Domestic Economic Policy Uncertainty, US Macroeconomic Uncertainty and Corporate Cash Holdings: International Evidence

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Abstract: This study examines the impact of two different types of uncertainty, which are domestic economic policy uncertainty and macroeconomic uncertainty stemming from the United States (US) on corporate cash holdings. Using a sample of 18 countries from 2003 to 2023, we find that both types of uncertainty positively associated with corporate cash holdings due to precautionary motives. Our results demonstrate that the US macroeconomic uncertainty has a greater influence over domestic economic policy uncertainty on corporate cash holdings decision. Further analysis indicates that the influences of both types of uncertainty on corporate cash holdings are more pronounced in developed countries.

Keywords: Corporate cash holdings, domestic economic policy uncertainty, precautionary motives, US macroeconomic uncertainty
JEL classification: G18, G32, G38, E3, E6, E44

1. Introduction

The issue of uncertainty has gained increased attention in light of several major challenges that have recently emerged, leading to an unprecedented rise in uncertainty. Figure 1 shows the World Uncertainty Index spiked around major events like the Gulf Wars, the US recession, the 9/11 terrorist attack, the Iraq war, the SARS outbreak, the Euro debt crisis, the Brexit, the US presidential elections, and the US-China trade tensions. The recent outbreak of COVID-19 brought global uncertainty to

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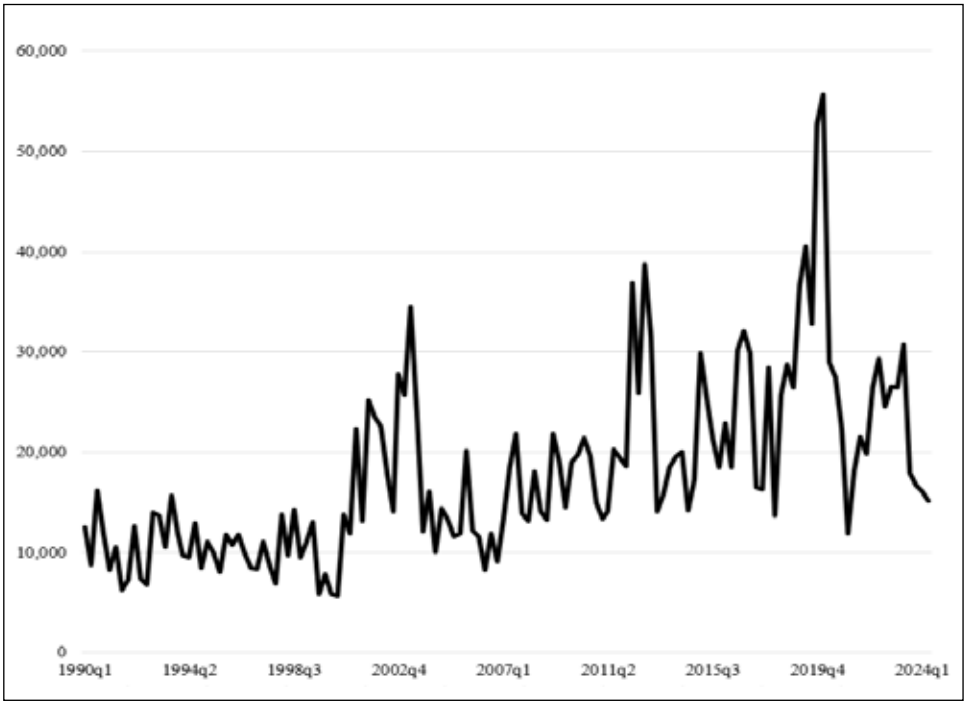

Figure 1. World Uncertainty Index
Source: Ahir et al., 2022.

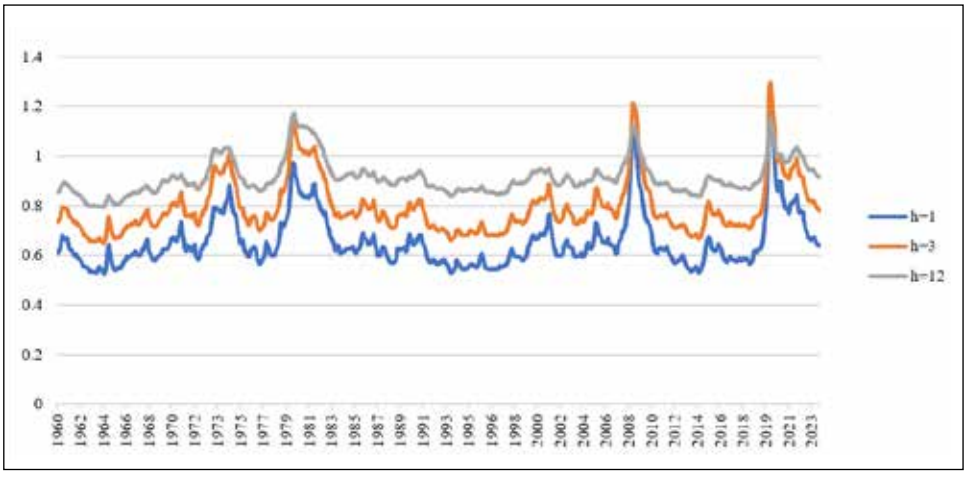

Figure 2. US Macroeconomic Uncertainty Index
Note: h = 1, 3 and 12 represent the uncertainty about the US macroeconomics for one month, three months and twelve months ahead, respectively.
Source: Jurado et al., 2015.

unprecedented levels. Despite the index falling sharply afterward, it surged again as the Ukraine war unfolded, alongside recent geopolitical tensions and the collapse of the Silicon Valley Bank, Signature Bank and Credit Suisse. Similarly, the US Macroeconomic Uncertainty Index by Jurado et al. (2015), based on forecast errors in numerous macroeconomic series, exhibits a similar pattern, as demonstrated in Figure 2.

The heightened uncertainty has been proven to cause adverse profound impacts on economic growth. For instance, Bloom (2009) demonstrated that the jump in uncertainty that occurred during the global financial crisis has caused a severe total output loss in the 2007–09 recession. McNabb (2013) also revealed that the economic policy uncertainty in the US has led to more than one-percentage-point drop in the country's real gross domestic product (GDP) and a total loss of over one million jobs over the period of 2011 to 2012. Given the unfavourable impacts of uncertainty on the economy, it is important to understand how the uncertainty is likely to influence financial decisions of firms. Prior studies have researched the potential impact of uncertainty on various firms' activities such as capital investment (Bloom, 2009; Gulen & Ion, 2016; Julio & Yook, 2012), R&D investment (Wang et al., 2017), leverage ratios (Zhang et al., 2015), debt and equity issuances (Gulen & Ion, 2016), innovation activities (Bhattacharya et al., 2017), and corporate merger and acquisition activities (Bonaime et al., 2018; Nguyen & Phan, 2017). Yet, studies on the cash holdings policy in response to uncertainty remain underexplored.

Cash holdings decision is one of the most critical decisions of the firm to decide the amount of cash to be reserved to fund daily operations, finance investments and hedge risk (Acharya et al., 2007; Almeida et al., 2004; Opler et al., 1999). Sufficient cash reserves allow firms to avoid expensive external financing costs and capture investment opportunities, whereas a cash shortage could cause firms to face financial distress (Opler et al., 1999). However, holding excessive cash may incur carrying costs, agency costs and taxes for firms (Faulkender & Wang, 2006), or cause firms to forgo the opportunities for value creation (Minton & Schrand, 1999; Ozkan & Ozkan, 2004). Thus, Opler et al. (1999) developed the tradeoff theory to explain the tradeoff between the benefits and costs of holding cash in deciding the optimal amount of cash to be reserved. The tradeoff theory not only considers the transaction costs of fundraisings in the case of cash shortfall, which explains the transaction costs motive of cash holdings (Dittmar et al., 2003; Guizani, 2017; Ozkan & Ozkan, 2004), but also suggests the precautionary motive of firms to hold cash due to information asymmetries (Myers & Majluf, 1984; Ozkan & Ozkan, 2004), and financial constraints (Almeida et al., 2002; Dittmar et al., 2003; Han & Qiu, 2007). Building upon the tradeoff theory and the motives of cash holdings, existing studies investigated a broad range of determinants that affect the cash holdings decision of firms. The determinants vary from firm-specific, industry-specific, to country-specific characteristics. However, less attention has been paid to the policy-related and macroeconomic-specific characteristics. This study aims to fill this void by exploring the potential influences of domestic economic policy uncertainty and the US macroeconomic uncertainty on corporate cash holdings.

Prior studies generally show that uncertainty affects the firms' activities through two channels. First, the real options effect (e.g., Bloom, 2009; McDonald & Siegel, 1986), which suggests that the option value of waiting and postponing firms' investments

and expenditures is higher during uncertain periods. Second, the risk premium and risk aversion effect (e.g., Bloom, 2014; Christiano et al., 2014; Panousi & Pananikolaou, 2012), which explains that managers are more conservative when uncertainty is high. In fact, most studies confirm the real options effect and the risk aversion effect by showing that uncertainty indeed limits firms' activities, such as in acquisitions (e.g., Nguyen & Phan, 2017), innovations (e.g., Bhattacharya et al., 2017), investments and financings (e.g., Gulen & Ion, 2016). Based on the real options effect, the risk aversion effect, and the trade-off theory, we expect both domestic policy uncertainty and US macroeconomic uncertainty to increase corporate cash holdings globally.

We begin by examining the influence of domestic economic policy uncertainty on corporate cash holdings across multiple countries. Similar to recent studies (Duong et al., 2020; Phan et al., 2019), we use the economic policy uncertainty index (EPU) developed by Baker et al. (2016) as a measure of domestic economic policy uncertainty. Using a sample of 18 countries that possess a complete EPU index over the period 2003–2023, we find that domestic economic policy uncertainty is positively related to corporate cash holdings.

The issue of uncertainty in the US is of very much concerned to the media, policymakers, investors and academicians as it is found any uncertainty that emerged from some of the world's large economies like the US or the European Union would spill over to other countries and cause the uncertainty in other countries to rise and consequently, affect their economic activities. Ahir et al. (2022) asserted that the US-related uncertainty has contributed to about 13% of uncertainty in other countries in the past four years with an approximately 20% increase in the world uncertainty from the historical mean. Other previous studies found that the uncertainty shock in the US would significantly affect the inflation and output of European countries (Colombo, 2013), the unemployment rate in the G7 countries (Caggiano et al., 2017), and the economy of some major countries and New Zealand (Kamber et al., 2016). Given the evidence presented above, it is important to take into account the uncertainty surrounding the United States, as it has the potential to significantly affect the economic activities of other countries, thereby impacting firm activities. Therefore, we extend our analysis to investigate how US macroeconomic uncertainty affects a firm's decision to hold cash and to compare this impact with the effects of domestic economic policy uncertainty. We adopt the comprehensive US macroeconomic uncertainty index (USMUI) developed by Jurado et al. (2015) as a measure of US macroeconomic uncertainty and exclude the United States from our analysis. We find a significant increase in corporate cash reserves in response to US macroeconomic uncertainty, and the growth in corporate cash reserves is more significant than that of domestic economic policy uncertainty. This suggests that managers tend to be more risk-averse in their corporate cash holdings policy when faced with uncertain conditions in the US compared to when they encounter economic policy uncertainty within their own country.

In addition, we have conducted several tests to ensure the robustness of our findings. Firstly, we replace our corporate cash holdings with alternative measures and re-analyse our regression models. Secondly, we replaced the US macroeconomic uncertainty with US financial uncertainty and US real uncertainty to gauge if other types of uncertainty originating from the US will create a similar impact. Our findings remain

generally consistent and qualitatively unchanged. Furthermore, we conducted a more in-depth analysis of the influences of both domestic economic policy uncertainty and US macroeconomic uncertainty on corporate cash holdings in developed and emerging countries. Our results indicate that the impact of both domestic economic policy uncertainty and US macroeconomic uncertainty on corporate cash holdings is more significant in developed countries compared to emerging countries.

Our study contributes to the corporate cash holdings literature by highlighting both domestic economic policy uncertainty and US macroeconomic uncertainty as potential drivers of corporate cash holdings. We also uncover that the precautionary motives of firms are greater when responding to the uncertainty emerging from the US compared to the economic policy uncertainty that arises domestically. Our findings provide important implications for corporate managers, investors and policymakers. This is especially relevant in light of their strong interest in maintaining business growth, safeguarding investment portfolios, and ensuring economic growth and job creation during uncertain periods. This is particularly crucial given the recent significant rises in economic policy uncertainty and US macroeconomic uncertainty.

2. Hypothesis Development

2.1 Economic Policy Uncertainty and Corporate Cash Holdings

This section formulates the hypothesis on how economic policy uncertainty affects corporate cash holdings. This hypothesis is premised on the tradeoff theory of corporate cash holdings which emphasises the tradeoff between the benefits and the costs of hoarding cash due to several motives. First, the transaction cost motive underlines the need of hoarding cash to service transactions that arise from daily operations (Dittmar et al., 2003; Guizani, 2017; Ozkan & Ozkan, 2004). Second, the precautionary motive accentuates that firms may also hold cash to safeguard from any unanticipated contingencies that may arise (Acharya & Pollock, 2013; Almeida & Campello, 2010; Bates et al., 2009; Bliss et al., 2015; Francis et al., 2014). Third, the speculative motive suggests that firms speculate growth opportunities may develop in the future, and hence accumulate cash in order to grab profit-making opportunities (Bates et al., 2009; Dittmar et al., 2003). In the context of uncertainty, the precautionary motives of corporate cash holdings are well evidenced in many studies. A growing literature affirms that an uncertain macroeconomic environment would diminish asset returns and increase the external equity financing costs of firms (Brogaard & Detzel, 2015; Gungoraydinoglu et al., 2017) or inhibit firms' access to loan finance (Alessandri & Bottero, 2016; Bordo et al., 2016), all of which exacerbate the financial constraints of firms (Gilchrist et al., 2014). Following this notion, Phan et al. (2019) found that firms indeed reduce their net equity and debt issues during high uncertainty periods. Considering the difficulty in attaining external financing and higher costs of capital during the periods of high uncertainty, firms are more likely to hold more cash as a precaution to alleviate the refinancing risk (Harford et al., 2014), to buffer against financial shocks, to maintain smooth operations, and to avoid any adverse consequences from fund shortage (Cummins & Nyman, 2004; Phan et al., 2019).

Despite the carrying cost of holding cash, the tradeoff theory suggests that when a firm faces greater friction in raising outside funds, it is more cost-effective to hold cash as a precaution (Harford et al., 2014; Opler et al. 1999).

Moreover, from the perspectives of risk aversion and real option asserted in the uncertainty literature, studies contend that managers are more cautious and generally hold back firms' investments when uncertainty is high (Bloom, 2014; Panousi & Pananikolaou, 2012). The reason being the managers would "wait-and-see" until the uncertainty recedes as they realise that it would be costly to raise external funds to invest amid uncertainty periods, and the cost to reverse investments is very high if the outcomes are unfavourable, and hence, the option value of waiting is higher during the uncertain periods (Gulen & Ion, 2016; Nguyen & Phan, 2017). In fact, empirical evidence document that firms tend to hold more cash as precautionary measure when they face greater firm-specific uncertainty, macroeconomic uncertainty and economic policy uncertainty (Baum et al., 2008; Demir & Ersan, 2017). In addition, studies have further proven that firms are incline to cut their capital expenditures, R&D investments, and dividend payout to accumulate more cash during uncertain periods (Duong et al., 2020; Gulen & Ion, 2016; Phan et al., 2019). The above literature generally indicate that uncertainty has a positive association with corporate cash holdings and hence, these propositions lead to the formation of our first hypothesis as follows:

H1: Domestic economic policy uncertainty has a positive effect on corporate cash holdings.

2.2 US Macroeconomic Uncertainty and Corporate Cash holdings

It is also worth noting that corporate cash holdings are positively associated with different types of uncertainty, such as firm-level uncertainty (e.g., Baum et al., 2006; Wright, 2015), stock market uncertainty (e.g., Istrefi & Piloiu, 2014; Pinkowitz et al., 2003), inflation uncertainty (e.g., Baum et al., 2006; Bhaduri & Kanti, 2011), real GDP uncertainty (e.g., Baum et al., 2008), environmental uncertainty (e.g., Orens & Reheul, 2013), and the commonly examined economic policy uncertainty (e.g., Demir & Ersan, 2017; Duong et al., 2020; Graham & Leary, 2018; Gulen & Ion, 2016), which further strengthen the notion of the precautionary motive of corporate cash holdings during the uncertain periods. Although the association between uncertainty and corporate cash holdings behaviour has been intensively investigated (e.g., Duong et al., 2020; Phan et al., 2019), previous research mostly considers the uncertainty in single or few aspects like domestic stock market index, inflation, or real GDP, which may not fully indicate the true impact of uncertainty on corporate cash policy. Similarly, the economic policy uncertainty considered in recent studies (e.g., Duong et al., 2020; Phan et al., 2019) has primarily focused on economic policy uncertainty arising within the domestic country. However, these studies have overlooked the potential spread of uncertainty shocks originating from major global economies like the United States or the European Union.

Research indicates that uncertainty originating from major economies, such as the United States, can lead to increased uncertainty in other countries (Ahir et al., 2022). Moreover, this uncertainty from the US can significantly impact the inflation, output,

employment and overall economy of other countries (Caggiano et al., 2017; Colombo, 2013; Kamber et al., 2016). Given the spillover effect of US uncertainty, it is essential to consider the influence of US macroeconomic uncertainty while examining the impact of domestic economic policy uncertainty on corporate cash holdings. On the other hand, as suggested by Gao et al. (2014), rather than considering the idiosyncratic aspect, the overall uncertainty in the macroeconomic components has a greater essential effect on corporate cash holdings. In line with this notion, we contend that Jurado et al. (2015)'s US macroeconomic uncertainty index, USMUI thereafter, has a greater influence over domestic economic policy uncertainty due to two reasons. First, the construction of the USMUI index is more comprehensive as it covers real activities, price and market-based uncertainty. Unlike the USMUI index, the construction of the EPU index itself is mostly subjected to the reflections of journalists' thoughts on the economy and could be exaggerated on specific events, thus the economic policy uncertainty may not well represent the whole economy and the true influence of uncertainty on corporate cash holdings. Second, policymakers shape policy based on real-time market happenings, for example, the financial market, whereby managers make decisions on whether to hold more or less cash based on market-based uncertainty, such as what is happening in the economy or the stock market. If there is substantial uncertainty, they will opt to hold more cash. Conversely, they are less likely to base their cash-holding decisions on government policy, as this would require them to trace back through previous policies to identify any differences compared to the latest policy.

Given the dominant influence of the US economy on global real and financial markets, this study diverges from previous studies by examining and comparing the effects of both domestic economic policy uncertainty and US macroeconomic uncertainty on corporate cash holdings. Additionally, we posit that US macroeconomic uncertainty generally outweighs local economic policy uncertainty in influencing corporate cash holdings in other countries. Thus, our second hypothesis is as follows:

H2: Macroeconomic uncertainty from the United States has a greater influence than the country's own economic policy uncertainty over corporate cash holdings in the respective country.

3. Data and Methodology

3.1 Data

This study utilises panel data that focuses on public listed firms for 18 countries, which are Australia, Brazil, Canada, Chile, China, France, Germany, Greece, India, Ireland, Italy, Japan, Russia, Singapore, South Korea, Spain, United Kingdom and the United States. These 18 countries are selected as they were covered by the economic policy uncertainty (EPU) index. The sample period covers from year 2003 to 2023. The starting point of the data is 2003 as it was the earliest year where the EPU index is available for all the sample countries selected. Despite the EPU index also covered other countries such as Belgium, Colombia, Denmark, Hong Kong, Mexico, Netherlands, New Zealand, Nigeria and Sweden, these countries are not included in our study because the EPU

index of these countries is not complete, whereas Croatia and Pakistan are excluded due to the unavailability of the firm-level data in the LSEG (London Stock Exchange Group) Datastream database.

Firms from the financial (SIC 6000–6999) industry are excluded because these firms have different financial structures, accounting practices and regulations requirements that may cause biased results. This study also excludes utility firms (SIC 4900–4999) because their cash holdings are regulated by states. Following the studies by Almeida and Campello (2007) and Duong et al. (2020), firms with negative assets, negative sales, negative market-to-book ratio, or market-to-book ratio greater than 10 are excluded. Moreover, firms with sales growth exceeding 100% are also excluded due to the possibility of this growth caused by major corporate events such as mergers and acquisitions. To prevent sample selection issues, this study does not restrict to a balanced panel, therefore the number of observations for every firm may not be the same. Applying the above filters results in a final sample of 163,729 firm-year observations. Table 1 shows the sample attrition of this study.

The data is obtained from four specific sources: (i) LSEG Datastream database, (ii) Baker, Bloom and Davis's website, (iii) Sydney Ludvigson's website, and (iv) World Bank. The firm-level financial and accounting data are extracted from the LSEG Datastream database to construct the corporate cash holding variable, and the firm-level control variables. The country-level control variables are extracted from the DataBank provided by the World Bank Group (https://databank.worldbank.org/source/world-development-indicators). The EPU index is extracted from the website developed by Professor Baker, Professor Bloom and Professor Davis (https://www.policyuncertainty.com/index.html), while the US macroeconomic uncertainty index data is commercially available and is collected from the website developed by Professor Sydney Ludvigson (https://www.sydneyludvigson.com/).

3.2 Variable Construction and Regression Models

3.2.1 Corporate Cash Holdings

Following previous research, this study measures corporate cash holdings as the ratio of cash and marketable securities to net assets (book value of total assets minus cash and marketable securities) (Bates et al., 2009; Demir & Ersan, 2017; Dittmar et al., 2003; Opler et al., 1999; Phan et al., 2019). As per Opler et al. (1999), the firm's cash and marketable securities are deflated by the net assets because it is assumed that the ability of the firm to generate future profits is associated with the function of its assets in place.

3.2.2 Economic Policy Uncertainty

Economic policy uncertainty (EPU) has been a popular measure for uncertainty in recent literature. EPU is a news-based weighted measure developed by Baker et al. (2016) which was built upon three components, which are the frequency of newspaper articles referencing policy and economic uncertainty, disagreement among forecasters on future government spending and inflation, and the uncertainty about the changes in federal

Table 1. Sample attrition

Attrition procedure	Firm-years observations of each country (2003–2023)																		Total obs.
	AUS	BRA	CAN	CHL	CHN	FRA	DEU	GRC	IND	IRL	ITA	JPN	RUS	SGP	KOR	ESP	GBR	USA	
Initial observations from LSEG Datastream database	10,460	88	32,504	26	3,496	3,364	3,468	497	22	492	1,437	15,075	4,023	2,445	84	1,197	9,232	137,958	225,868
(-) Firm-years from financial and utility industries	1,240	26	3,622	2	671	522	566	195	0	95	459	1,927	748	868	0	335	1,832	17,122	30,230
(-) Firm-years with negative assets, sales, or market-to-book ratio	10	0	248	2	20	0	0	0	0	3	0	0	160	0	0	0	6	18,449	18,898
(-) Firm-years with market-to-book ratio greater than 10	1	0	79	0	26	0	0	0	0	7	0	0	59	10	0	0	3	5,877	6,062
(-) Firm-years with sales growth over 100%	1,510	2	1,300	0	89	80	68	6	0	13	7	122	67	26	1	15	330	3,313	6,949
Final amount of observations	7,699	60	27,255	22	2,690	2,762	2,834	296	22	374	971	13,026	2,989	1,541	83	847	7,061	93,197	163,729

Note: AUS represents Australia, BRA represents Brazil, CAN represents Canada, CHL represents Chile, CHN represents China, FRA represents France, DEU represents Germany, GRC represents Greece, IND represents India, IRL represents Ireland, ITA represents Italy, JPN represents Japan, RUS represents Russia, SGP represents Singapore, KOR represents South Korea, ESP represents Spain, GBR represents United Kingdom, USA represents United States, obs represents observations.

tax codes. The EPU index is found to be correlated with major policy-related events such as stimulus debates, debt ceiling disputes, wars, financial crises and elections. It has been proven that the frequency of the uncertainty-related keywords surge in the period of uncertainty. This proxy is well-known and notable in many works of literature on uncertainty (e.g., Bhagat et al., 2016), including recent research that examine the impact of uncertainty on corporate cash holdings such as Duong et al. (2020) and Phan et al., (2019). Following prior studies, we construct the domestic EPU by taking the natural logarithm of the average of monthly EPU index for a given year.

3.2.3 US Macroeconomic Uncertainty

We next include Jurado et al. (2015)'s forecast and estimation based-proxy as the primary measure of US macroeconomic uncertainty. Technically, Jurado et al. (2015) considered 132 macroeconomic data variables and 147 financial data variables of the United States to compute the co-movement in their unforecastable components. Specifically, the selected 132 macroeconomic variables represent 3 broad categories – real activities, price and finance – that cover 13 aspects, which are consumer spending, manufacturing and trade sales, housing starts, employment and hours, real output and income, real retail, orders and unfilled orders, foreign exchange measures, capacity utilisation measures, inventories and inventory sales ratios, compensation and labour costs, bond and stock market indexes, and price indexes of the United States. The US macroeconomic uncertainty index has been widely used in past literature (e.g., Duong et al., 2020; Gulen & Ion, 2016; Nguyen & Phan, 2017), to capture and control the influence of macroeconomic uncertainty on corporate activities in the United States.

3.2.4 Regression Models

Our first cash holdings regression model is similar to the one adopted by previous studies (e.g., Dittmar et al., 2003; Duong et al., 2020; Phan et al., 2019) which is built upon incorporating EPU as the possible determinant for cash holdings model, as follows:

$$Cash_{it} = \alpha + \beta_1 EPU_{it-1} + \sum_j^k \beta_j CONTROL_{it} + firm + industry + country + \varepsilon_{it} \quad (1)$$

In line with previous research, the economic policy uncertainty is lagged by one period to mitigate the endogeneity concern (Duong et al., 2020; Gulen & Ion, 2016; Phan et al., 2019).[1]

CONTROL includes the firm-level and country-level control variables, which are market value (MV), market-to-book ratio (MTBV), leverage (LEV), capital expenditures (CAPEX), dividend payout (DIV), sales growth (ΔSALE), net working capital (NWC), firm

[1] Research shows that uncertainty can impact firms' financial decisions with a lag (Cui et al., 2021; Demir & Ersan, 2017; Duong et al., 2020; Phan et al., 2019). In particular, Demir and Ersan (2017) argued that the influence of economic policy uncertainty on corporate cash holdings may not be immediately evident, as financial decisions are often made in advance and firms may require time to adjust to changes in uncertainty levels. This could result in changes in cash holdings in the subsequent year.

size (SIZE), cash flow (CF), domestic private credit (CREDIT), stock market capitalisation (MCAP), trade openness (TRADE), GDP growth rate (GDPgrow), GDP per capita (GDPcap) and foreign exchange rate (FOREX). α is the intercept or constant term, β is the coefficient of variable, and ε is the error term that captures all unobserved factors that impact corporate cash holdings. *i* indicates the cross-sectional dimension for firms whereas *t* indicates the time-series dimension. Model 1 shows the relationship between EPU, control variables and corporate cash holdings. The model includes firm-fixed effects and firm clustering effects to control for time-invariant firm characteristics. We do not include year fixed effects as the EPU index is identical for all firms in a given year.

Next, we add the US macroeconomic uncertainty variable into model 1 and is shown as follows:

$$CASH_{it} = \alpha + \beta_1 EPU_{it-1} + \beta_2 USMUI_{t-1} + \sum_j^k \beta_j CONTROL_{it} + firm + industry + country + \varepsilon_{it} \quad (2)$$

where USMUI represents Jurado et al. (2015)'s forecast and estimation based-proxy for macroeconomic uncertainty of the United States. Model 2 is set to examine the second hypothesis, which is to compare the effect of domestic economic policy uncertainty versus US macroeconomic uncertainty on corporate cash holdings after controlling the other determinant of cash holdings. The US macroeconomic uncertainty index, USMUI, developed by Jurado et al. (2015) consists of 1, 3 and 12 months ahead (h = 1, 3 and 12). All h-period ahead of indexes are in monthly frequency, thus each h-period ahead index is averaged over 12 months. We then take natural logarithm of the average of monthly US macroeconomic uncertainty index and include it as the second independent variable in our second model. We test model 2 with each h-period ahead US macroeconomic uncertainty index to examine the second hypothesis. Similar to domestic economic policy uncertainty, US macroeconomic uncertainty is lagged by one period to mitigate the endogeneity concern. Also, it is noteworthy that only 17 countries are included, with the United States being excluded because we intend to observe the influence of macroeconomic uncertainty originating from the United States on corporate cash holdings in other countries. In model 2, we observe the influence of two different types of uncertainty – domestic economic policy uncertainty and US macroeconomic uncertainty, on corporate cash holdings. Definitions of the variables used in our models are summarised in Table 2.

4. Results and Discussion

4.1 Descriptive Statistics and Correlation Matrix

Table 3 reports the summary statistics of our test variables. We winsorize all continuous variables (except economic policy uncertainty, US macroeconomic uncertainty and country-level controls) at 1% and 99% levels. After winsorizing, the mean of corporate cash holdings (CASH) is 0.7031, suggesting that firms around the world generally hold a lot of cash in their assets. The domestic economic policy uncertainty (EPU) in every country has an average value of 5.0095. On the other hand, the US macroeconomic

Table 2. Description of variables

Variables	Variable name	Description
CASH	Corporate cash holdings	The ratio of corporate cash and marketable securities to the net assets, where net assets are defined as the book value of total assets minus cash.
EPU	Economic policy uncertainty	The natural logarithm of average monthly Baker et al. (2016)'s economic policy uncertainty index in a given year.
USMUI	US macroeconomic uncertainty	The natural logarithm of average monthly Jurado et al. (2015)'s US macroeconomic uncertainty index in a given year.
MV	Market value	The natural logarithm of the market value of equity.
MTBV	Market-to-book ratio	The ratio of total assets minus total common equities plus market value of equities to total assets.
LEV	Leverage	The ratio of total debts to total assets.
CAPEX	Capital expenditures	The ratio of capital expenditures to total assets.
DIV	Dividend payout	A dummy variable equals to one if firm pays a common dividend.
ΔSALE	Sales growth	The ratio of firm's sales at time t minus sales at time t-1 deflated by sales at time t.
NWC	Net working capital	The ratio of current assets minus current liabilities and cash and marketable securities to total assets.
SIZE	Firm size	The natural logarithm of the total assets.
CF	Cash flow	The ratio of earnings after interests, dividends and taxes before depreciations to total assets.
CREDIT	Domestic private credit	The ratio of domestic private credit to GDP extracted from World Bank.
MCAP	Stock market capitalisation	The ratio of stock market capitalisation to GDP extracted from World Bank.
TRADE	Trade openness	The ratio of exports plus imports over GDP extracted from World Bank.
GDPgrow	GDP growth rate	Annual GDP growth rate extracted from World Bank.
GDPcap	GDP per capita	The natural logarithm of GDP in USD extracted from World Bank.
FOREX	Foreign exchange rate	Country's exchange rate per US dollar.

Table 3. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
CASH	132,977	0.7031	2.8152	0	23
EPU	163,729	5.0095	0.4612	3.7621	6.5058
USMUI (h=1)	163,729	-0.3876	0.1694	-0.5918	0.0174
USMUI (h=3)	163,729	-0.2047	0.1374	-0.3715	0.1102
USMUI (h=12)	163,729	-0.0776	0.0679	-0.1623	0.0656
MV	40,821	3.8441	3.2388	-10.2921	10.6432
MTBV	163,729	0.7359	1.6031	0	10
LEV	133,746	0.2314	0.3898	0	3.0659
CAPEX	133,746	0.0512	0.0764	0	0.4644
DIV	163,729	0.3327	0.4712	0	1
ΔSALE	163,729	0.0435	0.2369	-1	1
NWC	133,746	0.0919	1.0196	-8.1750	0.9490
SIZE	65,978	11.8806	3.5593	-0.3401	18.5759
CF	133,746	-0.1409	0.8509	-6.6000	0.3723
CREDIT	140,095	1.7156	0.3676	0.2124	2.2113
MCAP	149,464	1.5927	0.7457	0.0308	3.5552
TRADE	156,900	42.7813	36.5978	21.3261	437.3267
GDPgrow	163,729	0.0201	0.0242	-0.1117	0.2448
GDPcap	163,729	10.7849	0.4253	6.4363	11.5520
FOREX	163,729	11.7073	41.4497	0.4923	1303.9000

Note: This table reports the descriptive statistics of the full sample. CASH is corporate cash holdings. EPU is domestic economic policy uncertainty within the country. USMUI (h=1), USMUI (h-3), and USMUI (h=12) are the US macroeconomic uncertainty index for 1, 3 and 12 months ahead. MV is the market value of equity of firm. MTBV is the market-to-book ratio of firm. LEV is the leverage of firm. CAPEX is the capital expenditures of firm. DIV is the dividend payout of firm. ΔSALE is the sales growth of firm. NWX is the net working capital of firm. SIZE is the firm size. CF is the cash flow of firm. CREDIT is the domestic private credit of the country. MCAP is the stock market capitalisation of the country. TRADE is the trade openness of the country. GDPgrow is the GDP growth rate of the country. GDPcap is the GDP per capita for the country. FOREX is the foreign exchange of the country per US dollar. The definition of the variables is reported in Table 2.

uncertainty (USMUI) has an average value of -0.3876, -0.2047 and -0.0776,[2] and a standard deviation of 0.1694, 0.1374 and 0.0679 for h=1, 3 and 12, respectively. These statistics indicate that the US macroeconomic uncertainty generally increases as the forecast horizon (h period) expands, but its variability declines due to the forecast approaching the unconditional mean as the horizon extends (Jurado et al., 2015).

Table 4 reports the correlation matrix of all variables used in the main analysis. The correlation matrix shows that multicollinearity does not pose a significant concern. We observe a negative correlation between domestic economic policy uncertainty and corporate cash holdings, and a positive correlation between the US macroeconomic

[2] The average value of US macroeconomic uncertainty for h=1, 3 and 12 are negative due to the natural logarithm.

Table 4. Correlation matrix

	CASH	EPU	USMUI (h=1)	USMUI (h=3)	USMUI (h=12)	MV	MTBV	LEV	CAPEX	DIV
CASH	1									
EPU	-0.0358	1								
USMUI (h=1)	0.0361	0.2406	1							
USMUI (h=3)	0.0354	0.2377	0.9990	1						
USMUI (h=12)	0.0357	0.2481	0.9892	0.9942	1					
MV	-0.1027	0.1790	-0.0246	-0.0245	-0.0248	1				
MTBV	-0.0148	0.0535	-0.0289	-0.0284	-0.0324	-0.1690	1			
LEV	-0.0815	0.0811	0.0093	0.0086	0.0064	0.0950	0.0697	1		
CAPEX	-0.0637	-0.1408	0.0045	0.0083	s0.0089	-0.0264	-0.0233	-0.0372	1	
DIV	-0.1460	0.0683	-0.0830	-0.0859	-0.0866	0.2502	-0.1340	0.0590	-0.1991	1

Table 4. Continued

	ΔSALE	NWC	SIZE	CF	CREDIT	MCAP	TRADE	GDPgrow	GDPcap	FOREX
ΔSALE	1									
NWC	0.0428	1								
SIZE	0.1734	-0.0425	1							
CF	0.1955	0.3278	0.3927	1						
CREDIT	-0.0454	0.0814	0.2044	0.0153	1					
MCAP	-0.0024	0.0429	0.2282	0.0347	0.6430	1				
TRADE	0.0397	-0.0584	0.0973	0.0272	-0.2727	-0.1344	1			
GDPgrow	0.1175	-0.0663	-0.0460	-0.0130	-0.1804	0.0220	0.1951	1		
GDPcap	-0.1017	0.0601	-0.0315	-0.0896	0.2374	-0.1239	0.1448	-0.4111	1	
FOREX	0.0211	0.0695	0.1662	0.1005	0.3045	0.2267	-0.1706	-0.2301	-0.0257	1

Note: This table presents the correlation matrix for the main variables used in the analysis.

uncertainty indices for the three forecast horizons (h=1, 3 and 12) and cash holdings. Despite the unexpected negative correlation between domestic economic policy uncertainty and corporate cash holdings, the positive correlation between the US macroeconomic uncertainty and corporate cash holdings offers preliminary support for a positive relationship between the US macroeconomic uncertainty and corporate cash holdings. However, it's important to interpret these findings cautiously as correlations do not reflect the causality between the variables. The relationships between all the explanatory variables and the dependent variable will be further verified in the regression analyses.

4.2 Different Types of Uncertainty and Corporate Cash Holdings

Table 5 presents the regressions associated with Model 1. The key explanatory variable of interest is the domestic economic policy uncertainty, EPU. Column (1) only includes EPU and firm fixed effect, firm-level control variables are further incorporated in Column (2). To facilitate the comparison of the economic magnitudes across the variables of interest, all variables are normalised by their standard deviation following Duong et al. (2020), Gulen and Ion (2016) and Mitton (2024).[3] The results suggest that an increase in domestic economic policy uncertainty is associated with higher corporate cash holdings in the following year, manifested by the significantly positive coefficient of EPU (0.0250 and 0.1855) in Columns (1) and (2). We then augment our model by adding six country-level control variables and further include country and industry-fixed effects to control for country and industry-wide common factors. The findings are presented in Columns (3) to (5). The results indicate that the estimated coefficient of domestic economic policy uncertainty remains positive at 0.0304, and is statistically significant at the 5% level. This suggests that the positive effect of EPU on corporate cash holdings persists even after controlling for potential influence from country-specific factors. The EPU coefficient value of 0.0304 indicates when domestic economic policy uncertainty increases by 100%;[4] firms, on average, increase their corporate cash holdings by 0.0304 standard deviations, which is equivalent to 12.17% (0.0304*2.8152/0.7031) increase in average corporate cash holdings in the sample. These findings imply that domestic economic policy uncertainty generally induces firms within the country to increase their cash holdings. This aligns with the concept of real options and the perspective of risk premium, indicating that managers tend to adopt a more conservative approach by reducing investment and hoarding more cash during periods of economic policy uncertainty (Bloom, 2014; Panousi & Pananikolaou, 2012). Managers generally acknowledge the higher option value of holding more cash as a precaution to mitigate potential adverse consequences resulting from uncertain policies (Gulen & Ion, 2016; Harford et al., 2014; Nguyen & Phan, 2017).

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[3] We thank an anonymous referee for suggesting normalising the variables to allow for a clearer comparison of the economic magnitude of the variables.

[4] Given that we use the log of domestic economic policy uncertainty measures, the coefficient of EPU variable can be interpreted as the number of standard deviation changes in corporate cash holdings in response to a 100% increase in domestic economic policy uncertainty.

Table 5. Economic policy uncertainty and corporate cash holdings

Variables	(1)	(2)	(3)	(4)	(5)
EPU	**0.0250*****	**0.0522*****	**0.0173*****	**0.0173*****	**0.0173*****
	(0.0000)	(0.0000)	(0.0000)	(0.000)	(0.0000)
MV		0.5155***	0.2121**	0.2121**	0.2121**
		(0.0000)	(0.0144)	(0.0144)	(0.0144)
MTBV		0.0671	-0.0686***	-0.0686***	-0.0686***
		(0.6606)	(0.0098)	(0.0098)	(0.0098)
LEV		0.0902*	0.1522	0.1522	0.1522
		(0.0681)	(0.2455)	(0.2455)	(0.2455)
CAPEX		-0.2512***	-0.1622***	-0.1622***	-0.1622***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
DIV		0.0568***	0.0130	0.0130	0.0130
		(0.0015)	(0.1308)	(0.1308)	(0.1308)
ΔSALE		0.011	0.0003	0.0003	0.0003
		(0.3901)	(0.9840)	(0.9840)	(0.9840)
NWC		0.4191***	0.6454***	0.6454***	0.6454***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
SIZE		-2.6248***	-1.2624***	-1.2624***	-1.2624***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
CF		0.3310***	0.2006	0.2006	0.2006
		(0.0000)	(0.2450)	(0.2450)	(0.2450)
CREDIT			0.0905**	0.0905**	0.0905**
			(0.0191)	(0.0191)	(0.0191)
MCAP			0.0291	0.0291	0.0291
			(0.1732)	(0.1732)	(0.1732)
TRADE			0.0102	0.0102	0.0102
			(0.7020)	(0.7020)	(0.7020)
GDPgrow			0.0080*	0.0080*	0.0080*
			(0.0838)	(0.0838)	(0.0838)
GDPcap			0.0228	0.0228	0.0228
			(0.4487)	(0.4487)	(0.4487)
FOREX			-0.0152	-0.0152	-0.0152
			(0.5218)	(0.5218)	(0.5218)
Constant	0.6357***	0.9547***	1.0327***	1.0327***	1.0327***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes
Country fixed effect	No	No	No	Yes	Yes
Industry fixed effect	No	No	No	No	Yes
Observations	117,468	35,007	17,208	17,208	17,208
Adjusted R-squared	0.0001	0.0673	0.0492	0.0492	0.0492

Note: This table reports the regression result of a country's economic policy uncertainty (EPU) and corporate cash holdings (cash-to-net asset ratio, CASH) in Column (1). The EPU index is lagged by one period to mitigate the endogeneity concern. We include firm-level controls such as market value (MV), market-to-book ratio (MTBV), leverage (LEV), capital expenditures (CAPEX), dividend payout (DIV), sales growth (ΔSALE), net working capital (NWC), firm size (SIZE) and cash flow (CF) in Column (2). In Column (3), we add six county-level controls such as domestic private credit (CREDIT), stock market capitalisation (MCAP), trade openness (TRADE), GDP growth rate (GDPgrow), GDP per capita (GDPcap) and foreign exchange rate (FOREX). In all regressions, we include firm-fixed effects and firm clustering effects. In Column (4), we add country-fixed effect while in Column (5), we add both country- and industry-fixed effects. All firm-level continuous variables are winsorized at 1% level. All variables are normalised by their standard deviation. Numbers reported in parentheses are robust standard errors. ***, ** and * denote significant levels of 1%, 5% and 10% respectively.

Next, we intend to investigate variations in corporate cash holdings decision in response to different types of uncertainty. To address this issue, we will analyse Model 2 by conducting a regression of corporate cash holdings with domestic economic policy uncertainty and US macroeconomic uncertainty. We test each h-period ahead of US macroeconomic uncertainty separately, along with the EPU, and the results of the regression are presented in Table 6. Similarly, all variables, including the USMUI and EPU variables, are normalised by their standard deviation for a clearer comparison of their economic impact. The results show that the coefficient of EPU is positive but insignificant. However, the USMUI for 1, 3 and 12 months ahead (h=1, 3 and 12) are consistently showing a positive relationship with corporate cash holdings with a coefficient of 0.0282, 0.0282 and 0.0289, respectively, and statistically significant at the 1% level. This result suggests that holding other variables constant, a hundred percentage increase in 1, 3 and 12 months ahead of US macroeconomic uncertainty would be associated with a 11.29% (0.0282*2.8152/0.7031), 11.29%, and 11.57% (0.0289*2.8152/0.7031) increase in corporate cash holdings, respectively. It is also noteworthy that the coefficient of USMUI increases with the forecast horizon. This shows that firms reserve more cash when forecasting the longer term of US macroeconomic variables become less certain. The results presented in Table 6 have two main implications. Firstly, in line with the notion that managers hold more cash when facing uncertainty, the positive relationship between US macroeconomic uncertainty and corporate cash reserves supports the precautionary motive outlined in the tradeoff theory of corporate cash holdings (Acharya & Pollock, 2013; Bliss et al., 2015), as well as the perspectives of risk aversion and the real-option effect highlighted in the uncertainty literature (Bloom, 2014; Panousi & Pananikolaou, 2012). Secondly, these findings indicate that domestic economic policy uncertainty becomes a less significant decisive factor influencing corporate cash holdings when the macroeconomic uncertainty originating from a leading economy, such as the United States, increases. This suggests that US macroeconomic uncertainty becomes a more critical factor affecting corporate cash decisions, taking into account the spillover effect of US uncertainty. This corroborates our argument that managers are more concerned with US real activities, price and market-based uncertainty over domestic economic policy uncertainty when determining their corporate cash holdings policy.

4.3 Robustness Checks

4.3.1 Alternative Measure of Corporate Cash Holdings

In an attempt to gain a better insight into the robust association between different types of uncertainty and corporate cash holdings, this study follows previous studies to consider cash-to-total asset ratio as an alternative proxy for corporate cash holdings (Demir & Ersan, 2017; Duong et al., 2020; Phan et al., 2019). The results of Column (1) presented in Table 7 are qualitatively in concordance with the results shown in Table 5, in which the results shows that domestic economic policy uncertainty (EPU) is statistically positively significantly related to cash-to-total assets of firms. However, it is surprising that the EPU in Column (2) and (3) is significant and the coefficient is larger

Table 6. Different types of uncertainty and corporate cash holdings

Variables	(1) EPU & USMUI (h=1)	(2) EPU & USMUI (h=1)	(3) EPU & USMUI (h=1)	(4) EPU & USMUI (h=3)	(5) EPU & USMUI (h=3)	(6) EPU & USMUI (h=3)	(7) EPU & USMUI (h=12)	(8) EPU & USMUI (h=12)	(9) EPU & USMUI (h=12)
EPU	0.0187	0.0191	0.0192	0.0187	0.0191	0.0192	0.0187	0.0191	0.0192
	(0.1246)	(0.1182)	(0.1151)	(0.1246)	(0.1182)	(0.1151)	(0.1246)	(0.1182)	(0.1151)
USMUI	**0.0282*****	**0.0282*****	**0.0289*****	**0.0282*****	**0.0282*****	**0.0289*****	**0.0282*****	**0.0282*****	**0.0289*****
	(0.0085)	(0.0083)	(0.0085)	(0.0085)	(0.0083)	(0.0085)	(0.0085)	(0.0083)	(0.0085)
MV	0.2106**	0.2105**	0.2107**	0.2106**	0.2105**	0.2107**	0.2106**	0.2105**	0.2107**
	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0149)
MTBV	-0.0686***	-0.0686***	-0.0687***	-0.0686***	-0.0686***	-0.0687***	-0.0686***	-0.0686***	-0.0687***
	(0.0095)	(0.0095)	(0.0094)	(0.0095)	(0.0095)	(0.0094)	(0.0095)	(0.0095)	(0.0094)
LEV	0.1483	0.1484	0.1484	0.1483	0.1484	0.1484	0.1483	0.1484	0.1484
	(0.2596)	(0.2592)	(0.2592)	(0.2596)	(0.2592)	(0.2592)	(0.2596)	(0.2592)	(0.2592)
CAPEX	-0.1618***	-0.1618***	-0.1619***	-0.1618***	-0.1618***	-0.1619***	-0.1618***	-0.1618***	-0.1619***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
DIV	0.0211**	0.0211**	0.0210**	0.0211**	0.0211**	0.0210**	0.0211**	0.0211**	0.0210**
	(0.0219)	(0.0219)	(0.0223)	(0.0219)	(0.0219)	(0.0223)	(0.0219)	(0.0219)	(0.0223)
ΔSALE	0.0005	0.0005	0.0006	0.0005	0.0005	0.0006	0.0005	0.0005	0.0006
	(0.9759)	(0.9746)	(0.9737)	(0.9759)	(0.9746)	(0.9737)	(0.9759)	(0.9746)	(0.9737)
NWC	0.6427***	0.6428***	0.6428***	0.6427***	0.6428***	0.6428***	0.6427***	0.6428***	0.6428***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SIZE	-1.2850***	-1.2849***	-1.2848***	-1.2850***	-1.2849***	-1.2848***	-1.2850***	-1.2849***	-1.2848***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
CF	0.2023	0.2023	0.2023	0.2023	0.2023	0.2023	0.2023	0.2023	0.2023
	(0.2402)	(0.2403)	(0.2403)	(0.2402)	(0.2403)	(0.2403)	(0.2402)	(0.2403)	(0.2403)

Table 6. Continued

Variables	(1) EPU & USMUI (h=1)	(2) EPU & USMUI (h=1)	(3) EPU & USMUI (h=1)	(4) EPU & USMUI (h=3)	(5) EPU & USMUI (h=3)	(6) EPU & USMUI (h=3)	(7) EPU & USMUI (h=12)	(8) EPU & USMUI (h=12)	(9) EPU & USMUI (h=12)
CREDIT	0.0556	0.0565	0.0577	0.0556	0.0565	0.0577	0.0556	0.0565	0.0577
	(0.2113)	(0.2017)	(0.1914)	(0.2113)	(0.2017)	(0.1914)	(0.2113)	(0.2017)	(0.1914)
MCAP	0.0251	0.0247	0.0245	0.0251	0.0247	0.0245	0.0251	0.0247	0.0245
	(0.2266)	(0.2341)	(0.2362)	(0.2266)	(0.2341)	(0.2362)	(0.2266)	(0.2341)	(0.2362)
TRADE	0.0046	0.0057	0.0070	0.0046	0.0057	0.0070	0.0046	0.0057	0.0070
	(0.8634)	(0.8314)	(0.7932)	(0.8634)	(0.8314)	(0.7932)	(0.8634)	(0.8314)	(0.7932)
GDPgrow	-0.0027	-0.0022	-0.0010	-0.0027	-0.0022	-0.0010	-0.0027	-0.0022	-0.0010
	(0.6378)	(0.6948)	(0.8523)	(0.6378)	(0.6948)	(0.8523)	(0.6378)	(0.6948)	(0.8523)
GDPcap	0.0373	0.0378	0.0388	0.0373	0.0378	0.0388	0.0373	0.0378	0.0388
	(0.2230)	(0.2171)	(0.2048)	(0.2230)	(0.2171)	(0.2048)	(0.2230)	(0.2171)	(0.2048)
FOREX	-0.0027	-0.0022	-0.0025	-0.0027	-0.0022	-0.0025	-0.0027	-0.0022	-0.0025
	(0.9119)	(0.9282)	(0.9181)	(0.9119)	(0.9282)	(0.9181)	(0.9119)	(0.9282)	(0.9181)
Constant	1.0072***	1.0076***	1.0100***	1.0072***	1.0076***	1.0100***	1.0072***	1.0076***	1.0100***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry fixed effect	No	No	Yes	No	No	Yes	No	No	Yes
Observations	17,208	17,208	17,208	17,208	17,208	17,208	17,208	17,208	17,208
Adjusted R-squared	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499	0.0499

Note: This table reports the evidence on the relationship between two different types of uncertainty (EPU and USMUI) and corporate cash holdings (cash-to-net asset ratio, CASH) in the sample of 17 countries, excluding the United States. EPU is the domestic economic policy uncertainty index developed by Baker et al. (2016). The US macroeconomic uncertainty index is developed by Jurado et al. (2015) for 1, 3 and 12 months ahead (h=1, 3 and 12). Both types of uncertainty indexes are lagged by one period to mitigate the endogeneity concern. In all regressions, we include firm-fixed effects and firm clustering effects. All variables are normalised by their standard deviation. In Columns (2), (5) and (8), we add country-fixed effect while in Columns (3), (6) and (9), we add both country- and industry-fixed effects. Numbers reported in parentheses are robust standard errors. ***, ** and * denote significant levels of 1%, 5% and 10% respectively.

Table 7. Alternative measure of corporate cash holdings

Variables	(1) EPU only	(2) EPU & USMUI (*h=1*)	(3) EPU & USMUI (*h=3*)	(4) EPU & USMUI (*h=12*)
EPU	**0.0080*****	**0.0057*****	**0.0058*****	**0.0057*****
	(0.0000)	(0.0001)	(0.0001)	(0.0001)
USMUI		**0.0054*****	**0.0054*****	**0.0058*****
		(0.0000)	(0.0000)	(0.0000)
MV	0.0539***	0.0535***	0.0535***	0.0535***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
MTBV	-0.0111**	-0.0111**	-0.0111**	-0.0111**
	(0.0216)	(0.0203)	(0.0202)	(0.0200)
LEV	0.0102	0.0094	0.0095	0.0094
	(0.2671)	(0.3019)	(0.3009)	(0.3027)
CAPEX	-0.0136***	-0.0135***	-0.0135***	-0.0135***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
DIV	0.0026	0.0041**	0.0041**	0.0042**
	(0.1858)	(0.0343)	(0.0346)	(0.0326)
ΔSALE	0.0024*	0.0025*	0.0025*	0.0025*
	(0.0632)	(0.0586)	(0.0581)	(0.0576)
NWC	0.0750***	0.0746***	0.0746***	0.0746***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SIZE	-0.1363***	-0.1406***	-0.1406***	-0.1407***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
CF	-0.0251**	-0.0247**	-0.0247**	-0.0247**
	(0.0306)	(0.0326)	(0.0326)	(0.0326)
CREDIT	0.0247***	0.0180***	0.0181***	0.0181***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
MCAP	0.0021	0.0014	0.0013	0.0012
	(0.2987)	(0.5043)	(0.5334)	(0.5525)
TRADE	0.0074*	0.0063	0.0066*	0.0068*
	(0.0623)	(0.1107)	(0.0994)	(0.0884)
GDPgrow	0.0025***	0.0004	0.0005	0.0007
	(0.0000)	(0.5484)	(0.4582)	(0.3201)
GDPcap	-0.0042	-0.0014	-0.0013	-0.001
	(0.2028)	(0.6857)	(0.7057)	(0.7762)
FOREX	0.0119***	0.0143***	0.0144***	0.0144***
	(0.0067)	(0.0020)	(0.0019)	(0.0019)
Constant	0.2162***	0.2113***	0.2114***	0.2117***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observations	17,208	17,208	17,208	17,208
Adjusted R-squared	0.0492	0.0499	0.0499	0.0499

Note: This table reports the regression results of the relationship between different types of uncertainty and the alternative measure of corporate cash holdings, cash-to-total asset ratio. EPU is the domestic policy uncertainty while USMUI is the US macroeconomic uncertainty. All variables are normalised by their standard deviation. Column (1) includes EPU only, while Columns (2), (3) and (4) include EPU and USMUI with 1, 3, and 12-months ahead (h=1, 3 and 12), respectively. In all regressions, we include firm-, country- and industry-fixed effects. Numbers reported in parentheses are robust standard errors. ***, ** and * denote significant levels of 1%, 5% and 10% respectively.

than the coefficient of the 1 and 3 months ahead (h=1 and 3) of US macroeconomic uncertainty. Nevertheless, consistent with Table 6, the coefficient of 12 months ahead (h=12) of US macroeconomic uncertainty is found to be statistically positively significantly related to cash-to-total assets of firms, and the coefficient is larger than the coefficient of EPU. These results suggest that domestic EPU significantly influences corporate cash holdings, and that US macroeconomic uncertainty (USMUI) has a greater impact on domestic EPU in shaping corporate cash holding policy.

4.3.2 Alternative Types of US Macroeconomic Uncertainty

To further verify the robustness of our findings in Table 5 and 6, we reanalyse Model 2 using alternative types of US macroeconomic uncertainty developed by Jurado et al. (2015). Specifically, we replaced the US macroeconomic uncertainty in Model 2 with US financial uncertainty (USFUI) and US real uncertainty (USRUI) to gauge the potential impacts of financial market and real activities uncertainty on corporate cash holdings. The results are presented in Table 8, indicating that the coefficients of USFUI and USRUI remain both statistically significant and positively correlated in determining the level of cash reserves. Furthermore, the domestic EPU is insignificant when tested alongside with USFUI and USRUI, suggesting that U.S. financial uncertainty and real uncertainty are more important factors than domestic EPU when firm managers are deciding their corporate cash policy.

Overall, our robustness tests further strengthen our findings that the US macroeconomic uncertainty outweighs domestic economic policy uncertainty in influencing corporate cash holdings.

Table 8. Alternative types of US macroeconomic uncertainty

	EPU & US financial uncertainty			EPU & US real uncertainty		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	EPU & USFUI (*h=1*)	EPU & USFUI (*h=3*)	EPU & USFUI (*h=12*)	EPU & USRUI (*h=1*)	EPU & USRUI (*h=3*)	EPU & USRUI (*h=12*)
EPU	0.0176	0.0177	0.0183	0.0152	0.0152	0.0155
	(0.1593)	(0.1547)	(0.1384)	(0.2179)	(0.2175)	(0.2132)
USFUI	**0.0227***	**0.0228***	**0.0225***			
	(0.0614)	(0.0620)	(0.0675)			
USRUI				**0.0317****	**0.0320****	**0.0334****
				(0.0115)	(0.0107)	(0.0113)
MV	0.2136**	0.2138**	0.2141**	0.2106**	0.2106**	0.2111**
	(0.0134)	(0.0133)	(0.0131)	(0.0148)	(0.0148)	(0.0146)
MTBV	-0.0681**	-0.0681**	-0.0682**	-0.0691***	-0.0693***	-0.0697***
	(0.0102)	(0.0102)	(0.0101)	(0.0089)	(0.0088)	(0.0085)
LEV	0.1500	0.1500	0.1499	0.1473	0.1473	0.1472
	(0.2547)	(0.2548)	(0.2550)	(0.2627)	(0.2627)	(0.2628)
CAPEX	-0.1620***	-0.1620***	-0.1620***	-0.1611***	-0.1610***	-0.1609***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Table 8. Continued

	EPU & US financial uncertainty			EPU & US real uncertainty		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	EPU & USFUI (*h=1*)	EPU & USFUI (*h=3*)	EPU & USFUI (*h=12*)	EPU & USRUI (*h=1*)	EPU & USRUI (*h=3*)	EPU & USRUI (*h=12*)
DIV	0.0183**	0.0184**	0.0184**	0.0208**	0.0209**	0.0208**
	(0.0484)	(0.0481)	(0.0483)	(0.0219)	(0.0214)	(0.0219)
ΔSALE	0.0009	0.0008	0.0007	0.0004	0.0005	0.0004
	(0.9602)	(0.9618)	(0.9656)	(0.9803)	(0.9786)	(0.9793)
NWC	0.6432***	0.6432***	0.6432***	0.6419***	0.6419***	0.6420***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SIZE	-1.2777***	-1.2781***	-1.2786***	-1.2902***	-1.2912***	-1.2933***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
CF	0.2023	0.2024	0.2024	0.2035	0.2036	0.204
	(0.2404)	(0.2403)	(0.2401)	(0.2373)	(0.2370)	(0.2361)
CREDIT	0.0694	0.069	0.0686	0.0474	0.0474	0.0474
	(0.1032)	(0.1070)	(0.1127)	(0.3092)	(0.3078)	(0.3090)
MCAP	0.0293	0.0295	0.0298	0.0287	0.0283	0.0281
	(0.1716)	(0.1703)	(0.1679)	(0.1796)	(0.1852)	(0.1887)
TRADE	0.0072	0.0063	0.0046	-0.0065	-0.006	-0.0067
	(0.7867)	(0.8123)	(0.8644)	(0.8131)	(0.8261)	(0.8070)
GDPgrow	0.0061	0.006	0.006	-0.0057	-0.0056	-0.0048
	(0.1996)	(0.2044)	(0.2067)	(0.3847)	(0.3914)	(0.4470)
GDPcap	0.0361	0.0357	0.0349	0.0308	0.031	0.0307
	(0.2457)	(0.2497)	(0.2595)	(0.3121)	(0.3086)	(0.3133)
FOREX	0.0037	0.0030	0.0016	-0.0153	-0.016	-0.0198
	(0.8753)	(0.8999)	(0.9463)	(0.5206)	(0.4986)	(0.3994)
Constant	1.0149***	1.0155***	1.0169***	1.0117***	1.0125***	1.0173***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,208	17,208	17,208	17,208	17,208	17,208
Adjusted R-squared	0.0495	0.0495	0.0495	0.0500	0.0500	0.0500

Note: This table reports the regression results of the relationship between domestic economic policy uncertainty, alternative types of uncertainty stemming from the US, and corporate cash holdings. EPU is the domestic policy uncertainty, USFUI is the US financial uncertainty, and USRUI is the US real uncertainty. Columns (1), (2) and (3) include EPU and USFUI with 1, 3 and 12-months ahead (h=1, 3 and 12), respectively. Columns (4), (5) and (6) include EPU and USRUI with 1, 3 and 12-months ahead (h=1, 3 and 12), respectively. All variables are normalised by their standard deviations. In all regressions, we include firm-, country- and industry-fixed effects. Numbers reported in parentheses are robust standard errors. ***, ** and * denote significant levels of 1%, 5% and 10% respectively.

4.4 Additional Analysis of Different Types of Uncertainty and Corporate Cash Holdings: Developed versus Emerging Countries

Given the potential influence of domestic economic policy uncertainty and the possibilities for uncertainty in the US to impact other countries (Castelnuovo & Pellegrino, 2017), it is important to explore how domestic economic policy uncertainty and macroeconomic uncertainty in the US influences the cash management decisions of firms in developed and emerging economies. This understanding can help managers in these countries anticipate the impact of domestic uncertainty and US uncertainty on corporate cash holdings and proactively shape their cash management policies. Thus, we segregate our sample countries into two sub-samples, which are the developed and emerging countries, based on the classification provided by the International Monetary Fund (IMF).[5] We then rerun the regression analysis on Models 1 and 2 on each sub-sample. The regression results are provided in Table 9. Columns (1) to (4) document that the coefficient of the domestic EPU and US macroeconomic uncertainty (USMUI) is positively and statistically significant at 1% level, however, the coefficient of EPU is greater than USMUI. This suggests that corporate cash holdings in developed countries are greatly influenced by domestic economic policy uncertainty. Nonetheless, the coefficients of EPU and USMUI are insignificant in Columns (5) to (8). These findings generally suggest that the impact of domestic economic policy uncertainty and US macroeconomic uncertainty on corporate cash holdings is more pronounced in developed countries.

5. Conclusion

In conclusion, we provide significant insights into the relationship between different types of uncertainties and corporate cash holdings across 18 countries from 2003–2023. Our study enriches the understanding of how firms navigate financial strategies in uncertain environment. Our findings affirm that domestic economic policy uncertainty leads firms to increase their cash reserves as a precautionary measure, consistent with the tradeoff theory. Moreover, we introduce a novel comparison between domestic economic policy uncertainty and US macroeconomic uncertainty, revealing that the latter has a more substantial impact on corporate cash holding behaviour globally. Our results are robust and consistent when we utilise alternative measures of corporate cash holdings and US macroeconomic uncertainty. Our additional analysis further shows that the relationship between domestic economic policy uncertainty, US macroeconomic uncertainty, and corporate cash holdings is more pronounced for firms in developed countries compared to firms in emerging countries.

Given the significant roles of both domestic economic policy uncertainty and US macroeconomic uncertainty in shaping corporate financial decisions, our findings underscore the importance for policymakers and corporate managers to consider not only local economic conditions but also the broader global economic environment,

[5] Based on the IMF classification, Australia, Canada, France, Germany, Greece, Ireland, Italy, Japan, Singapore, South Korea, Spain, United Kingdom and the United States are grouped under the subsample of developed countries, whereas Brazil, Chile, China, India, and Russia are grouped under the subsample of emerging countries.

Table 9. Different types of uncertainty and corporate cash holdings: Developed versus emerging countries

	Developed countries				Emerging countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	EPU only	EPU & USMUI (*h=1*)	EPU & USMUI (*h=3*)	EPU & USMUI (*h=12*)	EPU only	EPU & USMUI (*h=1*)	EPU & USMUI (*h=3*)	EPU & USMUI (*h=12*)
EPU	**0.0516*****	**0.0358****	**0.0364****	**0.0368****	0.0053	0.0025	0.0025	0.0023
	(0.0013)	(0.0335)	(0.0315)	(0.0298)	(0.2403)	(0.6486)	(0.6522)	(0.6802)
USMUI		**0.0333****	**0.0333****	**0.0340****		0.0040	0.0041	0.0045
		(0.0108)	(0.0107)	(0.0110)		(0.1853)	(0.1754)	(0.1538)
MV	0.2386***	0.2434**	0.2433**	0.2432**	0.0154	0.0151	0.015	0.0149
	(0.0000)	(0.0116)	(0.0116)	(0.0117)	(0.3843)	(0.5746)	(0.5775)	(0.5814)
MTBV	-0.1428	-0.1388	-0.1390	-0.1402	-0.0022	-0.0018	-0.0018	-0.0018
	(0.1444)	(0.2605)	(0.2595)	(0.2551)	(0.6607)	(0.8365)	(0.8366)	(0.8391)
LEV	0.1967***	0.1887	0.1889	0.1889	-0.0199**	-0.0196	-0.0196	-0.0196
	(0.0000)	(0.2249)	(0.2244)	(0.2243)	(0.0373)	(0.3151)	(0.3153)	(0.3150)
CAPEX	-0.1849***	-0.1842***	-0.1842***	-0.1842***	-0.0104**	-0.0104	-0.0104	-0.0104
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0452)	(0.1498)	(0.1499)	(0.1495)
DIV	0.0271	0.0315**	0.0314**	0.0314**	0.0039	0.0054	0.0055	0.0056
	(0.2162)	(0.0211)	(0.0211)	(0.0211)	(0.2619)	(0.3338)	(0.3284)	(0.3184)
ΔSALE	0.0019	0.002	0.0021	0.0022	-0.0006	-0.0007	-0.0007	-0.0007
	(0.8610)	(0.9267)	(0.9243)	(0.9220)	(0.8143)	(0.8363)	(0.8353)	(0.8351)
NWC	0.8117***	0.8058***	0.8059***	0.8060***	0.0687***	0.0682*	0.0682*	0.0682*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0759)	(0.0758)	(0.0757)
SIZE	-1.5074***	-1.5349***	-1.5348***	-1.5349***	-0.0857***	-0.0865	-0.0866	-0.0866
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0009)	(0.1963)	(0.1962)	(0.1958)
CF	0.1829***	0.1865	0.1865	0.1865	0.1044***	0.1015***	0.1015***	0.1013***
	(0.0000)	(0.3025)	(0.3027)	(0.3026)	(0.0000)	(0.0011)	(0.0011)	(0.0011)
CREDIT	0.0950***	0.0494	0.0509	0.0525	0.0096	0.0101	0.0102	0.0103
	(0.0029)	(0.3430)	(0.3259)	(0.3080)	(0.5247)	(0.6798)	(0.6771)	(0.6729)

Table 9. Continued

	Developed countries				Emerging countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	EPU only	EPU & USMUI (*h=1*)	EPU & USMUI (*h=3*)	EPU & USMUI (*h=12*)	EPU only	EPU & USMUI (*h=1*)	EPU & USMUI (*h=3*)	EPU & USMUI (*h=12*)
MCAP	0.0929**	0.0841	0.0828	0.0833	0.0055	0.004	0.004	0.0039
	(0.0217)	(0.1703)	(0.1753)	(0.1736)	(0.1527)	(0.3558)	(0.3595)	(0.3681)
TRADE	0.0071	0.0009	0.0022	0.0035	0.0521	0.0461	0.0468	0.0484
	(0.8683)	(0.9806)	(0.9521)	(0.9245)	(0.1205)	(0.2317)	(0.2252)	(0.2116)
GDPgrow	0.0061	-0.0073	-0.0067	-0.0052	0.0012	0.0007	0.0007	0.0007
	(0.5477)	(0.3168)	(0.3489)	(0.4458)	(0.6713)	(0.8054)	(0.8021)	(0.7867)
GDPcap	0.0700	0.0702	0.0709	0.0732	0.0110*	0.0119	0.0121	0.0125
	(0.1385)	(0.3481)	(0.3432)	(0.3285)	(0.0638)	(0.2548)	(0.2497)	(0.2371)
FOREX	-0.023	-0.015	-0.0139	-0.014	0.0363***	0.0392**	0.0393**	0.0396**
	(0.6031)	(0.6840)	(0.7064)	(0.7047)	(0.0004)	(0.0293)	(0.0291)	(0.0286)
Constant	1.2104***	1.1665***	1.1657***	1.1687***	0.2102***	0.2155**	0.2163**	0.2183***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0104)	(0.0101)	(0.0096)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,331	14,331	14,331	14,331	2,877	2,877	2,877	2,877
Adjusted R-squared	-0.1068	0.0588	0.0588	0.0588	0.0418	0.0500	0.0500	0.0501

Note: This table reports the sub-sample regression results to compare the influence of different types of uncertainty on corporate cash holdings in both developed and emerging countries. The sample of 17 countries (excluding the United States) are grouped into developed and emerging countries based on the classification provided by the International Monetary Fund (IMF). EPU is the domestic policy uncertainty while USMUI is the US macroeconomic uncertainty. Columns (1) to (4) report the sub-sample regression results of developed countries. Column (1) includes EPU only, while Columns (2), (3) and (4) include EPU and USMUI with 1, 3 and 12-months ahead (h=1, 3 and 12), respectively. Columns (5) to (8) report the sub-sample regression results of emerging countries. Column (5) includes EPU only, while Columns (6), (7) and (8) include EPU and USMUI with 1, 3 and 12-months ahead (h=1, 3 and 12), respectively. All variables are normalised by their standard deviation. In all regressions, we include firm-, country- and industry-fixed effects. Numbers reported in parentheses are robust standard errors. ***, ** and * denote significant levels of 1%, 5%, and 10% respectively.

particularly the influence of macroeconomic factors originating from major economies like the United States. Our study suggests that firms are more responsive to the US's macroeconomic uncertainty than to domestic policy uncertainty alone which highlights the global influence of US economic stability. For policymakers in other countries, these insights underscore the necessity of preparing for potential spillover effects from global economic shifts, particularly those originating from the US. Our study suggests that future research could further explore the dynamic interplay between local and global macroeconomic uncertainties and their broader implications on corporate financial policies. Understanding these nuances could help in formulating more targeted corporate financial policies that effectively mitigate the risks associated with both domestic and international economic uncertainty.

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