

Economic policy uncertainty, geopolitical risk and cash holdings: evidence from Saudi Arabia

EPU, GPR and
cash holdings

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Received 12 July 2022
Revised 24 September 2022
23 October 2022
Accepted 26 October 2022

Abstract

Purpose – This study aims to investigate the influence of economic policy uncertainty (EPU) and geopolitical risk (GPR) on corporate cash holding level and speed of adjustment (SOA) in one of the most important emerging markets in the Middle East and North Africa, Saudi Arabia. It also investigates whether Shariah-compliance as well as financial constraints affect the relationship between both EPU and GPR and corporate cash holdings.

Design/methodology/approach – The study employs GMM regression considering a sample of 140 nonfinancial firms drawn from the Saudi stock market over the period 2002 to 2019.

Findings – The authors find evidence in support of the precautionary motive hypothesis. Facing costly external financing induced by economic policy-related uncertainty and geopolitical tension, Saudi firms tend to accumulate cash as a buffer against negative shocks to their cash flows. The results also show that the positive impact of EPU and GPR on the level of cash holding is less pronounced in Shariah-compliant firms, whereas it is more pronounced in more financially constrained firms. Evidence also reveals that the estimated adjustment coefficients show that Saudi firms adjust more quickly toward their target cash ratio in periods of high economic instability and geopolitical risks.

Practical implications – This study has important implications for managers, policymakers and regulators. For managers, the study is an important reference to understand and design cash management policies by considering factors measured at the country level. More specifically, managers should pay more attention to periods of heightened uncertainties and geopolitical tensions in which the availability of funds is reduced. For policymakers and regulators, this study may be useful in assessing the effect of economic instability on firm's cash holding decision. Therefore, in an effort to increase the supply of external financing available to firms, policymakers may devise investment friendly environment by controlling country-specific factors.



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Arab Gulf Journal of Scientific
Research
Vol. 41 No. 2, 2023
pp. 183-201
Emerald Publishing Limited
e-ISSN: 2536-0051
p-ISSN: 1985-9899
DOI 10.1108/AGJR-07-2022-0109

Originality/value – This paper shows how EPU and GPR as institutional environment factors affect cash holding decision in an oil-rich country.

Keywords Cash holdings, Economic uncertainty, Geopolitical risk, Speed of adjustment

Paper type Research paper

1. Introduction

In recent years, a large number of firms across the world have bankrupted due to a shortage of holding cash. Therefore, firms all over the world have built up huge cash reserves to avoid the uncertainty of the economic environment (Phan, Nguyen, Nguyen, & Hegde, 2019). In this paper, we investigate whether and how economic policy uncertainty (EPU) and geopolitical risk (GPR) affect corporate cash holdings in an emerging economy, the Kingdom of Saudi Arabia (KSA), where such kind of risks are more relevant. This question is of great importance because EPU and GPR have become substantial concerns in the post-financial crisis era and the policy uncertainty in the global economies, particularly in emerging economies, has already risen to extraordinarily high levels (Xiang, 2022). According to Javadi, Mollagholamali, Nejadmalayeri, and Al-Thaqeb (2021), understanding the effect of policy uncertainty on cash holdings is important, because cash holdings can not only act as a safety net in the presence of costly external financing but may also impact investors' concerns about managerial self-dealing, and both are likely to increase with policy uncertainty. Phan *et al.* (2019) argue that macro-economic uncertainties are important concerns that influence the environment within which businesses operate, that can be directly linked with the financial decisions. Several studies such as Al-Najjar (2013) and Demir and Ersan (2017) have documented strong evidence on the role of macro-economic changes in increasing the uncertainty in emerging economies. This is likely to raise external financing costs for firms operating in these economies (Demir, Diez-Esteban, & Garcia-Gomez, 2019).

To measure uncertainty, we use the word uncertainty index (WUI) of Ahir, Bloom and Furceri (2022). The WUI index is a measure that tracks uncertainty across the globe by text mining the country reports of the Economist Intelligence Unit (EIU). It reflects the frequencies of the word “uncertainty” (and its variants) in the EIU country reports. To make the WUI comparable across countries, the authors scale the raw counts by the total number of words in each report. Furthermore, our proxy to measure GPR is adopted from the study of Caldara and Iacoviello (2018). In their article, the authors developed a monthly index of GPR by counting the occurrence of words related to geopolitical tensions in the main leading international newspapers. By using this measure, we are considering not only terrorist attacks, but also other forms of geopolitical tensions like war risks, military threats and Middle East tensions, and hence capture a wider array of exogenous global uncertainty (Demir *et al.*, 2019).

In further analyses, we investigate whether Shariah-compliance as well as financial constraints affect the relationship between both EPU and GPR and corporate cash holdings. Recent studies indicate that Shariah-compliant (SC) firms face several financial restrictions to maintain their compliance status (Alnori & Alqahtani, 2019; Bugshan, Alnori, & Bakry, 2021; Guizani & Abdalkrim, 2021). In particular, these firms have access to limited financing channels in comparison with non-Shariah-compliant (NSC) firms, which, in turn, considerably affect the external financing choices of SC firms.

Furthermore, cash holding is more valuable to firms with severe financial constraints. Since financially constrained firms typically do not have sufficient internal funds to finance investments and lack access to external capital, they are likely to save a larger amount of their cash flow for precautionary cash holdings than unconstrained firms (Almeida, Campello, & Weisbach, 2004).

We also examine the effects of EPU and GPR on the speed of adjustment (SOA) of cash toward target. To the extent that uncertainty shocks induce financing frictions, firms incur

increased adjustment costs, which invariably affect the frequency with which they rebalance cash holdings (Tut, 2022).

Investigating the impact of EPU and GPR on corporate cash holdings represents an important distinction from prior literature. First, as reported by Attig, El Ghouli, Guedhami, and Zheng (2021), EPU and GPR differ from macroeconomic and event-related uncertainties, such as uncertainty about macroeconomic fundamentals and financial crises. Therefore, this study differs from those of Guizani and Ajmi (2021a and b) focusing on macroeconomic factors such as monetary policy, financial development, financial reforms and oil price volatility. Second, our study differs from those focusing on Shariah-compliance and corporate cash holdings (e.g. Guizani & Abdalkrim, 2021; Bugshan *et al.*, 2021) to the extent that these studies examine the direct effect of Shariah-compliance on cash holding decision, whereas, our study examines whether Shariah-compliance moderates the relationship between both EPU and GPR and corporate cash holdings.

Prior studies emphasize two broad theories for explaining corporate liquidity decision making opposite predictions on the impact of EPU and GPR on cash holdings: the precautionary motive and the agency problems (Phan *et al.*, 2019; Javadi *et al.*, 2021; Tut, 2022). The precautionary motive is concerned with unpredicted cash needs. Companies tend to retain more cash in anticipation of future cash flows volatility and costly external financing (Bates, Kahle, & Stulz, 2009). We argue that the precautionary motive for corporate cash holdings becomes even more important during times of high uncertainty since economic policy-related uncertainty and geopolitical tension are associated with financing frictions and increased cost of external capital. According to Phan *et al.* (2019), firms are motivated to increase cash reserves to cope with the uncertainty that can potentially occur in coming years.

The agency-theoretic view, however, would suggest a negative association between both EPU and GPR and cash holdings. Under this perspective, managers, confronted with a low investment opportunity set, have the incentive to hoard excess cash to benefit themselves at the expense of investors. By retaining excess cash flow, managers reduce their need for raising external funds, which in turn gives them the freedom from capital market monitoring (Guizani & Abdalkrim, 2021). As pointed out by Attig *et al.* (2021), firms are likely to be more vulnerable to agency problems during high-uncertainty periods since these periods are associated with decreased real economic activities (Baker, Bloom, & Davis, 2016) and depressed corporate capital investment (Javadi *et al.*, 2021). This in turn will increase cash reserves, which may be misused due to managerial rent extraction. A possible solution to this problem is to reduce discretionary cash available to managers (Jensen, 1986).

Motivations for this study come from the unique institutional settings of KSA. First, Saudi Arabia relies heavily on the hydrocarbon sector as its main source of income, since this sector is the largest contributor to GDP. Hydrocarbon exports represent about 80% of total exports and fiscal dependence on hydrocarbon revenues is over 90% of total fiscal revenues. Therefore, Saudi Arabia is exposed to any movement in oil price that causes more volatility in its economic activities and subsequently uncertainty in economic growth (Al-Khouri & Dhade, 2014). Second, oil-producing regions are distinguished not only by their natural endowments, but also by their high GPR (Wang, Xiong, Mirza, Shao, & Yue, 2021). Military conflicts and political instabilities are common in the MENA region, as evidenced by the Iraq war, Iran's nuclear issue, Yemen's civil war, Arab Spring revolutions and many other events. Finally, many firms in Saudi Arabia adopt Islamic business principles, which have some unique financial characteristics. Previous studies argue that compliance to Shariah imposes restrictions relate to various financial decisions, including investments, financing, operations and risk management decisions (Alnori & Alqahtani, 2019; Bugshan *et al.*, 2021; Guizani & Abdalkrim, 2021).

The paper contributes to the existent literature at least in three ways. First, the present study enriches the growing body of knowledge on political, economic and geopolitical uncertainties by concentrating on a critical financial decision, specifically the decision of cash holdings. In fact,

uncertainty is considered as an important driver of financial decisions. Second, because changes in the requirement of cash is an indicator of current and future investment needs of the firm and it also reflects the fund appetite of a firm, we investigate the effect of GPR and EPU variables on the dynamic aspect of corporate cash holdings by measuring the SOA. Third, this study also tries to test whether the effect of GPR and EPU variables on corporate cash holdings depends on Shariah-compliance status and financial constraints.

The rest of the paper is organized as follows: Section two reviews the literature and develops the research hypotheses; section three describes the empirical study; section four presents and discusses the empirical results and section five concludes.

2. Literature review and hypotheses development

2.1 Uncertainty and cash holdings: precautionary motive vs. agency problems

Cash holdings literature has predominantly offered two frameworks to explain corporate cash holdings and its dynamic: precautionary motive and agency problems. These two theories make opposite predictions on the impact of EPU and GPR on cash holdings.

The precautionary motive refers to the desire to hold sufficient cash for unexpected contingencies. Holding more liquidity acts as a buffer against negative shocks. Therefore, firms tend to accumulate more cash reserves to avoid raising funds when external capital is expensive (Bates *et al.*, 2009; Guizani, 2017). Numerous studies dealing with cash holdings examine situations in which the precautionary motive plays an important role. Opler, Pinkowitz, Stulz, and Williamson (1999), for example, argue that the precautionary motive becomes more important when firms anticipate future cash flows to be volatile and access to capital markets to be costly. Similarly, Almeida *et al.* (2004) report that firms hold cash to avoid raising funds when external capital is expensive.

The precautionary motive for corporate cash holdings becomes even more important during high EPU and GPR. According to Javadi *et al.* (2021), policy uncertainty can exacerbate information asymmetry, financing frictions and increase cost of external capital. Therefore, firms hold more liquidity to hedge against very costly adverse shocks in cash flows (Phan *et al.*, 2019; Tut, 2022). Baum, Chakraborty, Han, and Liu (2012) conclude that during times of heightened uncertainties, managers would display a more conservative behavior by increasing the liquidity level of the firm. By investigating the impact of EPU on the cash holding decisions of firms in the BRIC countries (Brazil, Russia, India and China), Demir and Ersan (2017) find supportive evidence to the precautionary motive for the cash holdings. Their results reveal that firms in BRIC countries built up cash holdings during periods of high EPU. Using a cross-country setting, Li (2019) provides evidence consistent with the hypothesis that EPU affects cash policy through precautionary saving motives. The findings show a positive association between EPU and cash holdings, as well as the propensity to save cash out of operating cash flow. Phan *et al.* (2019) report similar results for the US firms. They provide evidence that firms accumulate more cash reserves in response to higher EPU. Feng *et al.* (2022) investigate Chinese companies from 2003 to 2015 and show that the companies increase their cash reserves during increased EPU periods, using cash holdings as a safety net.

Additionally, a number of studies bring evidence that the economic uncertainty is very closely related to the oil price uncertainty topic. For instance, Bugshan *et al.* (2021) finds a positive and significant relationship between oil price volatility and firms' cash holdings. Alomran and Alsubaiei (2022) report similar results that oil price volatility is positively associated with corporate cash holdings, and this positive relationship is more pronounced in firms operating in oil-exporting countries and in oil-exposed industries.

Other studies lend further credence to the precautionary motive framework for corporate cash holdings in the face of high GPR. Evidence in Kotcharin and Maneenop (2020) examining the cash holding decisions of global shipping firms in response to a change in GPR is consistent with the precautionary motive. Shipping companies significantly increase their

cash reserves in response to higher GPR. Similarly, [Lee and Wang \(2021\)](#) find that firms exposed to high GPR tend to hoard more cash as a precautionary measure. Extending the work of [Lee and Wang \(2021\)](#) and [Wang et al. \(2021\)](#) investigate the various effects of GPR on firm cash holdings in Chinese oil sectors. They find that companies in the oil exploration and exploitation and oil equipment sectors tend to keep more cash on hand to deal with high GPR. Based on these discussions, we propose the following hypothesis.

H1 (Precautionary motive hypothesis). EPU and GPR positively affect the level of corporate cash holdings.

The agency problems framework pioneered by [Jensen \(1986\)](#) suggests that corporate insiders generally have an incentive to retain cash rather than increasing dividends when outside investment opportunity is limited. [Opler et al. \(1999\)](#) argue that managers prefer excess liquidity as it reduces the firm risk and increases their discretion. Risk-averse managers tend to hoard cash as a buffer in case of an economic downturn. They will save as much free cash-flow (FCF) as possible, in order to be less dependent on the capital market. By contrast, shareholders prefer dividends over retained earnings to reduce excessive cash under managers' control. According to [Javadi et al. \(2021\)](#), lower cash holding in the face of higher policy uncertainty disciplines the managers to be more prudent in the use of the firm's resources. In this context, managers will tap into capital markets to fund future investments, which will expose them to subsequent monitoring by the market.

As argued by [Attig et al. \(2021\)](#), firms are likely to be more vulnerable to agency problems of FCF during high EPU and GPR periods because these periods are associated with decreased real economic activities ([Baker et al., 2016](#)) and hinders investment opportunities ([Javadi et al., 2021](#)). This in turn will increase cash reserves, which can be easily expropriated by managers and turned into private benefits. As such, disgorging excessive cash during increased EPU and GPR periods prevents managers from corporate resource diversion and mitigates the agency problems of FCF ([Attig et al., 2021](#); [Javadi et al., 2021](#)). Thus, to the extent that increased EPU and GPR periods are associated with declining investment opportunity set, agency problems framework suggests that corporate cash holdings should decrease. Several studies support the agency theory motive and document negative effects of EPU and GPR on corporate cash holdings. For instance, [Demir et al. \(2019\)](#) examine the relationship between GPR and corporate cash holdings in emerging countries. The results show that firms tend to keep less cash during rising GPR periods confirming the agency view of cash holdings. In a cross-country examination of the relationship between EPU and corporate cash holding, [Javadi et al. \(2021\)](#) provide evidence consistent with the agency problems framework. They document a strong negative relationship between EPU and corporate cash holdings for nonUS firms from 19 countries. This negative relationship might be interpreted as suggesting that lowering cash holdings help alleviate agency problems in the presence of policy uncertainty. Based on these discussions, we propose our competing hypothesis.

H2 (Agency problems hypothesis). EPU and GPR negatively affect the level of corporate cash holdings.

2.2 Uncertainty, Shariah-compliance and cash holdings

The debate on the restrictions imposed by Shariah principles as potential determinants of corporate financial decisions has triggered the interest of several studies in recent years. This body of work includes [Alnori and Alqahtani \(2019\)](#), [Bugshan et al. \(2021\)](#) and [Guizani and Abdalkrim \(2021\)](#), who show that SC firms face several financial restrictions [1] to maintain their compliance status. These restrictions relate to various financial decisions, including investments, financing, operations and risk management decisions. NSC firms do not need to

comply with these restrictions (Alnori & Alqahtani, 2019; Bugshan *et al.*, 2021). The implication of these restrictions is that SC firms are more constrained in their financing choices. Therefore, owing to the lower supply of external funds, these firms incur higher transaction costs (Guizani & Abdalkrim, 2021). As a result, SC firms are required to hold large amounts of cash reserves to reduce their external financing needs and the associated costs that can result. On the other hand, if a firm has difficulty in raising external capital, it worries more about the threat from policy uncertainty. Thus, we hypothesize the following.

- H3. The impact of EPU and GPR on the level of cash holdings is more pronounced in SC firms.

2.3 Uncertainty, financial constraints and cash holdings

Previous research reports that policy-related uncertainty induces financing frictions, which increase the cost of external financing and exacerbate firms' financial constraints (Phan *et al.*, 2019; Tut, 2022). Facing costly external financing, firms tend to increase cash reserves to buffer against negative shock. Consistent with this argument, Almeida *et al.* (2004) show that financially constrained firms tend to hold a larger amount of cash for precautionary purposes than unconstrained firms. To the extent that high uncertainty periods are associated with increased financial frictions, financially constrained firms face higher costs in accessing external financing than their unconstrained counterparts, and therefore, accumulate more cash reserves. Consistent with this prediction, Lee and Wang (2021) find that firms that are financially constrained maintain cash reserves as buffer against GPR. Tut (2022) provides evidence that firms that are financially constrained tend to increase cash holdings significantly following policy uncertainty shocks. Thus, we hypothesize the following.

- H4. The impact of EPU and GPR on the level of cash holdings is more pronounced in financially constrained firms.

2.4 Uncertainty and the dynamics of cash holdings adjustment

Opler *et al.* (1999) argue that in a perfect market setting, the cash holdings and its adjustment to the target are irrelevant. But in the presence of market imperfections, many factors affect corporate cash holdings and its adjustment dynamics. The trade-off theory (TOT) holds that the company has an optimal level of cash holding, which is the result of balancing the marginal benefits of cash holdings (i.e. transaction cost saving, the precautionary motive) with marginal costs (i.e. cost of carry and agency cost), and if a firm deviates from this optimal target, the cash holdings are adjusted instantaneously (Guizani & Ajmi, 2021b). Thus, to the extent that EPU and GPR exacerbate information asymmetry and financing frictions, increases cost of external capital and aggravate the agency problems of FCF, we conjecture that any change in those factors may affect the decision of the firms to hold cash thereby determining the adjustment mechanism to converge cash holdings to the target. Chen and Mahajan (2010) posit that the adjustment to target cash holdings should be faster in economic booms than in recessions implying that business cycle variables should affect the adjustment speed. According to Ki and Mukherjee (2018), both costs and benefits of cash holdings are affected by macro-economic variables as well as firm-specific variables. The authors conclude that the precautionary motive is directly related to the dynamics of cash holdings overtime via firms' exposure to economic uncertainty. In a similar vein, Anand, Thenmozhi, Varaiya, and Bhadhuri (2018) contend that firms may alter cash levels to changes in macroeconomic factors and may adjust its cash holdings based on expected changes in macroeconomic factors to target cash levels. They find evidence that Indian firms slowly adjust cash to the target or optimum level due to market frictions, in support of the precautionary motive. In a recent paper, Tut (2022) claims that uncertainty creates a wedge between the benefit of current period liquid assets and costly

external finance in future states. These financing frictions lead to an increase in adjustment costs, which decelerate the SOA of cash toward target. Consistent with this hypothesis, the results suggest that there is an inverse relationship between policy uncertainty and SOA of cash. This leads to the following hypothesis.

H5 (Precautionary motive hypothesis). EPU and GPR negatively affect the speed of cash adjustment.

Agency conflicts are another factor explaining differences in the SOA toward the optimal cash holdings level across firms. The FCF theory of [Jensen \(1986\)](#) postulates that self-interested managers are inclined to invest cash inefficiently, because even negative net present value (NPV) projects can increase managerial utility. In a related study, [Harford, Mansi, and Maxwell \(2008\)](#) argue that managers of entrenched firms want to curb stockpiles of cash, because such stockpiles could draw unwanted attention from activist shareholders. According to [Jiang and Lie \(2016\)](#), the implication of these arguments is that the adjustment speed at high cash levels is faster among entrenched firms than among other firms. Similarly, [Orlova and Rao \(2018\)](#) focus on availability of funds, as one of the main factors that contributes to differences in the SOA of cash across firms and find that firms with high FCF have a faster adjustment rate. Recently, [Truong \(2021\)](#) provides evidence that large FCF firms adjust more readily than small FCF firms.

Periods of high policy uncertainty aggravate the agency problems of FCF because these periods are associated with decreased real economic activities ([Baker et al., 2016](#)) and depressed corporate capital investment ([Javadi et al., 2021](#)). Thus, to the extent that larger FCF leads to faster adjustment toward target, it follows that in such periods firms adjust their liquidity faster to target cash reserves. This leads to our compelling hypothesis.

H6 (Agency problems hypothesis). EPU and GPR positively affect the speed of cash adjustment.

3. Methodology

3.1 Data and sample selection

The sample used in the research consists of all Saudi nonfinancial firms listed in the Saudi stock exchange. The data about firm-specific variables have been hand collected from the company financial reports published annually by the “argaam” website [2] that contains the balance sheets, income statements and information on several characteristics of Saudi listed firms. Data about EPU [3] and GPR [4] are selected from [Ahir et al. \(2022\)](#) and [Caldara and Iacoviello \(2018\)](#), respectively.

We have constructed a data panel of nonfinancial quoted Saudi companies for the period ranging from 2002 to 2019. The original sample frame includes 218 listed firms.

To be included in the sample, firms have to be listed in the Saudi stock exchange. First, we have excluded banks and insurance companies because of their specific rules and regulations. Second, we have excluded companies not having continuous data for at least four consecutive years to test for the absence of second-order serial correlation because our the generalized methods of moments (GMM) method is based on this assumption ([Pindado, Requejo, & De la Torre, 2011](#); [Guizani & Ajmi, 2021b](#)). Therefore, our data are an unbalanced panel data, comprising 140 firms with a total of 1802 firm-year observations. [Table 1](#) presents the sample selection and its distribution among industries.

3.2 Model specification and estimation method

We first examine the effect of EPU and GPR on the level of corporate cash holdings. The empirical models can be illustrated as follows:

Table 1.
Sample selection and
distribution

	No. of companies	Percentage of sample
<i>Panel A: Sample selection</i>		
Total firms available to be sampled	218	100
Less: financial companies	46	21.10
Firms with missing four consecutive reports	32	14.68
Total excluded firms	78	35.78
Final selected sample	140	64.22
<i>Panel B: Industrial composition of the sample</i>		
Materials	43	30.71
Energy	5	3.57
Consumer service	26	18.57
Consumer goods	30	21.43
Capital goods	11	7.86
Real estate development	11	7.86
Telecommunication	4	2.86
Transportation	6	4.28
Utilities	4	2.86
<i>Total</i>	<i>140</i>	<i>100</i>

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{WUI}_t + \beta_3 \text{MTB}_{i,t} + \beta_4 \text{Capex}_{i,t} + \beta_5 \text{NWC}_{i,t} + \beta_6 \text{Lev}_{i,t} \\ & + \beta_7 \text{Size}_{i,t} + \beta_8 \text{CF}_{i,t} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{GPR}_t + \beta_3 \text{MTB}_{i,t} + \beta_4 \text{Capex}_{i,t} + \beta_5 \text{NWC}_{i,t} + \beta_6 \text{Lev}_{i,t} \\ & + \beta_7 \text{Size}_{i,t} + \beta_8 \text{CF}_{i,t} + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Where, i and t refer to company and time, respectively.

Second, to test whether the impact of both EPU and GPR on cash holding level is more pronounced in SC firms and in firms with greater financial constraints, we estimate the following models:

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{WUI}_t + \beta_3 \text{Shariah}_{i,t} + \beta_4 \text{WUI}_t \times \text{Shariah}_{i,t} + \beta_5 \text{MTB}_{i,t} \\ & + \beta_6 \text{Capex}_{i,t} + \beta_7 \text{NWC}_{i,t} + \beta_8 \text{Lev}_{i,t} + \beta_9 \text{Size}_{i,t} + \beta_{10} \text{CF}_{i,t} + \text{Year dummies} \\ & + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{GPR}_t + \beta_3 \text{Shariah}_{i,t} + \beta_4 \text{GPR}_t \times \text{Shariah}_{i,t} + \beta_5 \text{MTB}_{i,t} \\ & + \beta_6 \text{Capex}_{i,t} + \beta_7 \text{NWC}_{i,t} + \beta_8 \text{Lev}_{i,t} + \beta_9 \text{Size}_{i,t} + \beta_{10} \text{CF}_{i,t} + \text{Year dummies} \\ & + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{WUI}_t + \beta_3 \text{Fin} - \text{const}_{i,t} + \beta_4 \text{WUI}_t \times \text{Fin} - \text{const}_{i,t} \\ & + \beta_5 \text{MTB}_{i,t} + \beta_6 \text{Capex}_{i,t} + \beta_7 \text{NWC}_{i,t} + \beta_8 \text{Lev}_{i,t} + \beta_9 \text{Size}_{i,t} + \beta_{10} \text{CF}_{i,t} \\ & + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

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$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{GPR}_t + \beta_3 \text{Fin} - \text{const}_{i,t} + \beta_4 \text{GPR}_t \times \text{Fin} - \text{const}_{i,t} \\ & + \beta_5 \text{MTB}_{i,t} + \beta_6 \text{Capex}_{i,t} + \beta_7 \text{NWC}_{i,t} + \beta_8 \text{Lev}_{i,t} + \beta_9 \text{Size}_{i,t} + \beta_{10} \text{CF}_{i,t} \\ & + \text{Year dummies} + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (6)$$

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Where *Shariah* is a dummy variable that takes the value of 1 if the firm is SC and zero otherwise. To classify companies into SC and NSC, this study follows the Shariah Guidelines of Alrajhi Bank for Trading and Investment in Stocks [5]. *Fin-const* is a dummy variable that takes the value of 1 if the firm is financially constrained and zero otherwise. The variable we use for defining constrained firms is payout ratio (Almeida *et al.*, 2004). Financially constrained firms are those that pay low dividend (less than the mean dividend payout ratio period) and financially unconstrained firms are those that pay high dividend (greater than the mean dividend pay-out ratio period).

Third, to investigate the effect of GPR and EPU on the adjustment speed of corporate cash holdings, we follow the approach taken in previous studies (e.g. Alnor & Alqahtani, 2019; Bugshan *et al.*, 2021; Guizani & Ajmi, 2021b). The lagged cash holdings proxy is added to the regression to estimate the adjustment speed of cash holdings (Bugshan *et al.*, 2021). We construct the High-WUI, defined as a dummy variable that equals 1 if the WUI value is above the median and 0 otherwise, and High-GPR, defined as a dummy variable that equals 1 if the GPR value is above the median and 0 otherwise. We add the interactions between the lagged cash holdings and both High-WUI and High-GPR dummies. The interaction variables compare the SOA between periods of high and low EPU and between periods of high and low GPR.

The following two equations show the cash holding adjustment speed regression:

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{High} - \text{WUI}_t + \beta_3 \text{Cash}_{i,t-1} \times \text{High} - \text{WUI}_t + \beta_4 \text{MTB}_{i,t} \\ & + \beta_5 \text{Capex}_{i,t} + \beta_6 \text{NWC}_{i,t} + \beta_7 \text{Lev}_{i,t} + \beta_8 \text{Size}_{i,t} + \beta_9 \text{CF}_{i,t} + \text{Year dummies} \\ & + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (7)$$

$$\begin{aligned} \text{Cash}_{i,t} = & \alpha_0 + \beta_1 \text{Cash}_{i,t-1} + \beta_2 \text{High} - \text{GPR}_t + \beta_3 \text{Cash}_{i,t-1} \times \text{High} - \text{GPR}_t + \beta_4 \text{MTB}_{i,t} \\ & + \beta_5 \text{Capex}_{i,t} + \beta_6 \text{NWC}_{i,t} + \beta_7 \text{Lev}_{i,t} + \beta_8 \text{Size}_{i,t} + \beta_9 \text{CF}_{i,t} + \text{Year dummies} \\ & + \text{Industry dummies} + \varepsilon_{i,t} \end{aligned} \quad (8)$$

Where $(1 - \beta_1)$ captures the firm's ability to adjust to its target cash reserves from period $t-1$ to period t . It estimates the adjustment in cash during period t . The larger the value of $(1 - \beta_1)$, the faster the SOA. The SOA of corporate cash holdings becomes $(1 - \beta_1) - \beta_3 \times \text{High-WUI}_t$. As High-WUI_t is a dummy variable, the SOA is equal to $(1 - \beta_1)$ when $\text{High-WUI}_t = 0$ and $(1 - \beta_1) - \beta_3$ when $\text{High-WUI}_t = 1$. In the same vein, the SOA is equal to $(1 - \beta_1)$ when $\text{High-GPR}_t = 0$ and $(1 - \beta_1) - \beta_3$ when $\text{High-GPR}_t = 1$.

Endogenous problems are a major concern in empirical works, especially when researchers use the coetaneous dependent and independent variables. To address this concern, we use the two-step system GMM originated in [Arellano and Bover \(1995\)](#) and augmented by [Blundell and Bond \(1998\)](#). According to the authors, system GMM eliminates the potential bias issues associated with endogeneity. [Arellano and Bover \(1995\)](#) suggest a specification test (Sargan) to check for the over-identification and AR (2) test for second order autocorrelation in the models. They also suggest the Hansen statistic of over-identifying restrictions in order to test for the absence of correlation between the instruments and the error term. To examine the joint significance of the estimated coefficients for all variables, [Arellano and Bover \(1995\)](#) use the Wald test.

3.3 Variable definitions

Cash holding (Cash) is measured as the sum of cash and cash equivalents scaled by net assets, where net assets are computed as book value of assets less cash and equivalents ([Opler et al., 1999](#); [Guizani, 2017](#); [Orlova & Rao, 2018](#)).

To measure EPU, we use the WUI developed by [Ahir et al. \(2022\)](#). Our proxy to measure GPR is adopted from the study of [Caldara and Iacoviello \(2018\)](#).

We control for several factors that are documented in the literature as having power to explain corporate cash holdings.

- (1) Growth opportunities (MTB): Both the trade-off theory (TOT) and the pecking order theory (POT) contend that good investment opportunities raise the need for cash reserves, and therefore, they expect a positive impact of growth opportunities on cash level. MTB is calculated as the market value of equity divided by the book value of total assets.
- (2) Capital expenditure (Capex): The TOT suggests that firms hold more cash to avoid transaction costs incurred by external financing of investment projects. In contrast, the POT suggests that firms with high investment expenditure are less likely to invest in liquid asset reserves. Capex is the ratio of tangible assets on total assets.
- (3) Net working capital (NWC): The TOT expects an inverse relationship between cash and net working capital as firms can convert their liquid assets into cash. Therefore, firms with high liquid assets are less reliable on capital markets to obtain cash. NWC is the ratio of working capital minus cash and cash equivalents by total assets.
- (4) Leverage (Lev): The TOT suggests that the relationship between leverage and cash holding is negative as highly levered firms keep more cash to avoid bankruptcy risk associated with leverage. The POT also predicts a negative relationship between leverage and cash holding, since firms first prefer internal funds their financing needs and then use debt when retained cash is not sufficient. Lev is calculated as the ratio of total debts divided by total assets.
- (5) Firm size (Size): The TOT suggests a negative relationship between firm size and cash holdings as larger firms enjoy economies of scale, which in turn, enables them to raise external finance at a lower cost. In contrast, the POT suggests that larger firms are more likely to generate larger cash flows, which in turn, enables them to accumulate more cash reserves. Size is measured by the natural logarithm of total assets.
- (6) Cash flow (CF): According to the TOT, internal generated cash flow plays an important role in limiting financial constraints imposed by the capital markets. Therefore, the cash flow is expected to have negative effect on cash holding level.

Contrarily, the POT suggests that firms first prefer internal cash flow and then use the external funds for their financing needs. It follows a positive relationship between cash flow and cash reserves. We measure CF by the earnings before extraordinary items and depreciation less dividends divided by total asset.

EPU, GPR and cash holdings

4. Results and discussion

4.1 Univariate analysis

[Table 2](#) reports summary statistics and correlation matrix of regressions variables from 2002 to 2019 for Saudi firms. As can be seen from Panel A ([Table 2](#)), the level of hoarding cash for Saudi firms is on average equal to 14.8% with a maximum of 98.2 % and a minimum of 1%. The WUI related to the Saudi context has an average of around 0.115, while the GPR index average is equal to 0.240. The MTB ratio ranges from a maximum of 12.19 to a minimum of 0.113 with an average of 2.243. The Capex ratio ranges from 0.985 to 0.026. The NWC for Saudi firms has an average of 0.243. On average 37.2% of Saudi firm's assets are financed by debt. Cash flow value ranges from 0.565 to -5.272.

The correlations' results presented in Panel B of [Table 2](#) show the existence of a positive and significant correlation between cash holdings and both WUI and GPR. We also find that most of the correlation coefficients between cash and control variables are in line with findings of prior studies. Moreover, by looking at the correlation coefficients, we can confirm the absence of multicollinearity problems, which is indicated by VIF scores.

4.2 Regression results

4.2.1 Impact of EPU and GPR on cash holding level. The regression outputs of the system GMM estimations are summarized in [Table 3](#) (columns 1 and 2). As can be seen, the results are in sharp contrast to the prediction of the agency problems hypothesis and are consistent with precautionary motive hypothesis. We find that Saudi firms increase their cash holdings in the face of EPU and GPR. Focusing on Models (1) and (2), the coefficients on WUI and GPR are positive and both statistically and economically significant at the 1% level. As argued by previous studies, when facing a high level of uncertainty, firms' future cash flow is more volatile, and information asymmetry escalates, increasing the capital market's external financing cost ([Phan et al., 2019](#); [Kotcharin & Maneenop, 2020](#); [Javadi et al., 2021](#)). Consequently, firms lacking access to external financing hold more cash to shelter themselves from adverse and costly shocks.

Our findings are consistent with [Demir and Ersan \(2017\)](#), [Li \(2019\)](#), [Phan et al. \(2019\)](#) and [Feng et al. \(2022\)](#), who find that during times of policy uncertainty, firms are more driven to increase their cash reserves to act as a precautionary buffer against economic shocks and maintain operational continuity. Our results are also consistent with those of [Kotcharin and Maneenop \(2020\)](#), [Lee and Wang \(2021\)](#) and [Wang et al. \(2021\)](#), who find that cash holding is positively linked with GPR.

Turning to control variables, we find results that are generally consistent with cash holdings literature. MTB and Size variables are positively and significantly (at 1% level) associated with the level of cash holdings. Consistent with the POT, our model results prove that growing companies accumulate more cash. Growth companies are expected to face more asymmetric information problems, leading to higher financing costs for such firms, and therefore, they tend to hold high level of cash reserves. The positive impact of firm size is consistent with the prediction of the POT that larger firms accumulate more cash reserves as they are more likely to generate larger internal funds. There is a significant (1%) negative relationship between cash holdings and capital expenditure, which indicates that firms prefer to use internally sourced funds to finance their investment of capital assets. The coefficient of

Table 2.
Descriptive statistics
and correlation matrix

Variables	Mean	Median	Std. Dev.	Min	Max
<i>Panel A: Summary statistics</i>					
Cash	0.148	0.094	0.156	0.001	0.982
WUI	0.115	0.096	0.099	0.000	0.464
GPR	0.240	0.200	0.150	0.040	0.900
MTB	2.243	1.718	1.571	0.113	12.19
Capex	0.643	0.677	0.206	0.026	0.985
NWC	0.243	0.183	0.297	-7.582	1.525
Lev	0.372	0.350	0.216	0.000	1.342
Size	14.46	14.31	1.612	9.856	19.99
CF	0.084	0.075	0.169	-5.272	0.565
<i>Panel B: Matrix of correlation and VIF test</i>					
Cash	1				
WUI	0.119***	1			
GPR	0.075***	0.534***	1		
MTB	0.162***	-0.018	-0.018	1	
Capex	-0.350***	-0.033***	-0.025***	-0.189***	1
NWC	-0.145***	-0.073***	-0.029***	0.085***	-0.607***
Lev	-0.213***	-0.112***	-0.099***	0.032***	-0.099***
Size	-0.099***	-0.110***	-0.103***	-0.228***	0.243***
CF	-0.041*	-0.003	-0.019	0.056**	-0.011
Note(s): ***, ** and * indicate significance at 1, 5 and 10%, respectively					

Variables	Full sample		SC vs. NSC firms		Constrained vs. unconstrained firms	
	WUI (1)	GPR (2)	WUI (3)	GPR (4)	WUI (5)	GPR (6)
<i>Cash (t-1)</i>	0.616*** (21.43)	0.604*** (20.73)	0.624*** (22.08)	0.611*** (21.03)	0.621*** (21.95)	0.613*** (21.12)
<i>WUI</i>	0.022*** (3.21)		0.017*** (2.95)		0.015*** (2.89)	
<i>GPR</i>		0.013*** (2.94)		0.009*** (2.77)		0.010*** (2.83)
<i>Shariah</i>			0.026*** (3.44)			
<i>WUI× Shariah</i>			-0.008*** (-2.18)			
<i>GPR× Shariah</i>				-0.006** (-2.03)		
<i>Fin-const</i>					0.031*** (3.61)	0.029*** (3.53)
<i>WUI× Fin-const</i>					0.011*** (3.06)	
<i>GPR× Fin-const</i>						0.008*** (2.74)
<i>MTB</i>	0.014*** (4.22)	0.013*** (4.19)	0.016*** (4.29)	0.014*** (4.22)	0.016*** (4.30)	0.015*** (4.26)
<i>Capex</i>	-0.448*** (-7.53)	-0.448*** (-7.52)	-0.451*** (-7.72)	-0.448*** (-7.52)	-0.452*** (-7.73)	-0.451*** (-7.72)
<i>NWC</i>	-0.216*** (-6.84)	-0.215*** (-6.82)	-0.218*** (-6.97)	-0.216*** (-6.83)	-0.218*** (-6.97)	-0.218*** (-6.96)
<i>Lev</i>	-0.138*** (-4.56)	-0.136*** (-4.53)	-0.142*** (-4.68)	-0.136*** (-4.51)	-0.143*** (-4.69)	-0.138*** (-4.57)
<i>Size</i>	0.018*** (5.14)	0.017*** (5.12)	0.020*** (5.21)	0.019*** (5.17)	0.020*** (5.22)	0.020*** (5.22)
<i>CF</i>	-0.049*** (-3.57)	-0.049*** (-3.55)	-0.051*** (-3.66)	-0.049*** (-3.58)	-0.051*** (-3.66)	-0.051*** (-3.66)
<i>Constant</i>	0.271*** (4.31)	0.193*** (4.03)	0.306*** (4.71)	0.228*** (4.12)	0.324*** (4.93)	0.316*** (4.67)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.443	0.396	0.547	0.455	0.551	0.537
Sargan Test	0.201	0.173	0.313	0.231	0.318	0.309
Hansen Test	0.292	0.264	0.377	0.317	0.386	0.372
Wald test	302.6	289.5	338.6	315.1	393.1	333.6
N	1,802	1,802	1,802	1,802	1,802	1,802

Note(s): This table shows the two-step system GMM estimators of the impact of EPU and GPR on cash holding level for the full sample. It also presents the GMM estimation results of the impact of economic uncertainty and geopolitical risks on corporate cash holdings for SC vs. NSC firms and less vs. more financially constrained firms. The z-statistics are reported in parentheses. ***, **, and * indicate significance at 1, 5 and 10%, respectively

Table 3.
Impact of economic uncertainty and geopolitical risks on cash holding level

NWC is negative and significant at 1%, which means that an increase in NWC reduces the level of cash holdings. The result implies that when a firm has multiple cash substitutes, it holds less cash. The coefficient of leverage is negative and statistically significant at the 1% level, which indicates that firms with access to external financing hold less cash reserves. Cash flow is significantly (at 1%) negatively associated with cash holding. This is consistent with the TOT that having cash flow means having a ready and alternative source of liquidity which reduces the need to hold high levels of cash.

4.2.2 The effect of EPU and GPR on cash holdings in SC versus NSC firms. Columns 3 and 4 of Table 3 show the results of the regression analysis for Models 3 and 4 focusing on whether the impact of EPU and GPR on the level of cash holdings is more pronounced in SC firms. We add the interactions between both WUI and GPR and the Shariah dummy. A significant positive (negative) coefficient for the interaction term indicates that the impact of WUI and GPR on the level of cash holdings is more (less) pronounced in SC firms. The results show significant negative coefficients associated with interactive variables between WUI and Shariah compliance and GPR and Shariah compliance. Contrary to our expectation, these findings show that the effect of EPU and GPR on cash holding level is less prominent in SC firms than NSC firms. This may due to prudent cash politics followed by SC firms and therefore, these firms do not resort to hold excess cash face to EPU and GPR conditions.

4.2.3 The effect of EPU and GPR on cash holdings in less versus more financially constrained firms. We also examine the effect of EPU and GPR on corporate cash holdings considering financial constraints. We introduce interactive variables between both GPR and EPU and financial constraints. The results are reported in columns 5 and 6 of Table 3. We find that the coefficients on interactive variables between WUI and financial constraints and GPR and financial constraints are positive and significant at the 1% level. This implies that cash holding levels of more financially constrained firms are significantly more influenced by WUI and GPR variables than those less financially constrained. These findings largely support the notion that financially constrained firms are more responsive to policy related uncertainty shocks.

The estimates lend further support to the precautionary motive of cash holdings and suggest that financially constrained firms are more likely to increase cash reserves following policy uncertainty shocks than their less financially constrained counterparts. These findings are consistent with those of Tut (2022) who finds that, during periods of policy-related uncertainty, financially constrained firms are likely to save a larger amount of their cash flow for precautionary cash holdings than unconstrained firms. The results are also similar to the findings of Kotcharin and Maneenop (2020) and Lee and Wang (2021) who find the positive impact of GPR on cash holding level is more pronounced in firms with greater financial constraints.

4.2.4 Impact of EPU and GPR on the SOA of cash holdings. In Models 7 and 8, we test whether EPU and GPR affect the SOA of cash holdings. The results are reported in Table 4. Consistent with the precautionary motive hypothesis, we find that the interaction terms have statistically significant (at the 1% level) coefficients and negative signs in the two regression models. This suggests that, during times of high EPU and high GPR, Saudi firms tend to decelerate their SOA. The results show that in periods of high EPU, Saudi firms have a higher speed of cash adjustment of about 0.491 ($1 - (0.668 - 0.159)$) compared to periods of low EPU of 0.332 ($1 - 0.668$). This indicates that corporate cash holding adjusts back to the target level faster during high EPU periods than low EPU periods. A typical firm requires approximately 2.04 ($1/0.491$) years to adjust toward its target level of cash in times of high EPU. In contrast, it can correct about 33.2% of the gap between the actual and target cash levels in a year of low EPU, with an adjustment of 3.01 years. This finding may be explained by the difficult access to external capital as and when required, particularly in periods of high EPU. Thus, firms adjust their cash holdings faster during periods of uncertainties mainly to avoid external costly funds.

Variables	WUI (1)	GPR (2)
<i>Cash (t-1) (a)</i>	0.668*** (25.82)	0.651*** (24.91)
<i>WUI (b)</i>	0.019*** (3.08)	
<i>GPR (c)</i>		0.010*** (2.82)
<i>(a)×(b)</i>	-0.159*** (-2.91)	
<i>(a)×(c)</i>		-0.119*** (-2.87)
<i>MTB</i>	0.019*** (4.38)	0.018*** (4.36)
<i>Capex</i>	-0.443*** (-7.41)	-0.442*** (-7.41)
<i>NWC</i>	-0.212*** (-6.78)	-0.213*** (-6.79)
<i>Lev</i>	-0.140*** (-4.63)	-0.138*** (-4.58)
<i>Size</i>	0.022*** (5.25)	0.022*** (5.25)
<i>CF</i>	-0.053*** (-3.69)	-0.052*** (-3.67)
<i>Constant</i>	0.173*** (3.23)	0.208*** (3.31)
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
AR(1)	0.000	0.000
AR(2)	0.552	0.546
Sargan Test	0.324	0.320
Hansen Test	0.382	0.371
Wald test	350.7	347.6
<i>N</i>	1,802	1,802

Note(s): This table shows the two-step system GMM estimators for the impact of EPU and GPR on the SOA of cash. The z-statistics are reported in parentheses. ***, ** and * indicate significance at 1, 5 and 10%, respectively

Table 4.
Impact of economic uncertainty and geopolitical risks on the SOA

We also find that firms operating under high GPR conditions have a faster SOA 0.468 ($1 - (0.651 - 0.119)$) as compared to low GPR conditions 0.349 ($1 - 0.651$). This implies that Saudi firms need about 2.14 years and about 2.87 years to reach their target level of cash holding in high and low GPR periods, respectively. This indicates that GPR can exacerbate firms' financial constraints and make it difficult to raise external funds. Consequently, firms accelerate their SOA at a faster rate to avoid external costly funds.

Taken together, higher upward speed during periods of EPU and GPR is due to more financial constraints faced by Saudi firms. These periods of significant policy-related uncertainty are highly correlated with an increase in financing frictions and an increase in external financing costs. Accordingly, firms build up cash reserves in anticipation of a rise in financing constraints and the costs of external financing. Our results are consistent with those of previous studies that demonstrated that firms that suffer from market imperfections exhibit higher adjustment speed toward the target cash holdings (e.g. [Orlova & Rao, 2018](#); [Bugshan et al., 2021](#)).

4.3 Robustness tests

To check the robustness of our findings, we conduct the analysis again using different specifications. First, we use the worldwide WUI and GPR that are calculated by [Ahir et al. \(2022\)](#) and [Caldara and Iacoviello \(2018\)](#), respectively. Especially, due to the fact that we examine an emerging economy, it is highly probable that EPU and GPR over the world also have large implications for this economy. The results are given in first two columns of [Table 5](#). We find that WUI Global and GPR Global have positive and significant (at 1% level) effects on cash holding level of Saudi firms. Interestingly, the magnitudes of the coefficients are larger than those in regressions with country specific indices. This indicates that, compared to an increase in WUI and GPR of a country, an increase in global WUI and GPR

Variables	WUI global (1)	GPR global (2)	WUI ($t-1$) (3)	GPR ($t-1$) (4)
<i>Cash ($t-1$)</i>	0.633*** (23.09)	0.627*** (22.19)	0.614*** (21.18)	0.602*** (20.62)
<i>WUI Global</i>	0.028*** (3.34)			
<i>GPR Global</i>		0.017*** (3.08)		
<i>WUI ($t-1$)</i>			0.020*** (3.01)	
<i>GPR ($t-1$)</i>				0.011*** (2.81)
<i>MTB</i>	0.019*** (4.40)	0.016*** (4.28)	0.013*** (4.17)	0.010*** (4.09)
<i>Capex</i>	-0.443*** (-7.42)	-0.446*** (-7.48)	-0.448*** (-7.52)	-0.441*** (-7.38)
<i>NWC</i>	-0.219*** (-6.89)	-0.217*** (-6.71)	-0.216*** (-6.84)	-0.211*** (-6.69)
<i>Lev</i>	-0.143*** (-4.71)	-0.139*** (-4.58)	-0.136*** (-4.50)	-0.133*** (-4.41)
<i>Size</i>	0.021*** (5.24)	0.020*** (5.17)	0.016*** (5.09)	0.015*** (5.04)
<i>CF</i>	-0.047*** (-3.53)	-0.041*** (-3.47)	-0.045*** (-3.51)	-0.042*** (-3.43)
<i>Constant</i>	0.185*** (4.02)	0.114*** (3.61)	0.227*** (4.31)	0.313*** (4.24)
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
AR(1)	0.000	0.000	0.000	0.000
AR(2)	0.462	0.448	0.452	0.383
Sargan Test	0.272	0.202	0.236	0.161
Hansen Test	0.338	0.301	0.322	0.255
Wald test	296.1	310.6	318.3	280.7
<i>N</i>	1,802	1,802	1,802	1,802

Note(s): This table shows the two-step system GMM estimators of the impact of EPU and GPR on cash holding level using alternative measures of EPU and GPR. The z-statistics are reported in parentheses. ***, **, * indicate significance at 1, 5 and 10%, respectively

Table 5.
Robustness check

results in a larger increase of cash holdings of the firms in that country. As pointed out by Demir and Ersan (2017), this demonstrates the dependency and also integration of emerging economies in the rest of the world.

Second, we use the lagged values of WUI and GPR in columns 3 and 4 of Table 5 that summarize the results. Consistent with our baseline result, the coefficients on lagged WUI and lagged GPR remain positive and statistically significant with magnitudes comparable to those in Models 1 and 2.

5. Conclusion

This study is in line with research that seeks to determine the drivers of the firm cash holdings' policy. Through this paper we study the impact of EPU and GPR on cash holdings for nonfinancial Saudi firms from 2002 to 2019. We find evidence in support of the precautionary motive hypothesis. Facing costly external financing induced by economic policy-related uncertainty and geopolitical tension, Saudi firms tend to accumulate cash as a buffer against negative shocks to their cash flows. Holding excess cash can be viewed as a hedging instrument against turbulent economic environment.

In further analysis, we take into consideration the specificity of the legal system in KSA, which is characterized by the influence of Shariah rules. Although companies that comply with Shariah law face higher restrictions on raising external funds, and the positive impact of EPU and GPR on the level of cash holding is less pronounced in these firms. This suggests that SC firms are less responsive to uncertainty shocks. On the other hand, since financially constrained firms tend to face higher costs in accessing external financing, we find that the cash holdings of these companies are significantly more affected by geopolitical and economic uncertainty variables.

In addition, firms adjust their cash holdings faster during periods of high EPU and GPR mainly to avoid external costly funds.

This study adds to the existing literature by providing an examination of the management of cash holding policy in reaction to uncertainties. The implications of this study are very important for academicians, managers, policymakers and regulators. First, this study can be useful to academicians to understand the financial implications of EPU and GPR on corporate cash holdings. Second, this study will help managers to focus on internal funds for their financing needs during uncertain times because EPU and GPR increase the cost of external finance. Third, this study may be useful for policymakers and regulators to assess the effect of economic instability on firm's cash holding decision and to make appropriate policy measures that reduce the negative effects of EPU and GPR on corporate financing decisions.

Many intriguing research avenues can be envisaged to deepen our empirical findings. This study can be extended by introducing sectors in order to identify those which are most likely to be impacted by major events. Also, we can test the adjustment cash holdings level in case of predictable and unpredictable shocks.

Notes

1. The Dow Jones Islamic Index identifies two restrictions on firms to be classified as SC. First, firms can only trade in products and services that are permissible (halal) according to Shariah law. The second restriction imposed on SC firms is that – debt, cash and interest-bearing investments and accounts receivables – all of which have to be below 33% of the total value of the firm's market capitalization over the previous 12 months.
2. <https://www.argaam.com>.
3. Data about economic uncertainty are available on <http://www.policyuncertainty.com>.
4. Data about geopolitical risk are available on <http://www.bc.edu/matteo-iacoviello/gpr.htm>.
5. SC firms are companies whose objectives and activities are permissible but may have illicit matters in their dealings, such as dealing in usurious interest-bearing loans or deposits. The Shariah Board has approved the permissibility of investment and trading in the stocks of these companies, subject to the following safeguards and controls: Total amount of interest-bearing (long or short term) loans shall not exceed 30% of the total market value of assets of the borrowing company. The earnings generated from the illicit component shall not exceed 5% of the total earnings of the respective company, whether such earnings are generated from interest bearing investment or from the practice of illicit activity, ownership of an illicit item or otherwise.

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