main result of the second main hypothesis, where the positive relationship between the IC index and the natural logarithm of cash still exists, so the alternative form of the second main hypothesis can be accepted.

Table 15.
Moderate role of IC index in relation between GPR_THREAT & Cash Log.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GPR_THREAT × CtrEnv (IC1)	0.0524***					
	(2.908)					
GPR_THREAT × RiskAssess (IC2)		0.0619***				
		(3.319)				
GPR_THREAT × CtrAct (IC3)			0.0536***			
			(3.469)			
GPR_THREAT × InfoCom (IC4)				0.0512***		
				(3.122)		
GPR_THREAT × Monitor (IC5)					0.0568***	
					(2.512)	
GPR_THREAT × TICQ						0.0532***
						(3.472)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.263	0.197	0.246	0.263	0.194	0.249

Table 15 ensures the positive relationship between the interaction of the IC index with GPR_THREAT and the natural logarithm of cash still existing.

Table 16.
Moderate role of IC index in relation between GPR_ACT & Cash Log.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
GPR_ACT × CtrEnv (IC1)	0.0609***					
	(3.000)					
GPR_ACT × RiskAssess (IC2)		0.056***				
		(2.516)				
GPR_ACT × CtrAct (IC3)			0.0602***			
			(3.608)			
GPR_ACT × InfoCom (IC4)				0.0534***		
				(2.529)		
GPR_ACT × Monitor (IC5)					0.0581***	
					(3.215)	
GPR_ACT × TICQ						0.051***
						(3.265)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.235	0.225	0.262	0.189	0.195	0.225

Table 16 ensures the positive relationship between the interaction of the IC index with GPR_ACT and the natural logarithm of cash still exists.

Table 17.
Moderate role of IC index in relation between GPR_BROAD & Cash Log.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
GPR_BROAD × CtrEnv (IC1)	0.062***					
	(2.751)					
GPR_BROAD × RiskAssess (IC2)		0.0603***				
		(3.295)				
GPR_BROAD × CtrAct (IC3)			0.0557***			
			(3.128)			
GPR_BROAD × InfoCom (IC4)				0.062***		
				(2.883)		
GPR_BROAD × Monitor (IC5)					0.0543***	
					(3.091)	
GPR_BROAD × TICQ						0.0582***
						(2.695)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.224	0.254	0.229	0.193	0.186	0.241

Table 17 ensures the positive relationship between the interaction of the internal control index with GPR_BROAD and the natural logarithm of cash still existing.

Table 18.
Moderate role of IC index in relation between GPR_NARROW & Cash Log.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
GPR_NARROW × CtrEnv (IC1)	0.0539***					
	(2.824)					
GPR_NARROW × RiskAssess (IC2)		0.0512***				
		(2.936)				
GPR_NARROW × CtrAct (IC3)			0.0618***			
			(3.582)			
GPR_NARROW × InfoCom (IC4)				0.0523***		
				(3.192)		
GPR_NARROW × Monitor (IC5)					0.0528***	
					(2.733)	
GPR_NARROW × TICQ						0.0516***
						(2.981)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.239	0.268	0.268	0.208	0.236	0.273

Table 18 ensures the positive relationship between the interaction of the IC index with GPR_NARROW and the natural logarithm of cash still existing.

Table 19.
Moderate role of IC index in relation between GPR & Cash Log.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
GPR × CtrEnv (IC1)	0.0594***					
	(3.234)					
GPR × RiskAssess (IC2)		0.0618***				
		(2.561)				
GPR × CtrAct (IC3)			0.0598***			
			(2.795)			
GPR × InfoCom (IC4)				0.0559***		
				(2.844)		
GPR × Monitor (IC5)					0.0542***	
					(3.498)	
GPR × TICQ						0.0534***
						(3.006)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.27	0.238	0.233	0.227	0.192	0.188

Table 19 confirms the main result of the third hypothesis, where the positive relationship between the interaction of the internal control index with GPR and the natural logarithm of cash still exists, so the alternative form of the third hypothesis can be accepted.

4.5.2. Robustness Checks by Alternative Measure of Geopolitical Risk

Instead of using the annual average of the components, the current study uses an average for each of the four quarters (Q1, Q2, Q3, and Q4) separately. Second, we take the December GPR, the average of the Q1 and Q2, and the average of the Q3 and Q4. Thus, the correlation between the cash holding ratio and the quarterly geopolitical risk is shown in Table 20. While the results of Table 21 represent the relationship between the quarterly GPR and the natural logarithm of cash. The results of Tables 20 & 21 are so consistent with the main fundamental results of the relationship between the geopolitical risk and the cash holding levels measured by the cash holding ratio and the natural logarithm of cash.

Table 20.
Quarterly GPR & CH ratio.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GPR_Q1	0.0617***						
	(3.393)						
GPR_Q2		0.0608***					
		(3.571)					
GPR_Q3			0.0545***				
			(2.961)				
GPR_Q4				0.0518***			
				(3.620)			
GPR_Q1&2					0.0598***		
					(2.656)		
GPR_Q3&4						0.0621***	
						(2.805)	
GPR_December							0.0527***
							(2.814)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.255	0.239	0.261	0.274	0.233	0.271	0.256

Table 21.
Quarterly GPR & Cash Log.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GPR_Q1	0.0542***						
	(2.537)						
GPR_Q2		0.0537***					
		(2.967)					
GPR_Q3			0.059***				
			(3.090)				
GPR_Q4				0.0517***			
				(3.006)			
GPR_Q1&2					0.0617***		
					(3.514)		
GPR_Q3&4						0.0526***	
						(2.631)	
GPR_ December							0.0532***
							(3.273)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	334	334	334	334	334	334	334
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.194	0.257	0.247	0.204	0.236	0.266	0.228

5. Discussion and Conclusions

The purpose of the current study is to assess how internal controls enhance CH and GPR management. Liquidity management is one of the most crucial responsibilities for numerous KSA banks. Theoretical background provides a special lens through which to study how efficient internal controls affect cash management. This study examines each component to verify the specific role of internal control in GPR and cash holdings. Statistical results show that geopolitical risk (GPR_THREAT, GPR_ACT, GPR_BROAD, GPR_NARROW) has a positive significant effect on the cash holding level; these results mean that increasing geopolitical risk leads to holding more cash to avoid probable risks in the surrounding environment in Saudi banks. Statistical results show that the internal control index (control environment, risk assessment, control activities, information and communication, monitoring) has a positive significant effect on the cash holding level; these findings imply that raising the internal control index results in holding more cash to mitigate likely risks in the surrounding environment. The results demonstrate that the interaction between the geopolitical risk components and the internal control index has a significant positive effect on cash holdings, i.e., the internal control index supports the original relationship between GPR and cash holdings in Saudi banks, and improved internal control could significantly increase the value of corporate cash holdings. GPR risk assessment supports reliable reporting by identifying financial risks and implementing controls to prevent errors and fraud in financial reporting processes. Our results withstand rigorous robustness tests; the findings are consistent with the main fundamental results regarding the relationship between geopolitical risk and cash holding levels, measured by the cash holding ratio and the natural logarithm of cash.

5.1. Research Implications

Our findings have important implications for the literature that has examined the effect of internal control on GPR and CH [84]. While a positive relationship between CH and internal control has been widely reported, less is known about whether the responsiveness to GPR is heterogeneous across Saudi banks. The overall negative impact of geopolitical risk on cash holdings is reflected in the use of internal control systems. This is appreciated by external shareholders, which reduces the negative impact of geopolitical risk on banks' value. Our findings resist rigorous robustness testing, shed light on the complex dynamics of cash holding decisions in the face of geopolitical risk, and provide a new viewpoint on the internal control literature. We identify important channels behind banks' distinct response to improving the internal control system. Based on prior studies, we reveal that GPR exacerbates information asymmetry, makes it harder to obtain outside funding, and raises the cost of outside funding, all of which impose further financial limitations on businesses. For preventive reasons, as a safeguard against monetary limitations and to continue their current operations and investments during times of high GPR, firms are more likely to delay corporate expenditures during high GPR periods in order to save greater cash reserves for future investment financing when GPR declines. We also offer important insights to the finance literature by examining how effective internal control enables businesses to target the ideal level of cash holdings and how the internal control environment could reduce the negative effects caused by information asymmetry during GPR periods, playing a regulatory role in different cash holding levels. Companies with higher IC have a full suite of risk management practices, including tools and techniques for risk assessment, risk response, risk detection, and scientific risk management. Because IC effectively evaluates GPR, the costs and advantages of retaining more or less cash, and adopts cash policies, these firms with greater IC are less likely to have abnormal cash reserves or cash deficits.

5.2. Policy Implications

For policymakers, our findings also have a number of ramifications. International policymakers and standard-setters continue to have serious concerns about GPR. The following helpful information is provided by our study to Saudi bank officials, market participants, and businesses: For a variety of reasons, firms in every industry have been holding more cash lately. During times of global instability, businesses keep greater cash reserves as a precaution, which makes it even more important to review cash holdings. The bank categorizes geopolitical risk alongside economic and policy uncertainty as part of the "uncertainty trinity." Further insights into how geopolitical concerns affect business financing and cash holding decisions are also provided by the current study. In particular, it shows how Saudi banks' quality internal controls allow them to significantly reduce geopolitical risk. When creating suitable rules to address GPR and promote the economy, governments and regulators can benefit from our insights.

5.3. Limitations and Future Research

Although the study's conclusions provide insightful information, they also have several limitations that present significant opportunities for further research on this crucial subject. First, because our focus on Saudi banks may not be generalizable to other businesses, especially those in the industrial sector, future research could examine how geopolitical risk affects the industrial sector and the location choices made by businesses in KSA and other emerging and advanced market economies. Manufacturing-related businesses, in particular, tend to save more money and guard against risk spillover. Second, in addition to cash holdings and internal control, it would be worthwhile to explore additional factors such as external audits and important audit issues that affect geopolitical risk management. Third, analyzing businesses from various sectors, such as services, and their placement choices in markets with lower versus higher geopolitical risk would be relevant. Fourth, there has been considerable interest in the topic of COVID-19's effect on GPR. Numerous studies have attempted to investigate and clarify how macroeconomic factors and pandemics interact. For instance, one of the financial products significantly impacted by COVID-19 is crude oil futures [57]. The oil price was 10 times more variable during the start of the COVID-19 pandemic than it was before the pandemic, according to [102]. However, the results of data stability tests also demonstrated that the data are time-stable and interference-free in our study, even if COVID-19 and macroeconomic factors were beyond the chosen research boundaries. Fifth, in addition to examining the effects of other uncertainty metrics, future studies may look at ownership and board dimensions and governance issues to better understand the relationship between GPR and CH.

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