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Corporate Cash Holding, Agency Problems and Economic Policy Uncertainty

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Abstract

Consistent with the agency view of cash holdings, we document a strong negative relationship between economic policy uncertainty and corporate cash holdings for non-U.S. firms from 19 countries. Our results are robust to different measures of cash holdings and model specifications and survive after addressing endogeneity. We provide evidence that the decrease in cash holdings is moderated by shareholders' ability to force managers to disgorge cash that fits consistently within the agency framework. Overall, results suggest that lowering cash holdings help alleviate agency problems in the presence of policy uncertainty and underscore the significance of country attributes in corporate finance.

JEL Classification: G15; G32; G35; G38

Keywords: Policy uncertainty; Corporate Cash holding; Dividend payout; Agency problems

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1. Introduction

Economic Policy Uncertainty (EPU) has a profound and far-reaching adverse effect on the economy (Stock and Watson 2012; Julio and Yook 2012; Baker et al. 2016) and how it affects different corporate policies is an important question that has increasingly attracted researchers' interest. Among these policies, corporate cash holdings has received a growing academic attention in the literature (Opler et al.1999; Harford 1999; Dittmar et al. 2003; Pinkowitz et al. 2006; Dittmar and Mahrt-Smith 2007; Foley et al.2007; Harford et al. 2008; Bates et al. 2009; Duchin 2010; Nikolov and Whited 2014; Gao et al. 2013). Understanding the effect of policy uncertainty on cash holdings is important, because cash holdings can act not only as a safety net in the presence of costly external financing but also may impact investors' concerns about managerial self-dealing, and both are likely to increase with policy uncertainty. In addition, cash holdings may affect other aspects of firms such as refinancing risk (Harford et al. 2014) and innovation (Lyandres and Palazzo 2016).

Prior studies on the effect of policy uncertainty on corporate policies are mainly focused on U.S. firms. For example, they find U.S. corporate investment and mergers and acquisitions are negatively related to policy uncertainty (Gule and Ion 2016; Nguyen and Phan 2017; Bonaime et al. 2018) whereas cost of borrowing (Kaviani et al. 2019) and cash holdings (Phan et al. 2019; Duong et al. 2020) are positively affected. While this growing literature has improved our understanding of the relation between policy uncertainty and corporate policies in the U.S., the international evidence is scant and there remains a paucity of research focused on non-US firms. We contribute to this debate by studying the effect of policy uncertainty on corporate cash holdings in an international setting.

There are two broad theories for explaining corporate cash holdings: the precautionary motive and the agency problems. These two theories make opposite predictions on the impact of policy uncertainty on cash holdings. Policy uncertainty can exacerbate information asymmetry, financing friction, and increase cost of external capital (Kaviani et al. 2019; Ashraf and Shen 2019). According to the precautionary motive framework, firms hold cash to avoid raising funds when external capital is expensive (Acharya et al. 2007; Almeida et al. 2004). Therefore, precautionary motive for holding cash predicts that corporate cash holdings in non-U.S. firms, as in U.S. firms, should increase in the face of policy uncertainty to safeguard investments against financing shocks, indicating a positive link between policy uncertainty and cash holdings.

By contrast, the agency problems framework predicts a negative association between policy uncertainty and corporate cash holdings. According to the agency view, management may not use the cash in the best interests of the firm. Managers may overinvest the cash in value destroying acquisitions (Harford 1999; Harford et al. 2008), or they can easily use the cash to extract private benefits (Myers and Rajan 1998). As pointed out by Attig et al. (2021), this problem is likely to be exacerbated during periods of high policy uncertainty since increased EPU is associated with declining macroeconomic activities (Baker et al. 2016) and corporate capital investment (Gulen and Ion 2016), which in turn will increase firms' cash holdings that can be expropriated by managers. In fact, using a sample of non-U.S. firms from 19 countries, Attig et al. (2021) find a robust positive association between policy uncertainty and firms' dividend payout. Their result is consistent with the agency problems framework and implies a negative link between EPU and corporate cash holdings. Put differently, 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 since it forces them to go to capital markets to fund future investments and will subject them to higher external scrutiny

by the market and thereby mitigating agency problems of free cash flow (Easterbrook 1984; Rozeff 1982; Jensen 1986).

The primary reason for using international data for our analysis is that firms outside the U.S., particularly those in developing and emerging economies, significantly differ from U.S. firms along several important dimensions. These firms face a different set of agency problems due to their legal origins, ownership concentration structures, inefficient judicial and legal systems and law enforcements, low quality of accounting standards, pervasively weak financial systems, corruption, and the harmful culture of political patronage (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, LLSV here after, 1998, 1999, and 2000; Claessens et al. 2000; Faccio and Lang 2002; Stulz 2005; Facci et al. 2006; Ayyagari et al. 2010a and 2010b; Murphy et al. 1993).[1] This differing set of agency problems could lead to dynamics completely different from those of the U.S. and have direct implications for our cross-country examination of the relationship between policy uncertainty and corporate cash holding.

We examine the cross-country relationship between policy uncertainty and corporate cash holdings using the index developed by Baker et al. (2016). This is a news based measure and is widely used in finance and economics research (Gulen and Ion 2016; Nguyen and Phan 2017; Bonaime et al. 2018; Phanet al. 2019; Duong et al. 2020; Attig et al. 2021 just to name a few).[2] Using a sample of 140,429 firm-year observations of 14,616 unique firms from 19 countries between 1991 and 2016, we provide evidence consistent with the prediction of the agency problems framework. In sharp contrast to prior findings based on the U.S. data, we find a strong

[1]Ayyagari, Demirguc-Kunt, and Maksimovic (2013) outline nine distinctive features of firms in developing economies that set them apart from those in developed economies. Those features include Concentrated Ownership and Separation of Cash Flow and Voting Rights; Capital Structure Choices; Banks versus Markets; Access to Foreign Capital; Cross-Border Mergers; Productivity; Industry Structure and Entrepreneurship; Role of Small Firms; Informality.

[2] We describe this measure in detail in Section 3.1.

and robust negative relationship between economic policy uncertainty and cash holdings that is statistically and economically significant. With a representative specification, a one standard deviation increase in policy uncertainty is associated with about a 0.5% decrease in cash and marketable securities scaled by total asset. Compared to the unconditional mean cash holdings (16.2%), this is approximately a 3% drop in the level of cash balance. Consistent with the agency view, our main finding suggests that reducing cash holdings alleviates agency costs of free cash flow during increased EPU periods that are associated with declining investment opportunity set (Gulen and Ion 2016) and aggravate agency problems. Our result holds after controlling for the confounding effect of the U.S. policy uncertainty and other macroeconomic factors that may affect the policy uncertainty index; and is also robust to different model specifications and alternative measures of cash holdings.

Our agency framework suggests that reducing cash when facing policy uncertainty, presumably as an effort to mitigate managerial agency problems, should be valued by outside shareholders. We find empirical evidence supporting this prediction. Following Kalcheva and Lins (2007), we find that policy uncertainty has an adverse impact on firm value. More importantly, we document that reducing cash holdings amid policy uncertainty has a significantly positive marginal value, mitigating the adverse effect of EPU. Similarly, we find that paying out more dividends during high-EPU periods has a positive marginal value. These results support our agency framework in which the ability to disgorge cash prevents its diversion, which ameliorates managerial agency problems and benefits outside shareholders, especially during high-EPU periods when investment opportunities are poor (LLSV 2000; Attig et al 2021).

Further, shareholders' ability to force managers to disgorge cash varies substantially across countries and depends critically on a country's legal environment. Agency view of cash holdings

predicts that shareholders in countries with poor shareholder protection cannot force managers to disgorge cash. Thus, according to this view, firms in countries with poor investor protection are expected to hold more cash than those in countries with strong legal protection of shareholders. Results of cross-country studies support this prediction. Dittmar et al. (2003) show that firms in countries with poor investor protection hold about twice as much cash as those in countries with strong shareholder protection. LLSV (2000) find that shareholders of firms in common law countries, use their legal power and force managers to disgorge cash from firms. Pinkowitz et al. (2006) find that investors place a lower value on a dollar of corporate cash holdings in countries with poor governance compared to a dollar of cash holdings in countries with good governance. Therefore, our agency problems framework implies that the reduction in cash holdings amid policy uncertainty should be more pronounced in countries with stronger governance and legal protection of external shareholders. We provide empirical evidence consistent with these predictions. Specifically, we show that the reduction in cash holdings is stronger among firms in common law countries that provide the best legal protection to external shareholders and less pronounced in emerging economies and in countries that are characterize as more corrupt or in those with comparatively poor governance.

Our analysis is likely to suffer from endogeneity problem since corporate cash holdings and policy uncertainty can be jointly correlated with unobservable variables. Therefore, following the recent EPU studies (e.g., Attig et al 2021), we use political polarization to instrument policy uncertainty, and implement a two-stage IV regression model. In another attempt to address endogeneity, we also use a simultaneous equation framework to take into account that the response in corporate cash holdings, dividend, financing and investment policies to policy uncertainty are likely determined simultaneously. In both analyses, the effect remains significantly negative.

Our results do not imply that the precautionary motive for holding cash is irrelevant to our sample firms. Results simply reflect the fact that cash is viewed and used differently outside the US. Lines of credit are the dominant form of liquidity and funding for investment opportunities outside the U.S. (Lins, Servaes, and Tufano 2010). Thus, in the presence of policy uncertainty, precautionary motive is more likely to be manifested in lines of credit rather than cash that has a higher propensity to be expropriated. Thus, policy uncertainty may elicit different reactions in cash and lines of credit: cash holdings decrease to mitigate managerial agency problems, while lines of credit (or the probability of having one) increase due to precautionary motives. Our analysis of firms' lines of credit confirms this prediction.

Our study contributes to the literature on several fronts. We add to the growing literature that investigates the impact of policy uncertainty on different corporate policies. To the best of our knowledge, this is the first large-scale cross-country study that examines the relationship between policy uncertainty and cash holdings. Studies by Duong et al. (2020) and Phan et al. (2019) use U.S. data and document a positive relationship between policy uncertainty and cash holdings. While the research question is similar, our samples are entirely different. The substantial variation in legal environment across countries, allows us to run a horserace between the precautionary motive and the agency problems frameworks, which cannot be done on the data from only the U.S. Furthermore, the sharp contrast between our results and theirs highlights the significance and the crucial role that countries' legal environment play in corporate finance and adds to the evidence in LLSV (2000); Dittmar et al. (2003); Pinkowitz et al. (2006); and Kalcheva and Lins 2007; on the importance of external country-level governance.

The closest study to ours is the paper by Demir and Ersan (2017). They study the impact of policy uncertainty on a relatively small sample of non-U.S. firms from BRIC countries (Brazil,

Russia, India, China) between 2006 and 2015. They report a positive relationship between policy uncertainty and cash. Our study is different from theirs in two important ways. First, they focus on only four countries over a 10-year period, whereas our sample is from 19 countries, over a much longer period that encompasses theirs. Second and more importantly, they only include year and industry fixed effects in their model specification, which fails to control for time invariant country or firm characteristics. According to Imbens and Wooldridge (2009), the inclusion of country, year, and industry fixed effects is necessary to assure that the EPU estimate is reflecting within-country changes in EPU and not just cross-sectional correlation. In contrast, throughout our study, we use both firm and time fixed effects. Khan et al. (2016) argue that the inclusion of both firm and time fixed effects resembles a generalized difference-in-differences approach and improves the causal interpretation. We show that the results in Demir and Ersan (2017) are sensitive to the fixed effects included in their model. Specifically, when we restrict our sample to BRIC countries during their sample period (2006-2015) and use their model specification with industry and time fixed effects, we obtain a significantly positive coefficient on EPU that is comparable to theirs. However, if we use firm and time fixed effects, the sign of the EPU coefficient flips and becomes significantly negative. Overall, our results combined with those of Attig et al. (2021) provide compelling evidence that non-U.S. firms' response to policy uncertainty is mainly aimed at ameliorating the agency problems, in part, by paying out their cash holdings to their shareholders.

The remainder of this article proceeds as follows. Section 2 focuses on the literature review and hypothesis development. Section 3 describes the data and policy uncertainty measure. In Section 4, we introduce our empirical design and discuss the main findings of the paper and conduct some robustness test. Section 5 explores where the cash is going. We address endogeneity

in Section 6, and conduct a series of subsample analyses in Section 7. Lines of credit are examined in Section 8 and we conclude in Section 9.

2. Literature Review and Hypothesis Development

Our study is related to three lines of research: the voluminous cash holdings literature, a new and growing literature that investigates the impact of policy uncertainty on different corporate policies, as well as the literature that examines the role of countries and external country-level governance in corporate finance. Given the sheer size of the related literatures, we only review papers directly related to ours.

2.1. Related Research on Policy Uncertainty

A relatively new but fast-growing literature has been studying the effect of economic policy uncertainty on corporations. Baker et al. (2016) develop an index that quantifies government-induced policy uncertainty and show that policy uncertainty has a profound and far-reaching adverse impact on the economy. Their economic policy uncertainty measure has been used in several studies (Brogaard and Detzel 2015; Gulen and Ion 2016; Nguyen and Phan 2017; Bonaime et al. 2018; Phan et al. 2019; Kaviani et al. 2019; Duong et al. 2020; Attig et al 2021 etc.) that focus on the asset pricing implications of policy uncertainty as well as its effects on different firms' policies such as capital investment, mergers and acquisitions, and cash holdings. For instance, studies by Gilchrist et al. (2014) and Pastor and Veronesi (2013) show that policy uncertainty commands a risk premium, increases cost of capital, and aggravates financial constraints. Brogaard and Detzel (2015) find that policy uncertainty positively forecasts log excess market returns and commands a negative risk premium in the cross-section. In a recent paper, Kaviani et al. (2019) document a positive link between economic policy uncertainty and cost of borrowing. They find

that policy uncertainty increases corporate credit spreads. In another recent study, Ashraf and Shen (2019) report a positive association between cost of bank loans and EPU.

Another branch of this literature investigates how policy uncertainty affects different corporate policies. Using the EPU index, Gulen and Ion (2016) study the impact of economic policy uncertainty on corporate investments and show that there is a strong negative relationship between them, particularly for irreversible investments and for firms that are more reliant on government spending. Similarly, Nguyen and Phan (2017) and Bonaime et al. (2018) focus on firms' mergers and acquisitions and document a significant negative link between policy uncertainty and firms' merger and acquisition activities. The results of these studies suggest a significant delay in corporate investments amid policy uncertainty that, as pointed out by Floyd et al. (2015), should lead to higher cash holding, providing indirect evidence that corporate cash holdings and policy uncertainty are positively associated. Phan et al. (2019) and Duong et al. (2020) show when policy uncertainty rises, U.S. firms respond by increasing their cash holdings due to precautionary motives, documenting a direct positive link between policy uncertainty and cash holding.

2.2. Hypothesis development

Cash holdings literature has predominantly offered two frameworks to explain corporate cash holdings and its dynamic: precautionary motive and agency problems. Opler et al. (1999) provide empirical support for a precautionary motive framework which contends that financing friction, defined as the wedge between internal and external cost of capital, creates precautionary motives for firms to hold cash. Facing costly external financing, firms hold cash as a buffer against negative shocks to their cash flows that might preclude them from undertaking positive net present value projects. Other papers have also found support for the precautionary motive framework, particularly for firms that suffer more from information asymmetry. Evidence in Bates et al. (2009)

explaining the increasing trend in cash holdings of U.S. firm is consistent with the precautionary motive but not the agency framework. Consistent with precautionary motive, Duchin (2010) finds that smaller firms' "financing gaps" (Acharya et al. 2007) are associated with lower cash holdings.

In short, precautionary motive framework posits that firms hold cash to avoid raising funds when external capital is expensive (Acharya et al. 2007; Almeida et al. 2004). Thus, to the extent that policy uncertainty hinders investment opportunities, delays corporate investments, exacerbates information asymmetry and financing friction, and increases cost of external capital, precautionary motive framework suggests that corporate cash holdings should increase. Several studies (e.g., Phan et al. 2019 and Duong et al. 2020) document a positive link between policy uncertainty and corporate cash holdings in U.S. firms. This framework is relevant to our study, since (compared to U.S. firms) non-U.S. firms, especially those in emerging economies, generally suffer more from information asymmetry and financing friction. This leads to our first hypothesis:

Precautionary Motive Hypothesis: Policy uncertainty is positively related to corporate cash holdings.

In contrast, 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. Moreover, they rely on cash and liquid assets to finance their empire building and self-dealing. This view suggests when shareholders have more power, they force management to disgorge cash. In cross-country analyses, this framework predicts that firms in countries with poor investor protection should hold more cash. Consistent with this prediction, Dittmar et al. (2003) and Kalcheva and Lins (2007) find evidence that firms hold more cash when country-level shareholder protection is weak. Focusing on a cross-section of 11,000 firms from 45 countries, Dittmar et al. (2003) show that firms in countries with poor shareholder

protection rights hold about twice as much cash compared to firms in countries with good shareholder protection. Consistent with agency theories, results in Pinkowitz et al. (2006) show that the relationship between cash holdings (dividends) and firm value is much weaker in countries with poor (strong) investor protection compared to other countries. Similarly, Kalcheva and Lins (2007) show that when country-level shareholder protection is weak, firm values are lower when management holds more cash whereas firm values are higher if management pays dividends.

Periods of high policy uncertainty aggravate the agency problems of free cash flows because these periods are associated with decreased real economic activities (Baker et al. 2016), depressed corporate capital investment (Gulen and Ion 2016), reduced capital flows and limited economic recovery (Bonaime et al. 2018). It follows that in such periods corporate cash reserve would increase which can be easily expropriated by mangers and turned into private benefits (Myers and Rajan 1998). As highlighted by several studies (e.g., Bae et al. 2012; Baek et al. 2004; Johnson et al. 2000; Mitton 2002) addressing the agency problems mitigates the diversion of corporate resources. Disgorging the cash by the management, especially during high-EPU periods when investment opportunities are poor, would mitigate the agency problems. In fact, consistent with the agency framework, the analysis by Attig et al. (2021) documents a robust positive association between policy uncertainty and different measures of firms' payout policy, implying a negative link between cash holding and policy uncertainty. Reducing firms' cash balance amid policy uncertainty mitigates the agency problems and disciplines the managers because, it will force them to go to the capital market to raise external finance and will subject them to external scrutiny by the market (Easterbrook 1984; Rozeff 1982; Jensen 1986). This leads to our competing hypothesis:

Agency Problems Hypothesis: Policy uncertainty is negatively related to corporate cash holdings.

3. Data

3.1. Measuring policy uncertainty

We use the Economic Policy Uncertainty (EPU) index of Baker et al. (2016) as our measure of policy uncertainty. This measure has been extensively used in the policy uncertainty literature (Bonaime et al. 2018; Brogaard and Detzel 2015; Gulen and Ion 2016; Nguyen and Phan 2017; Phan et al. 2019; Duong et al. 2020) and is available for the 19 countries in our sample. For the U.S., this measure is constructed as the monthly weighted average of three components, namely a count of the news articles that contain uncertainty-related key terms, dispersion in economic forecasts of government spending as a proxy for the uncertainty associated with future fiscal and monetary policy, and uncertainty about future changes in the federal tax code.

Baker et al. (2016) also develop this index for another 11 countries, including all G10 economies. For the other countries, other researchers (Cerda et al. 2016; Baker et al. 2013; Zalla 2017; Arbatli et al. 2019; Kroese et al. 2015; Davis 2016; Ghirelliet al. 2019; Armelius et al. 2017) employ a similar news-based methodology for the construction of a monthly uncertainty index. For example, for the U.S., the news-based component is constructed by counting the news articles from 10 large newspapers in the U.S. (*USA Today*, *Miami Herald*, *Chicago Tribune, Washington Post, Los Angeles Times, Boston Globe, San Francisco Chronicle, Dallas Morning News, New York Times*, and *Wall Street Journal*) that contain keywords such as "uncertainty" or "uncertain," "economic" or "economy," "Congress," "legislation," "White House," "regulation," "Federal Reserve," or "deficit." For other countries, researchers develop the index by conducting a similar text search on different numbers of large newspapers in those countries (i.e., the top five Canadian

newspapers, the largest newspaper in Ireland, etc.).[3] To obtain the index values for different countries, researchers adjust the set of keywords to control for the particularities of a given country and its linguistic characteristics. The keywords are identified in the native language of the country where the newspaper is published. Using the extracted data from the top newspapers in each country, researchers construct a normalized index of the volume of news articles discussing economic policy uncertainty. For our analysis, we follow the convention in EPU studies (e.g., Gulen and Ion 2016; Phan et al. 2019; Attig et al. 2021 to name a few) and define EPU as the natural logarithm of the arithmetic average of the monthly index values in each year.

3.2. Firm specific variables

Firm-level balance sheet data are obtained from COMPUSTAT North America and COMPUSTAT Global Fundamental Annual database. Following the literature, we eliminate all financial firms (SIC code 6000-6999) and all utilities (SIC code 4900-4999) since these industries are highly regulated. We remove firm-year observations with negative or missing values of cash holdings, and those with missing values for Standard Industrial Classification (SIC). Also, in order to strip out the effect of major corporate events such as mergers and acquisitions, we drop the observations in which the change in assets and sales are greater than 100% in two consecutive years. Finally, we only keep firms with at least four observations. We winsorize all the continuous variables at the top and bottom 1%. We choose to begin our sample period in 1991 due to limited country coverage before this period. Our final sample consists of 140,429 firm-year observations of 14,616 unique firms from 19 countries from 1991 to 2016.

[3] We thank professors Baker, Bloom, and Davis for providing the economic policy uncertainty data. For accessing the uncertainty data as well as more details about the measurement of the index in different countries, please refer to Baker, Bloom, and Davis (2016) and http://www.policyuncertainty.com/index.html

Panel A of Table 1 provides the summary statistics of the variables in our sample. Average EPU is 4.7. An average firm in our sample holds about 16% of its total assets in the form of cash and marketable securities. This ratio increases by about 10.5% when cash is excluded from total assets, indicating a cash-to-net asset ratio (Cash/NA) of 26.5%. The average firm has financed over 20% of its total assets by debt, and its capital expenditures are about 2.5% of its total assets. About 80% of our sample firms are dividend payers, with an average payout ratio of about 39%. Panel B reports the summary statistics of policy uncertainty and cash holding for each country. Brazil has the highest average EPU followed by China and France. The second part of Panel B shows that Singapore has the highest cash ratio, followed by China and Hong Kong.

[Insert Table 1 about here]

4. Empirical Findings

Following the literature (Bates, Kahle, and Stulz 2009; Harford, Mansi, and Maxwell 2008; Opler et al. 1999), we estimate panel regression model (1) for our multivariate specification in which $Cash_{i,t}$, our main dependent variable and defined as the ratio of cash and marketable securities to total assets, is cash holdings by company *i* in year *t*:

$$\begin{aligned} Cash_{i,t} = {} & \alpha_0 + \beta_1 EPU_{i,t} + \beta_2 MB_{i,t} + \beta_3 size_{i,t} + \beta_4 CF_{i,t} + \beta_5 NWC_{i,t} \\ & + \beta_6 CAPEX_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 Industry\ Sigma_{i,t} + \beta_9 RD_{i,t} \\ & + \beta_{10} Div\_dummy_{i,t} + \beta_{11} ACQ_{i,t} + Year\ FE + Firm\ FE + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Control variables are standard and widely used in the literature. Their detailed definitions are provided in Table A.1 in the Appendix. The coefficient of interest is β1. A significantly positive coefficient is consistent with the precautionary motive hypothesis, whereas a significantly negative coefficient is consistent with the agency problems hypothesis.

Throughout this study, we use clustered robust standard errors at the firm level to correct for within-firm correlations. As highlighted in Attig et al (2021), Cameron and Miller (2015) argue that having fewer than 20 clusters can give rise to "too few clusters" and bias the standard errors which is a more serious problem in unbalanced panel data. Thus, using clustered standard errors at the country level could bias them, since our sample is comprised of 19 countries or even less in our subsample analysis (see Cameron and Miller 2015; Petersen 2009; El Ghoul et al. 2020). Nonetheless, as a robustness check, we cluster the standard errors at the country level and also use two-way clustering by country and year.

4.1 Policy Uncertainty and BRIC Countries

We begin our analysis by reexamining some of the findings of the previous papers that study a similar relationship in the BRIC countries and in the U.S. In Panel A of Table 2, we restrict our sample period to that of Demir and Ersan (2017) and use their empirical model to reexamine their main results[4]. In Columns (1) and (2) following their specification, we can replicate their findings and show that there is a positive and significant relationship between EPU and cash holdings in BRIC countries. However, when we use firm and time fixed effects (instead of industry and time fixed effects that are used in their specification) in Columns (3) and (4), the sign of the EPU coefficient flips and becomes significantly negative.[5] This change in the sign of the EPU coefficient makes it clear that time invariant firm characteristics have a significant impact on the relationship between EPU and cash holdings. As discussed in Bertrand and Mullainathan (2003), Angrist and Pischke (2009), Armstrong et al. (2012), and Khan et al. (2016) the inclusion of both

[4] Demir and Ersan (2017) use shorter sample period of 2006-2015, trim variables at 5%, and do not use all the conventional control variables in cash holding studies as suggested by Opler et al. (1999) and Bates et al. (2009).
[5] Demir and Ersan (2017) use the average of raw monthly EPU (instead of logarithmic transformation) in their models and for consistency, we did the same in Panel A of Table 2. Given that raw EPU is relatively large, the estimated EPU coefficients in these regressions are small. Thus, to avoid scaling issues and reporting coefficients with three zeros after the decimal point, in columns (3) and (4) we rescaled the raw EPU by dividing it by 100.

year and firm fixed effects in a panel regressions resembles a generalized difference-in-differences approach that allows a causal interpretation in a regression setting. This specification, together with clustered robust standard errors at the firm-level, accounts for the cross-correlations among time-invariant unobservable firm characteristics and other control variables, unobservable aggregate time-trends, and within-firm serial correlation (Attig et al. 2021).

Moreover, when we use our entire sample period and employ our regression Model (1) with time and firm fixed effects, we continue to find a negative and statistically significant relationship between cash holdings and EPU for firms in BRIC countries, irrespective of whether we use cash over assets or cash over net assets as our dependent variable. These results are reported in Panel B of Table 2, and further confirm the negative link between EPU and cash holdings across firms in BRIC countries. Lastly, in Panel C of Table 2, we examine the link between EPU and cash holdings among U.S. firms. Similar to studies by Phan et al. (2019) and Duong et al. (2020), we obtain a significantly positive coefficient on EPU. This result establishes more confidence in our sampling procedure and empirical methodology.

[Insert Table 2 about here]

4.2. Baseline results

Our baseline results for our sample of non-U.S. firms show that similar to BRIC countries, firms lower their cash holdings in the face of policy uncertainty. Table 3 presents the main findings of the study. Focusing on Model (1), the coefficient on EPU is negative and both statistically and economically significant (β = -0.012 with t-stat = -7.39). A one standard deviation increase in policy uncertainty is associated with a 0.47% decrease in cash holding ratio. For an average firm in our sample (that has a cash holding ratio of 16%), a 0.47% decrease in the ratio represents about a 3% drop. We formally address endogeneity later in the paper in Section 6. However, to alleviate

endogeneity concerns to some extent at this point, in Model (2) we use lead of cash holdings ($Cash_{t+1}$) as the dependent variable, effectively estimating the impact of lagged EPU. Consistent with our baseline result, the coefficient on EPU remains negative and statistically significant with a magnitude comparable to that of Model (1). Our result is also robust to an alternative measure of cash holdings. In Model (3), we use cash over net assets as our dependent variable. Similar to the previous specifications, EPU has a negative and statistically significant coefficient. In Model (4) we use the change in cash holdings from the previous year as our dependent variable and find that the change in cash holdings is also negative and significant in the presence of uncertainty.

Furthermore, the current cash holding level reflects the cumulative outcome of all the prior cash holding decisions. Therefore, to provide an insight on how policy uncertainty affects the year-to-year change in cash holdings, we exploit the identity in cash flow statement. The sum of cash flows from operating, investing, and financing activities is equal to the annual net change in a firm's cash position. Using this sum (net cash flow) as the dependent variable in Model (5), we find a negative and statistically significant coefficient on EPU. In Models (6) and (7), we estimate Model (1) but cluster the standard errors by country and by both country and year to account for correlations among different countries in the same year and different years in the same country (See Peterson 2009). EPU continues to load significantly negative in both specifications. In Model (8) we include the lag of the cash ratio in the right-hand side of the panel regression to account for the fact that cash holding in year *t* is highly correlated with cash holding in year *t+1*. We find that the coefficient of the EPU is still negative and significant. Finally, in Model (9), we show that our main result is insensitive to the inclusion of the U.S. firms. Due to the established positive link between policy uncertainty and cash holdings in U.S. firms (Phan et al. 2019; Duong et al. 2020),

their inclusion in the sample reduces the absolute value of the EPU coefficient, but the coefficient still remains significantly negative (β = -0.008 with t-stat = -5.09).

[Insert Table 3 about here]

These results are in sharp contrast to the prediction of the precautionary motive hypothesis and are consistent with agency problems hypothesis. Our sample of non-U.S. firms manage their cash holdings down amid high policy uncertainty periods to mitigate the agency problems. Such periods are characterized by declining corporate capital investment (Gulen and Ion 2016), and lower real economic activities (Baker et al. 2016), which can increase firms' cash balance that could be easily extracted by the management for private benefits (Myers and Rajan 1998). By lowering the cash holdings, managers will be scrutinized by the market when they want to raise external capital to fund future investments (Easterbrook 1984; Rozeff 1982; Jensen 1986). Our results are also consistent with those of Attig et al. (2021) who find, using a similar sample of non-U.S. firms, that different measures of firms' payout policy are positively linked with EPU.

The coefficients on control variables are generally consistent with cash holdings literature. High-growth firms, usually characterized by their relatively high market-to-book ratios, are expected to hold more cash. Consistent with this argument, we see that market-to-book ratio (MB) is positively related to cash holdings. Size is negatively associated with cash holding, perhaps due to the fact that larger firms have better access to capital markets because of their lower information asymmetry. Firms with more cash flows are expected to have lower cash holdings since their cash flows offset their need for cash reserves. All these findings are common to and consistent with prior research in cash holdings literature (Opler et al. 1999; Phan et al. 2019, just to name two). Moreover, Opler et al. (1999) state that leverage and cash holdings have some common determinants but usually with opposite signs. Determinants that are associated with more cash

holdings are the same determinants that are associated with less debt. Therefore, our finding that more levered firms hold less cash, evident by a negative and statistically significant coefficient on leverage, is in line with established empirical evidence. Since acquisitions and capital expenditures are uses of cash, we expect their coefficients to be negative. Consistent with this logic, we find that acquisitions and capital expenditures are negatively associated with cash holdings.

4.3. Some Robustness Tests

An immediate concern with our analysis is the confounding effect of U.S. economic policy uncertainty. Due to its sheer size, complexity, and impact on the rest of the world's economy, the U.S. economy and, by extension, its economic policy uncertainty can influence uncertainty of other countries. Following Gulen and Ion (2016), Nguyen and Phan (2017), and Phan et al. (2019), we orthogonalize the economic policy uncertainty of each country in our sample with respect to that of the U.S. by regressing the EPU of each country on the EPU of the U.S. Having been purged of any potential confounding effect of U.S. policy uncertainty, the residuals of this regression (EPU_{resid}), by construction, represent a cleaner measure of policy uncertainty in each country.

Focusing on Model (1) in Table 4, we use EPU_{resid} as our measure of policy uncertainty. The coefficient on EPU_{resid} is negative and significant, indicating that the confounding effect of U.S. policy uncertainty is unlikely to have impacted our results. Moreover, EPU may pick up economic uncertainty that is unrelated to policy but nonetheless may affect corporate cash holdings. Thus, following international cash holdings literature (Dittmar et al. 2003; Kalcheva and Lins 2007), in the next two models, we include a series of country-level macroeconomic variables in our regression model that have been shown to affect cash holdings. In Models (2) and (3), EPU_{resid} and EPU are negative and significant, respectively, suggesting that it is unlikely that U.S. policy uncertainty or other nonpolicy-related economic uncertainty have affected our findings.

[Insert Table 4 about here]

A quick look at the Panel B of the Table 1 that breaks down our sample by country shows that firms in Japan, China, and Canada represent 37%, 16%, and 12% of the overall sample, respectively. In order to address the concern of overrepresentation of a particular country in our sample and whether firms in one country are driving the results, in the last three columns of Table 4, we reexamine our base model by excluding these highly represented countries from our sample. The coefficient of EPU is negative and significant in all three models, suggesting that the findings of the paper are not affected by anyone of these countries.

5. Where is Cash Going?

5.1. Dissecting the channels

Our results raise a natural question of what happens to cash? Where is cash going? The findings in Attig et al. (2021) provide a hint that cash may have been used, at least in part, for the payment of dividends. Nonetheless, we explore different channels through which cash may have been used. A change in a firm's cash position can be traced back to its cash flow from operating, investing, and financing activities. Specifically, uses of cash include investment in real assets or paying remuneration to providers of capital, either to creditors in the form of servicing debt or paying dividends to shareholders. To investigate this issue, first, we separately regress the cash flows from operating, investing, and financing activities on policy uncertainty. Focusing on Models (1) and (4) in Panel A of Table 5, we see that policy uncertainty has no effect on cash flow from operating activities in both univariate and multivariate setting.[6] Focusing on investing activities in a univariate setting, policy uncertainty has a positive and statistically significant coefficient in Model (2), suggesting that it increases the cash position of firms through investment activities. However,

[6] Given that cash flow variable can be highly correlated with cash flow from operating activities, in an unreported analysis we exclude "cash flow" from the regression. Result does not change. EPU coefficient remains insignificant.

this relation loses its statistical significance in a multivariate setting in Model (5). Results in Models (3) and (6) suggest that cash flow from financing activities is negatively affected by policy uncertainty. Together, these results indicate that the reduction in cash holdings in the presence of policy uncertainty is through a channel categorized under the financing activities.[7]

Next, we examine leverage and dividend payout, two of the main components of cash flow from financing activities that could decrease a firm's cash position. In addition, we also examine the link between corporate capital investment and policy uncertainty. These results are reported in Panel B of Table 5. Using the main regression model in Frank and Goyal (2009), we first examine the relationship between EPU and leverage in Panel B. If servicing debt is a channel to explain the decrease in cash in the presence of policy uncertainty, EPU should have a negative and statistically significant coefficient. However, this coefficient is significantly positive. [8]

Next, we examine the link between EPU and corporate investment. A positive and significant coefficient on EPU would indicate that in the presence of policy uncertainty, our sample firms use their cash holdings to fund corporate investment. However, following Gulen and Ion (2016), we find that corporate capital expenditure decreases in the face of policy uncertainty. This result is consistent with the main finding in Gulen and Ion (2016), who use U.S. firms and show that periods

[7] The number of observations in these regressions is significantly smaller compared to that of our previous regressions. The reason is that the cash flow statement information is missing for a lot of non-US firms.

[8] In an unreported analysis, we find an increase in short-term debt in the presence of policy uncertainty. We run separate regressions similar to the one in the first column of panel B of Table 5 but with long-term debt and short-term debt as the dependent variable. EPU coefficient is insignificant (β=0.003; t-stat=1.26) when long-term debt is the dependent variable and positive and significant (β=0.008; t-stat=3.22) when short-term is the dependent variable. This positive coefficient indicates that our sample firms increase their short-term debt in an effort to mitigate the agency problems of free cash flows (Jensen 1986) and they do so more credibly by committing their future cash flows to service debt. Moreover, given the significant year-to-year variation in policy uncertainty, it is more sensible for firms to manage their leverage ratio upward by increasing short-term rather than long-term debt when facing policy uncertainty. Nevertheless, this result does not imply a reduction in cash holdings. Further, in another unreported analysis, we regress the change in the long-term debt and the change in book value of equity on policy uncertainty and find that the EPU coefficient is insignificant in both cases, indicating that policy uncertainty is insignificantly related to issuance of debt and equity capital.

of high policy uncertainty are associated with declining corporate capital investment. As pointed out by Floyd, Li, and Skinner (2015), this finding should lead to higher cash holdings, not less.

[Insert Table 5 about here]

In the third column, we examine dividend payments as a channel to explain the reduction in cash when policy uncertainty increases. We follow Attig et al. (2021) and Brockman and Unlu (2009) and estimate the relationship between policy uncertainty and dividend payout ratio. Confirming the main result in Attig et al. (2021), we find that the coefficient on EPU is positive and significant, suggesting that an increase in dividend payouts is a possible channel through which our sample firms reduce their holdings of cash when policy uncertainty increases. As argued by Attig et al. (2021), this result is consistent with the predictions of the agency framework. Thus, our results combined with those of Attig et al. (2021) provide credible evidence that for non-U.S. firms mitigating the agency problems during periods of high policy uncertainty is critical and they do so by managing their cash holdings down and their dividend payout up.

5.2. The impact on firm value

Our results thus far indicate that when facing economic policy uncertainty, our sample firms decrease their cash holdings to ameliorating the managerial agency problems; and our evidence as well as that of Attig et al. (2021) suggest that they do so, by paying out their cash holdings. It follows from this agency framework that such a response to policy uncertainty should be valued by shareholders of our non-U.S. firms. In this section we examine the reaction of the shareholders to these changes in the corporate policies.

Following Kalcheva and Lins (2007), we estimate the marginal value of these responses to policy uncertainty. In Table 6, we interact EPU with cash holdings, dividend dummy, leverage, and capex, and sequentially add them to the regression model used in Kalcheva and Lins (2007).

We orthogonalize cash holdings by using the residuals of regressing cash on EPU and other control variables included in regression Model (1). We use orthogonalized cash because in our base model we show that cash holding is a function of EPU. In a similar vein, we orthogonalize leverage using Frank and Goyal (2009) specification as well as Capex using Gulen and Ion (2016) since in Panel B of Table 5 we establish that firms' capital investment and leverage policy react to EPU. We note that these are the model specifications employed for the analysis reported in the first two columns of Panel B of Table 5.

Model (1) in Table 6 shows that EPU has a negative and significant impact on the value of the firm. In fact, EPU has a significant adverse effect on firm value in all specifications. Moreover, we find that when facing policy uncertainty, decreasing cash holdings (Model 2) and increasing the propensity to payout dividends (Model 3) have marginal positive values. In addition, we find that increasing leverage (Model 4) and reducing capital investment (Model 5) in the presence of policy uncertainty also have marginal positive values, though the effects are statistically insignificant. Similar results emerge in specification (6), where all the interaction terms are included in one regression. Collectively, the results in Tables 5 and 6 are consistent with the prediction of the agency problems framework. These findings suggest that firms' responses to policy uncertainty, particularly the response in their cash holdings policy, are aimed at ameliorating the agency problems and are, thus, viewed positively by (minority) shareholders and add value to the firm.

[Insert Table 6 about here]

6. Addressing Endogeneity

Throughout our analysis so far, we have included both firm and year fixed effects in all our specifications. As discussed earlier, Bertrand and Mullainathan (2003), Angrist and Pischke

(2009), Armstrong et al. (2012), and Khan et al. (2016) argue that the inclusion of both year and firm fixed effects in a panel regressions resembles a generalized difference-in-differences approach that improves the causal interpretation. Nevertheless, in this section, we formally address this issue to help establish more confidence in the identification of the documented effects.

6.1. Instrumental variable

Corporate cash holdings and policy uncertainty can be jointly correlated with unobservable variables, giving rise to endogeneity in the form of omitted variable bias. Thus, following the common practice in the literature, we us an IV regression model to address endogeneity. Depending on the direction with which the unobserved factors affect EPU and cash holdings, the EPU coefficient estimated in our main regression may be upward or downward biased (Jiang 2017). A proper instrument for our study is a variable that has a significant relationship with policy uncertainty but is unlikely to have a direct effect on corporate cash holdings except indirectly through its relationship with policy uncertainty. Several studies (McCarty et al. 1997; Poole and Rosenthal 2000; McCarty 2004; McCarty 2012; Attig et al. 2021) argue that political partisanship impedes legislation building, creates policy gridlock, and produces greater variation in policy.

As highlighted by Attig et al. (2021), six of the ten recent EPU studies that employed IV approach to address endogeneity, use political polarization as an instrument. Building on this notion and following Attig et al. (2021), we use political fractionalization (FRAC) from the Database of Political Institutions as our instrument. Varying from 0 to 1, this measure tracks the probability that two deputies picked at random from the legislature will be of different parties. Greater values imply a more divided legislature. On the one hand, holding everything else constant, we expect that greater values of FRAC to be associated with higher policy uncertainty. On the other hand, it is unclear how higher levels of FRAC would affect corporate cash holdings (and

dividend payouts) other than through its impact on policy uncertainty. Thus, political fractionalization satisfies the necessary conditions as an instrument.

We report the results of the first and the second stage regressions in Table 7. The coefficient on our instrument, FRAC, is positive and highly significant. Kleibergen–Paap *rk LM* underidentification test statistics rejects the null that model is under-identified, indicating that the model is well identified. Kleibergen–Paap Wald *rk* F statistic rejects the null that the model is weakly identified. Cragg-Donald weak identification test statistics, and Wald test statistics of Anderson-Rubin weak instrument tests are also significant, further confirming the relevance of our instrument. In the second stage, consistent with our main finding in Table 3, the coefficient on the instrumented EPU is negative and statistically significant.[9]

[Insert Table 7 about here]

6.2. Simultaneous Equations

Responses in corporate policies to EPU are likely determined jointly. A firm's cash holdings may decrease as it pays out dividends. But at the same time, having an existing high payout policy in place could simultaneously increase the propensity for the firm to hold less cash. A similar argument can be made for other corporate policies. For instance, increasing leverage may increase the cash balance. But having high cash balance could simultaneously increase firms' debt capacity, allowing them to borrow more. As a result, the residuals of OLS regressions for cash holdings, payout ratio, leverage, and capital investment can be correlated, giving rise to endogeneity in the form of simultaneity, which in turn could lead to biased estimates in our OLS regressions. Thus,

[9] We note that the EPU coefficient estimated using the IV approach is substantially larger than those reported in Table 3 which could be due to the IV model identifying the local average treatment effect of the endogenous variable on the outcome variable (Imbens and Angrist 1994). Moreover, Jian (2017) also argues that "there is no reason to expect that the causal effects in close to 85% of all the cases studied by researchers should be predominantly higher than the simple correlational effect". Thus, we are hesitant to claim causality between EPU and cash holdings.

to address this issue, we have to estimate the effect of policy uncertainty on cash holdings and all other corporate policies simultaneously. We use a simultaneous equations framework in which the impact of policy uncertainty on cash holdings, payout, leverage, corporate investment policies are estimated jointly by a two-stage least squares system of equations.

As before, our cash model is based on Bates et al. (2009). The models for payout, leverage, and corporate investment policies are similar to those used in Panel B of Table 5. Specifically, the dividend model is based on Attig et al. (2021) and Brockman and Unlun (2009). Leverage model is based on Frank and Goyal (2009) and we follow Gulen and Ion (2016) for the specification of corporate investment. Results are reported in Table 8.

In Panel A, we use a system of simultaneous equations to estimate the impact of EPU on corporate cash holdings and their payout policy. In Panel B, we expand the system of simultaneous equations to estimate the impact of EPU on cash holdings, payout, leverage, and corporate capital investment policies. Consistent with our earlier findings, EPU coefficient is negative and statistically significant for the cash equation in both panels. Similarly, the EPU coefficient is significantly positive for the dividend equation in both panels. This result is consistent with the one reported in Panel B of Table 5, and their magnitudes are also similar. These results combined with our earlier findings and those of Attig et al. (2021) provide compelling evidence that non-U.S. firms' response to policy uncertainty is mainly aimed at ameliorating the agency problems and they do so, at least in part, by paying out their cash holdings to their shareholders.[10]

[10] We acknowledge that our system of simultaneous equation reported in Table 8 does not include firm fixed effects. Unfortunately, we do not have the computational power to estimate these models with firm fixed effects. Instead, we include industry, year, and country fixed effects. Imbens and Woolridge (2009) argue that the simultaneous inclusion of industry, year, and country fixed effects ensures that the estimated coefficient captures the effect of within-country changes in policy uncertainty over time and not just cross-sectional correlations. They show that with this empirical design, each year, a given country could be classified either as treatment or control and thus the EPU coefficient can be interpreted as the difference-in-differences estimator.

[Insert Table 8 about here]

7. Subsample analysis

There is substantial variation in the country-level agency problems as well as in the legal environment across countries. In fact, an extensive literature documents the significant role that countries still play in corporate financial policies. Several studies show that firms outside the U.S., especially those in developing countries, face a different set of agency problems, including inefficient judicial and legal systems and law enforcement, low quality of accounting standards, pervasive weak financial systems, corruption, and the crucial role of political connection (LLSV 1998, 1999, and 2000; Claessens et al. 2000; Stulz 2005; Faccio et al. 2006; Ayyagari et al. 2010a and 2010b; Murphy et al. 1993). In their seminal paper, LLSV (1998) show that the laws associated with investor protection differ across countries and that these differences have significant consequences for corporate finance. Specifically, in a later study LLSV (2000) show that firms in common law countries, that provides the best protection for external shareholders, pay substantially more dividends to their shareholders, because shareholders in these countries use their legal power to force management to disgorge cash for firms. Agency view predicts that when shareholders are empowered, as they are in common law countries, they force managers to disgorge cash. Thus, the cross-country prediction of this framework is that greater shareholder rights are associated with lower cash holdings. Several studies document results consistent with these predictions (e.g., Dittmar et al. 2003; Pinkowitz et al. 2006; Kalcheva and Lins 2007).

In this section, we delve deeper in our investigation of the relationship between EPU and cash holdings by focusing on different country characteristics. As discussed above, the agency framework suggests that the relationship between EPU and cash holdings should be moderated by countries' legal environment in terms of their legal protection of external shareholders.

Specifically, we expect that the decrease in cash holdings in the presence of policy uncertainty to be more (less) pronounced in countries where shareholders are more (less) empowered to force managers to disgorge cash. We provide empirical evidence consistent with these predictions in Table 9.

In Model (1), we examine the effect of EPU on cash holding for emerging economies in our sample. We determine a country to be an emerging economy based on MSCI classification. The countries classified as emerging economies include Brazil, China, India, Korea, Mexico, and Russia. Emerging economies are not known to have strong shareholder protection right. Therefore, to the extent that emerging economies have lax shareholder rights, it would be more difficult for shareholders of firms in these countries to extract cash from firms in the presence of policy uncertainty, and thus, reduction in cash holdings in these countries should be less pronounced. Consistent with this prediction, the interaction term between emerging dummy and EPU is positive and significant. We find similar results for firms in BRIC countries in Model (2). Cash holdings decrease at a lower rate among firms in BRIC countries as suggested by the significantly positive coefficient on the interaction term between EPU and BRIC.

Next, we study the impact of corruption on cash holdings in the presence of EPU. Corruption has received considerable academic attention (Shleifer and Vishny 1993; Murphyet al. 1993; Shleifer and Vishny 1994; Acemoglu and Verdier 2000; Ayyagari et al. 2010a, 2010b). Our corruption index is based on Kaufmann et al. (2010) and is obtained from the World Bank website. We classify our sample countries into high and low corruption, using an indicator variable. Corruption dummy is one if a country's corruption score is below the sample median (lower values of corruption index implies more corruption), and zero otherwise. We argue that due to the pervasive corruption, shareholders of firms in countries with high level of corruption cannot

effectively force managers to disgorge cash. Therefore, the drop in cash holdings in the presence of policy uncertainty should be less pronounced among firms in these countries, suggesting a positive coefficient on the interaction term between the corruption dummy and the EPU. In Model (3) we examine how the effect of EPU on cash holdings is moderated by corruption at the country level. The result in Model (3) supports our prediction. The interaction term is significantly positive, implying that the decline in cash holdings is smaller among firms in corrupt countries.

The overall level of governance in a country that includes factors such as government effectiveness, regulatory quality, accountability, rule of law, political stability, and corruption plays a substantial role in corporate finance. Results in Doidge et al. (2007) and Harford et al. (2008) are consistent with this assertion. We create a measure of country level corporate governance using the World Governance Indicators (WGI) of the World Bank Database. We define a poor governance dummy variable. This dummy variable equals one if a country's WGI is below median and zero otherwise. Similar to our argument for corruption, shareholders of firms in countries with poor governance are unable to effectively force management to disgorge cash. Thus, we expect that cash holdings of firms in these countries to decrease at a lower rate compared to firms in countries with good governance during high-EPU periods. Our result in Model (4) is in line with this prediction. The interaction term between EPU and poor governance dummy is significantly positive.

Finally, LLSV (2000) state that cross-country variation in legal environment and shareholders' rights affects the ability of outside shareholders to extract cash from the firm and that countries with common law origins provide the best minority shareholder protection compared to civil law origins. Based on our agency framework, we expect the decrease in cash holdings to be more pronounced among firms in common law countries since shareholders of firms in common law

countries have stronger and more protected rights to force management to disgorge cash in the presence of policy uncertainty. We examine this prediction in Model (5).

We use the data in LaPorta et al. (1998) to classify our sample into countries with common law and civil law legal origins. Result in Model (5) is consistent with this our prediction. The interaction term between EPU and the common law dummy is positive and significant. We note the EPU coefficient is negative and significant in all four specifications.

[Insert Table 9 about here]

Overall, the results of the subsample analysis fit consistently within the agency theory framework and demonstrate that the response in firms' cash holding policy amid policy uncertainty is moderated by the governance and legal characteristics of the sample countries. While firms generally lower their cash holdings in response to policy uncertainty, this reduction could be more (less) pronounced if shareholders are (not) empowered to force managers to disgorge cash from the firms.

8. Lines of credit

Our empirical evidence is consistent with the agency problems framework and points to a negative relationship between policy uncertainty and cash holdings. However, this documented negative link between cash holdings and policy uncertainty raises an interesting question. Is precautionary motive irrelevant for our sample firms? Do our sample firms not care about the adverse impact of economic policy uncertainty on financing friction and access to external financing? Do they not care about having a buffer against such an adverse effect that may prevent them from funding positive NPV projects? To answer these questions, we explore another important source of liquidity and study the choice between corporate cash holdings and lines of credit and the cross-country heterogeneity it exhibits.

Several studies on liquidity management in corporate finance focus on the choice between cash holdings and lines of credit and their substitutability (Sufi 2009; Yun 2009; Campello et al. 2011; Acharya, Almeida, and Campello 2013; Acharya et al. 2014, among others). Most studies are focused on the U.S., but the evidence in those that conduct cross-country analyses indicates that cash is viewed and used very differently by firms outside the U.S. Particularly, the findings in a survey of CFOs in public and private firms in 28 countries by Lins, Servaes, and Tufano (2010) indicate that lines of credit are the dominant form of corporate liquidity and are strongly linked to financing investment opportunities. In other words, in terms of funding future investment opportunities, the survey shows that lines of credit are strongly related to a firm's need for external financing.

This insight suggests that policy uncertainty may evoke heterogenous responses by firms towards cash and lines of credit. To the extent that the precautionary motive implies that in the presence of costly external financing exacerbated by economic policy uncertainty, firms hold more liquidity as a buffer against negative shocks to their cash flows that may preclude them from undertaking positive NPV projects, and to the extent that lines of credit are the dominant form of liquidity for funding projects in an international sample, it is more likely for the precautionary motive to be manifested in lines of credit for our sample firms rather than cash that is more vulnerable to expropriation by managers and can be turned into private benefits (Myers and Rajan 1998). We investigate this issue and the results, reported in Table 10, confirm this conjecture.

[Insert Table 10 about here]

If a precautionary motive is more likely to be manifested in lines of credit in the presence of policy uncertainty for our sample instead of cash, we expect to observe a positive relationship between EPU and lines of credit. We obtain lines of credit data from Standards and Poor's Capital

IQ. Since the data on lines of credit is sparse before 2002, our sample period for these tests is 2002 to 2016. To investigate the link between lines of credit and policy uncertainty, we follow empirical specification of Sufi (2009). In the first specification, the dependent variable is an indicator that is equal to 1 if a firm has a line of credit and 0 otherwise (*hasline*). The coefficient on EPU indicates that for a one standard deviation increase in policy uncertainty, the probability of having a line of credit increases by about 5.6% (0.143×0.395) for an average firm in our sample, suggesting a positive link between policy uncertainty and lines of credit.

In the second and the third columns, the dependent variable is equal to 1 if a firm's line of credit has increased from the previous year and 0 otherwise. To be consistent with the rest of the paper, in the second column we include firm and year fixed effects. This is despite the fact that the dependent variable is determined by the change in a firm's lines of credit and thus, time-invariant firm characteristic must have been canceled out, making it theoretically unnecessary to include firm fixed effects. As an alternative, in the third column, instead of firm and year fixed effects, we use country, industry, and year fixed effects. While the EPU coefficient is statistically insignificant in the second column, it is significantly positive in the third one. In the last three columns, the dependent variables are unused lines of credit scaled by total assets, net assets, and total liquidity, respectively. The coefficient on EPU is positive and highly significant in all specifications, further confirming the positive association between policy uncertainty and lines of credit.

These results indicate that policy uncertainty elicit two different responses by our sample firms. On the one hand, according to the agency framework, they pay out their cash holdings to their shareholders to ameliorate the agency problems. On the other hand, as predicted by the precautionary motive, they do increase their lines of credit to buffer against negative shocks to their cash flows that could prevent them from taking on value maximizing projects. Hence, results

suggest that our sample firms do care about the adverse impact of policy uncertainty on financing friction and access to external financing; however, for these firms, this is an issue managed through lines of credit rather than cash. Thus, a negative relationship between cash and policy uncertainty does not imply irrelevance of precautionary motives for our sample firms. It simply indicates that the precautionary motive is manifested elsewhere, in lines of credit.

9. Conclusion

We examine the relationship between economic policy uncertainty and cash holdings of non-U.S. firms from 19 countries between 1991 and 2016. Contrary to the direct and indirect documented positive relationships between policy uncertainty and cash holdings for U.S. firms (Gulen and Ion 2016; Nguyen and Phan 2017; Bonaime et al. 2018; Phan et al. 2019; Duong et al. 2020), we find a robust negative association between policy uncertainty and cash holdings. We provide evidence that is consistent with the agency problems framework for corporate cash holdings. We address endogeneity concerns through the use of an instrumental variable and system of simultaneous equations and find that policy uncertainty remains negatively associated with cash holdings. Further, consistent with the agency view, our subsample analyses show that the decline in cash holdings has cross-sectional variation and is more pronounced in countries with stronger shareholder rights that allows them to force management to disgorge the cash.

The main implication of our results is that substantial variation in country characteristics, e.g., the legal environment, in an international sample may lead to dynamics that are completely different from, and at times opposite to, those of the U.S. and that extrapolating findings based on U.S. data to other countries could be misleading. Overall, the sharp contrast between our results and those of the prior studies that focus on the U.S. highlights the significance of the agency problems and the crucial role that country attributes still play in corporate finance.

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Appendix

Table A.1: Variable Description

Variables	Description
Cash	Cash and marketable securities over total assets [che/at]
EPU	We take the natural logarithm of the mean of the index values per year
Cash/na	Cash and marketable securities over net assets [che/(at-che)]
MB	Market to book ratio is the ratio of total assets plus market value of equity minus book value of equity divided by total assets [(at + (prcc_f*csho)-ceq)/at]
Size	Size is the natural logarithm of the deflated total assets [log(at/cpi)]. We use the exchange rate data available in the Compustat Global database to convert a firm's total asset to U.S. dollars.
Cash Flow	Cash flow is earnings before interest and taxes, but before depreciation and amortization, less interest, taxes, and common dividends, divided by total assets [(oibdp - txt - xint - dvc)/at]
CF_lag_at	Is the ratio of earnings before interest and taxes, but before depreciation and amortization, less interest, taxes, and common dividends, divided by lag of total assets [(oibdp - txt - xint - dvc)/lag(at)]
NWC	Defined as net working capital minus cash over total assets [(wcap-che)/at]
CAPEX	Capital expenditures to assets [capx/at]
Leverage	Total debt over total assets [(dltt + dlc)/at]
Industry Sigma	Industry sigma is defined as the mean of the standard deviation of the cash flows over the past 10 years by year and two-digit industry code.
RD	Defined as the ratio of Research and Development expenditure over the sales. We replace missing values of R&D expenditure by zeros. [xrd/sale]
DIV_DUM	Is an indicator variable that is equal to one if common dividends are non-zero. We replace the missing values of dividends by zero.
ACQ	Acquisitions divided by total assets [aqc/at]
Payout Ratio	Ratio of dividends declared on common shares (dvc) to net income before extraordinary items (ib). We set this value to missing if the dividend payer has negative earnings unless dvc is zero.
RE	Ratio of retained earnings (re) over total assets (at)
TE	Total equity is the ratio of common shareholder equity (ceq) over total assets (at)
ROA	Return on assets is the ratio of net income before extraordinary items (ib) over total assets (at)
SGR	Is the sales growth rate which is the ratio of the current year sales minus last year's sales over last years sales
Profitability	Is the ratio of operating income before depreciation (oibdp) over total assets (at)
Mature	Is an indicator variable that is equal to 1 if firm age is greater than 5 years and 0 if age is less than 5 years.
Tangibility	Is the ratio of property, plant, and equipment (ppent) over total assets (at)
Median_ind_lev	Is the median of the leverage ratio for each country, year, and industry (sic)
TobinQ	Is the ratio of total assets minus book value of equity plus market value of equity over total assets ((at-ceq+mve)/at)
CF from Operating	Net cash flow from operations divided by total assets (oancf/at)
CF from Investing	Net cash flow from investing divided by total assets (ivncf/at)
CF from Financing	Net cash flow from financing divided by total assets (fincf/at)
Net Cash	Sum of net cash flows from operations, investing, and financing divided by total assets
Cash_orth	Residuals of regressing cash on EPU and other control variables included in regression Model (1)
Leverage_orth	Residuals of regressing leverage on EPU and other control variables according to the specification in Frank and Goyal (2009).

Variables	**Description**
Capex_orth	Residuals of regressing Capex on EPU and other control variables according to the specification in Gulen and Ion (2016).
Hasline	This is an indicator variable that is 1 if the firm has either used or unused lines of credit and 0 otherwise. The data for line of credit is obtained from Standard and Poor's Capital IQ website.
Increase in LOC	This is an indicator variable that is 1 if the unused line of credit in year *t* is more than year *t* - 1and 0 otherwise.
Unused LOC/na	This is the ratio of the unused portion of line of credit over the assets net of cash. (unused line/(at-che))
Unused LOC/Liq	This is the ratio of the unused portion of line of credit over total liquidity defined as unused line plus cash. (unused line/(unused line + che))
Cash Flow Vol.	The median of the standard deviation of cash flows over the past 10 years by country, fiscal year, and 2-digit industry SIC codes
Sales Vol.	The median of the standard deviation of sales over net assets ratio over the past 10 years by country, fiscal year, and 2-digit industry SIC codes.
Age	The natural logarithm of the number of years since the first observation appears in Compustat
Net Worth	Cash adjusted and calculated as total assets minus total liabilities minus cash divided by net assets.
Tangible assets	The ratio of tangible assets over net assets.
Common Law	Equals one if the origin of the commercial law of a country is English Common Law, and zero otherwise. Source: La Porta et al. (1998).
Frac	political fractionalization from the Database of Political Institution. Varying from 0 to 1, this measure tracks the probability that two deputies picked at random from the legislature will be of different parties.
StockMarket_cap	Stock market capitalization to GDP obtained from the World Bank
PrivateCredit_GDP	Private credit by deposit money banks and other financial institutions to GDP obtained from the World Bank
GDP_PC	GDP per capita obtained from the World Bank database
GDP_growth	Is the growth in the GDP obtained from the World Bank database
Creditor rights	Creditor rights index ranges from 0 to 4 and is from Djankov et al. (2008) and can be obtained from: https://scholar.harvard.edu/shleifer/publications?page=3
High Governance	High Governance is an indicator variable that is equal to 1 if the country's WGI is greater than the median value of WGI. The variable WGI is the average of the six components (voice and accountability, regulation quality, political stability, government effectiveness, rule of law, and corruption) of the Worldwide Governance Indicators available at http://databank.worldbank.org/
High Corruption	High corruption is an indicator variable that is equal to 1 if a country's corruption index is below the median corruption value. Control of Corruption captures perceptions of the extent to which public power is exercised for private gain and it is ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Voice and Accountability	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Rule of Law	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Regulatory Quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector

Variables	**Description**
	development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Political Stability	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Government Effectiveness	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/
Corruption	Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. available at http://databank.worldbank. org/

Table 1: Summary statistics

Panel A: Descriptive Statistics

	MEAN	SD	MIN	P50	MAX	N
EPU	4.707	0.395	3.296	4.704	6.297	140429
Cash/Assets	0.162	0.147	0.000	0.122	0.893	140429
Cash/Net Assets	0.265	0.479	0.000	0.139	8.351	140427
MB	1.576	1.312	0.501	1.162	13.275	140429
Size	5.848	1.711	1.039	5.726	10.527	140429
Cash Flow	0.038	0.113	-1.122	0.048	0.254	140429
NWC	0.020	0.170	-0.706	0.020	0.531	140429
CAPEX	0.025	0.061	0.000	0.001	0.513	140429
Leverage	0.207	0.178	0.000	0.183	1.000	140429
Acquisition	0.005	0.025	-0.002	0.000	0.228	140429
R&D	0.012	0.037	0.000	0.000	0.493	140429
Dividend Dummy	0.795	0.404	0.000	1.000	1.000	140429
Industry Sigma	0.035	0.029	0.007	0.027	0.194	138763
Payout Ratio	0.389	0.572	0.000	0.247	3.742	129911

Panel B: Mean EPU and cash holding by country

	EPU		Cash Holding		
Country	Mean	Std.Dev	Mean	Std.Dev	N
AUS	4.522	0.436	0.117	0.146	4511
BRA	4.935	0.343	0.163	0.136	1144
CAN	4.795	0.447	0.153	0.209	16392
CHN	4.902	0.460	0.199	0.145	22440
DEU	4.715	0.299	0.125	0.134	4669
ESP	4.626	0.355	0.097	0.088	590
FRA	4.871	0.491	0.151	0.138	1923
GBR	4.659	0.575	0.116	0.134	10171
HKG	4.739	0.398	0.197	0.153	946
IND	4.601	0.413	0.111	0.135	9016
IRL	4.464	0.336	0.135	0.122	463
ITA	4.673	0.240	0.126	0.106	1096
JPN	4.633	0.248	0.177	0.125	51666
KOR	4.765	0.352	0.156	0.133	8112
MEX	4.157	0.318	0.122	0.110	139
NLD	4.474	0.313	0.100	0.110	668
RUS	5.078	0.260	0.099	0.127	699
SGP	4.672	0.347	0.210	0.151	2666
SWE	4.509	0.167	0.144	0.151	3118
Total	4.707	0.395	0.162	0.147	140429

Panel A reports the descriptive statistics on key variables for our sample of international publicly traded firms from the 1991-2016. Definition of all the variables are provided in Table A.1 in the Appendix. Panel B reports the summary statistics of policy uncertainty and cash holding ratio for each country in our sample.

Table 2: EPU and BRIC Countries Revisited

Panel A: Demir and Ersan (2017)				
VARIABLES	(1) Cash/na	(2) Cash/na	(3) Cash/na	(4) Cash/na
EPU (levels)	0.002***	0.001***	-0.026***	-0.015***
	(21.10)	(9.09)	(-5.12)	(-3.10)
MB		0.045***		-0.006**
		(15.61)		(-2.16)
Leverage		-0.661***		-0.410***
		(-30.54)		(-16.28)
ROA		0.336***		0.318***
		(9.12)		(10.09)
Payout ratio		-0.014		-0.042***
		(-0.86)		(-4.33)
NWC/na		-0.128***		-0.197***
		(-6.12)		(-8.91)
Size		0.013***		-0.034***
		(5.02)		(-5.01)
Constant	0.021*	0.144***	0.289***	0.570***
	(1.82)	(7.96)	(41.99)	(14.78)
Observations	33,261	32,837	32,936	32,509
R-squared	0.0688	0.2559	0.6787	0.6959
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes

	Panel B: Base Model in BRIC Sample				Panel C: US Sample
	(1)	(2)	(3)	(4)	(1)
VARIABLES	Cash/na	Cash/na	Cash	Cash	Cash
EPU	-0.045***	-0.029***	-0.013***	-0.011***	0.466***
	(-5.44)	(-3.30)	(-4.55)	(-4.05)	(3.47)
MB		0.000		0.001	0.009***
		(0.11)		(0.62)	(13.46)
Size		-0.007		0.005**	-0.007***
		(-0.82)		(1.98)	(-4.11)
Cash Flow		0.033		0.036**	-0.026***
		(0.54)		(2.38)	(-4.29)
NWC		-0.443***		-0.170***	-0.175***
		(-12.91)		(-16.29)	(-22.43)
CAPEX		-2.166***		-0.550***	-0.212***
		(-5.92)		(-5.79)	(-20.24)
Leverage		-0.580***		-0.269***	-0.232***
		(-17.35)		(-24.44)	(-36.13)
Industry Sigma		0.396*		0.070	0.214***
		(1.68)		(1.04)	(3.45)
RD/Sale		-1.154***		-0.346***	-0.152***
		(-4.01)		(-4.03)	(-7.39)
DIV_DUM		0.011		0.010***	0.004*
		(1.34)		(3.72)	(1.72)
ACQ		-1.308***		-0.486***	-0.251***
		(-7.49)		(-9.81)	(-27.00)
Constant	0.492***	0.582***	0.233***	0.252***	-1.917***
	(12.21)	(9.67)	(17.43)	(13.52)	(-2.99)
Observations	33,298	32,734	33,298	32,734	94,853
R-squared	0.6509	0.6768	0.6787	0.7165	0.1335
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel A presents the coefficient estimates of regressing cash, defined as the ratio of cash and marketable securities over net assets, on economic policy uncertainty and a set of control variables that are based on Demir and Ersan (2017) in the BRIC countries. Models (1) and (2) have year and industry fixed effects, whereas Models (3) and (4) have year and firm fixed effects. Panel B presents the results of our empirical model for BRIC countries using a set of more conventional control variables as implemented by Bates et al. (2009). The dependent variable in Models (1) and (2) is cash over net assets and in models (3) and (4) is cash over total assets. all the regressions include firm and year fixed effects. In Panel C, we present the results of our regression for the U.S. sample only. The definitions of the control variables can be found in Table A.1 in the Appendix. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 3: Cash holding and economic policy uncertainty

VARIABLES	(1) Base Model	(2) Lead Cash	(3) Cash/na	(4) ΔCash	(5) Net cash flow	(6) Country cluster	(7) country year cluster	(8) lag cash in RHS	(9) With US
EPU	-0.012***	-0.009***	-0.031***	-0.002**	-0.024***	-0.012**	-0.012*	-0.005***	-0.008***
	(-7.39)	(-4.98)	(-5.29)	(-1.99)	(-4.46)	(-2.29)	(-2.09)	(-4.44)	(-5.09)
MB	0.007***	0.004***	0.021***	0.001***	0.024***	0.007	0.007	0.003***	0.008***
	(10.20)	(6.64)	(6.69)	(2.70)	(10.13)	(1.64)	(1.70)	(5.80)	(17.13)
Size	-0.007***	-0.010***	-0.034***	0.005***	-0.007*	-0.007**	-0.007**	0.002**	-0.007***
	(-4.91)	(-5.95)	(-5.19)	(5.68)	(-1.89)	(-2.18)	(-2.23)	(1.99)	(-5.76)
Cash Flow	-0.045***	-0.022**	-0.249***	0.004	0.230***	-0.045**	-0.045**	-0.023***	-0.032***
	(-5.16)	(-2.28)	(-5.39)	(0.48)	(11.39)	(-2.26)	(-2.27)	(-2.77)	(-6.62)
NWC	-0.183***	-0.083***	-0.446***	-0.121***	-0.074***	-0.183***	-0.183***	-0.156***	-0.180***
	(-29.25)	(-13.84)	(-19.88)	(-29.46)	(-3.83)	(-5.77)	(-5.89)	(-34.47)	(-35.25)
CAPEX	-0.144***	-0.141***	-0.696***	-0.343***	-0.269***	-0.144***	-0.144***	-0.247***	-0.194***
	(-10.75)	(-10.24)	(-11.05)	(-19.75)	(-8.49)	(-12.14)	(-12.92)	(-16.98)	(-23.45)
Leverage	-0.235***	-0.139***	-0.563***	-0.042***	-0.027*	-0.235***	-0.235***	-0.124***	-0.234***
	(-37.15)	(-22.35)	(-22.71)	(-10.35)	(-1.91)	(-12.77)	(-12.79)	(-27.00)	(-49.68)
Industry Sigma	0.109***	0.106***	0.176	-0.037	-0.203**	0.109	0.109	0.036	0.191***
	(2.94)	(2.77)	(1.13)	(-1.32)	(-2.48)	(1.36)	(1.32)	(1.34)	(5.68)
RD/Sale	-0.150***	-0.047	-0.630***	-0.063**	-0.483***	-0.150***	-0.150***	-0.090***	-0.160***
	(-3.59)	(-1.10)	(-2.64)	(-2.17)	(-5.98)	(-3.53)	(-3.60)	(-3.35)	(-8.83)
DIV_DUM	0.002	0.005**	-0.012*	0.010***	0.003	0.002	0.002	0.008***	0.003*
	(1.36)	(2.51)	(-1.85)	(7.91)	(0.65)	(1.10)	(0.67)	(6.76)	(1.87)
ACQ	-0.223***	-0.144***	-0.662***	-0.422***	-0.069*	-0.223***	-0.223***	-0.322***	-0.246***
	(-16.36)	(-10.67)	(-11.78)	(-23.82)	(-1.89)	(-5.22)	(-5.28)	(-22.50)	(-32.10)
GDP_PC	0.000***	0.000***	0.000***	-0.000***	-0.000*	0.000*	0.000*	-0.000	0.000***
	(4.69)	(3.15)	(3.37)	(-7.36)	(-1.77)	(1.74)	(1.78)	(-0.57)	(9.99)
Lag Cash								0.537***	
								(92.38)	
Constant	0.245***	0.236***	0.602***	0.040***	0.242***	0.245***	0.245***	0.113***	0.162***
	(15.44)	(13.50)	(12.14)	(4.72)	(4.46)	(7.13)	(6.96)	(11.60)	(10.28)
Observations	138,541	114,620	138,539	115,383	16,789	138,541	138,541	115,383	233,217
R-squared	0.7509	0.7706	0.6917	0.1738	0.2419	0.7509	0.7509	0.8523	0.7683
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the coefficient estimates of regressing cash, defined as the ratio of cash and marketable securities over total assets, on economic policy uncertainty and a set of control variables that are based on Bates et al. (2009). The definitions of the control variables can be found in Table A1 in the Appendix. Standard errors are clustered by firm except for columns 6 and 7 in which we cluster by country and country and year, respectively. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 4: Some Robustness Tests

VARIABLES	(1) EPU_{resid}	(2) EPU_{resid} & another macro factors	(3) EPU & Other Macro Factors	(4) without Japan	(5) without China	(6) without Canada
EPU_{resid}	-0.007***	-0.009***				
	(-7.37)	(-7.79)				
EPU			-0.009***	-0.004**	-0.011***	-0.004***
			(-5.02)	(-2.27)	(-5.47)	(-2.58)
MB	0.007***	0.004***	0.004***	0.008***	0.011***	0.004***
	(10.19)	(6.31)	(6.37)	(10.98)	(12.71)	(5.44)
Size	-0.007***	-0.006***	-0.006***	-0.007***	-0.008***	-0.000
	(-4.87)	(-3.75)	(-3.94)	(-3.78)	(-4.61)	(-0.25)
Cash Flow	-0.045***	-0.023**	-0.023**	-0.048***	-0.062***	-0.010
	(-5.19)	(-2.45)	(-2.40)	(-5.27)	(-6.62)	(-1.01)
NWC	-0.182***	-0.196***	-0.196***	-0.155***	-0.203***	-0.209***
	(-29.18)	(-30.89)	(-30.81)	(-21.40)	(-28.18)	(-32.34)
CAPEX	-0.140***	-0.163***	-0.165***	-0.151***	-0.147***	-0.130***
	(-10.50)	(-11.00)	(-11.12)	(-11.21)	(-11.03)	(-8.41)
Leverage	-0.235***	-0.243***	-0.244***	-0.246***	-0.217***	-0.240***
	(-37.10)	(-38.80)	(-38.85)	(-32.43)	(-31.08)	(-36.19)
Industry Sigma	0.109***	0.100***	0.103***	0.023	0.149***	0.195***
	(2.93)	(2.83)	(2.92)	(0.61)	(3.50)	(4.79)
RD/Sale	-0.149***	-0.180***	-0.183***	-0.135***	-0.130***	-0.203***
	(-3.57)	(-4.28)	(-4.34)	(-2.90)	(-3.06)	(-4.96)
DIV_DUM	0.003*	-0.000	-0.002	0.003	0.000	-0.001
	(1.79)	(-0.20)	(-0.87)	(1.40)	(0.11)	(-0.73)
ACQ	-0.222***	-0.242***	-0.243***	-0.224***	-0.189***	-0.264***
	(-16.29)	(-15.87)	(-15.94)	(-16.64)	(-14.15)	(-14.85)
GDP_PC	0.000***	0.000	0.000	-0.010*	0.001	-0.041***
	(4.09)	(0.97)	(1.34)	(-1.85)	(0.11)	(-9.08)
GDP growth		0.000	0.000*			
		(1.55)	(1.86)			
Stock Market_cap		-0.000	0.000			
		(-0.07)	(0.21)			
PrivateCredit_GDP		-0.005	-0.006			
		(-1.36)	(-1.53)			
Creditor Rights		0.022***	0.024***			
		(7.68)	(8.32)			
Voice & Accountability		0.046***	0.043***			
		(6.79)	(6.31)			
Corruption		-0.021***	-0.018***			
		(-4.90)	(-4.16)			
Rule of Law		0.004	0.001			
		(0.66)	(0.17)			
Gov Effectiveness		0.008*	0.008**			
		(1.87)	(2.00)			
Political Stability		-0.001	-0.001			
		(-0.20)	(-0.24)			
Regulatory Quality		-0.014***	-0.011***			
		(-4.13)	(-3.27)			
Constant	0.193***	0.146***	0.183***	0.350***	0.281***	0.644***
	(13.71)	(9.40)	(10.68)	(7.05)	(3.05)	(15.18)
Observations	138,541	121,327	121,327	86,925	116,327	122,216
R-squared	0.7509	0.7696	0.7695	0.7381	0.7665	0.7593

Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the coefficient estimates of regressing cash, defined as the ratio of cash and marketable securities over total assets, on economic policy uncertainty and a set of control variables that are based on Bates et al. (2009). EPU_{resid} is the residuals of regressing EPU of each country on the EPU of the U.S. In Columns 4, 5, and 6 we report the result of our base model when we exclude Japanese, Chinese, and Canadian firms which represent 36%, 16%, and 12% of sample. The definitions of the control variables can be found in Table A.1 in the Appendix. All models include firm, and year fixed effects and standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 5: Where is cash going?

	Panel A: Cash flow statement					
VARIABLES	(1) **CF from Operating**	(2) **CF from Investing**	(3) **CF from Financing**	(4) **CF from Operating**	(5) **CF from Investing**	(6) **CF from Financing**
EPU	-0.001	0.024***	-0.047***	0.001	0.008	-0.032***
	(-0.11)	(4.14)	(-6.30)	(0.30)	(1.61)	(-4.53)
MB				-0.011***	-0.007***	0.041***
				(-6.97)	(-6.13)	(15.24)
Size				0.013***	-0.008***	-0.012***
				(4.79)	(-3.38)	(-2.85)
Cash Flow				0.513***	-0.089***	-0.193***
				(23.49)	(-8.28)	(-9.54)
NWC				-0.123***	-0.027**	0.076***
				(-6.83)	(-1.98)	(3.43)
CAPEX				0.111***	-0.921***	0.542***
				(5.27)	(-51.20)	(16.09)
Leverage				-0.093***	-0.043***	0.109***
				(-5.92)	(-3.80)	(5.62)
Industry Sigma				-0.193***	0.113*	-0.126
				(-2.99)	(1.90)	(-1.25)
RD/Sale				-0.596***	0.221***	-0.105
				(-8.98)	(4.55)	(-1.11)
DIV_DUM				0.035***	-0.004	-0.028***
				(7.59)	(-1.04)	(-4.37)
ACQ				-0.060***	-1.160***	1.149***
				(-2.86)	(-45.24)	(26.52)
GDP_PC	0.033*	-0.046***	0.036	0.040***	-0.014	0.007
	(1.75)	(-2.83)	(1.39)	(2.63)	(-0.87)	(0.35)
Constant	-0.350*	0.267	-0.058	-0.432***	0.144	0.097
	(-1.75)	(1.53)	(-0.21)	(-2.67)	(0.83)	(0.44)
Observations	16,903	16,941	16,940	16,789	16,827	16,826
R-squared	0.7120	0.3671	0.5284	0.8399	0.5817	0.6281
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

	Panel B: Uses of cash				
	(1)		(2)		(3)
VARIABLES	**Leverage**		**CAPEX**		**Payout ratio**
EPU	0.004**	EPU	-0.017***	EPU	0.124***
	(2.27)		(-16.84)		(14.34)
MB	-0.000	TobinQ	0.002***	SGR	-0.046***
	(-0.10)		(10.83)		(-12.10)
Median_Ind_Lev	0.572***	CF_Lag_At	0.001	RE	0.027***
	(64.75)		(1.03)		(4.22)
Profitability	-0.215***	SGR	0.020***	TE	0.233***
	(-21.79)		(21.11)		(9.54)
Mature	0.010***	GDP PC	0.008***	ROA	-0.793***
	(7.10)		(8.33)		(-18.32)
Tangibility	0.141***	Constant	0.014*	cash	-0.126***
	(18.89)		(1.89)		(-4.53)
Size	0.036***			Size	0.066***
	(22.79)				(9.76)
Inflation	0.000			GDP PC	-0.177***
	(0.97)				(-10.75)
GDP PC	0.010**			Constant	1.126***
	(2.03)				(7.02)
Constant	-0.275***				
	(-5.55)				
Observations	140,282		113,492		115,104
R-squared	0.8241		0.7635		0.3275
Year FE	Yes		Yes		Yes
Firm FE	Yes		Yes		Yes

This table explores the possible channels to explain the decrease in cash holding. In Panel A, we use the cash flow statement and explore the effect of policy uncertainty on cash flow from operating, investing, and financing activities. In Panel B, we explore the uses of cash. In the first model leverage is dependent variable and the regression is based on Frank and Goyal (2009). The second column is based on Gulen and Ion (2016) where Capex is regressed on EPU and other control variables. The third model is based on Brockman and Unlu (2009) And Attig et al. (2021) where dividend payout ratio is the dependent variable. The definitions of all the variables can be found in Table A.1 in the Appendix. All models include firm, and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 6: EPU, cash, dividend, and firm value

	(1)	(2)	(3)	(4)	(5)	(6)
EPU	-0.248***	-0.259***	-0.449***	-0.248***	-0.247***	-0.462***
	(-13.33)	(-13.82)	(-14.16)	(-13.33)	(-12.83)	(-14.09)
Cash_orth*EPU		-0.618***				-0.617***
		(-5.73)				(-5.60)
Div_dum*EPU			0.242***			0.242***
			(7.77)			(7.73)
Leverage_orth*EPU				0.055		0.152
				(0.60)		(1.62)
Capex_orth*EPU					-0.039	0.108
					(-0.19)	(0.53)
Cash_orth	-1.354***	1.569***	-1.344***	-1.353***	-1.354***	1.576***
	(-17.66)	(3.07)	(-17.50)	(-17.62)	(-17.64)	(3.02)
Leverage_orth	0.356***	0.353***	0.350***	0.096	0.356***	-0.369
	(4.66)	(4.62)	(4.58)	(0.22)	(4.66)	(-0.82)
CAPEX_orth	-1.732***	-1.733***	-1.695***	-1.732***	-1.556*	-2.188**
	(-9.44)	(-9.47)	(-9.27)	(-9.44)	(-1.66)	(-2.31)
Size	-0.337***	-0.336***	-0.341***	-0.337***	-0.337***	-0.341***
	(-15.96)	(-15.96)	(-16.17)	(-15.95)	(-15.96)	(-16.17)
DIV_DUM	0.129***	0.128***	-1.029***	0.129***	0.129***	-1.030***
	(6.83)	(6.74)	(-6.76)	(6.82)	(6.84)	(-6.74)
Cash Flow	0.308**	0.306**	0.324**	0.308**	0.309**	0.321**
	(2.04)	(2.02)	(2.13)	(2.04)	(2.04)	(2.10)
GDP_PC	0.969***	0.977***	1.014***	0.969***	0.968***	1.023***
	(18.98)	(19.07)	(20.02)	(18.99)	(18.98)	(20.10)
Constant	-5.157***	-5.186***	-4.621***	-5.154***	-5.156***	-4.643***
	(-11.76)	(-11.81)	(-10.09)	(-11.77)	(-11.76)	(-10.17)
Observations	112,874	112,874	112,874	112,874	112,874	112,874
R-squared	0.7095	0.7099	0.7102	0.7095	0.7095	0.7106
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the coefficient estimates of the marginal effect on firm value of corporate responses to policy uncertainty. Dependent variable is Tobin's Q. The definitions of all variables can be found in Table A1 in the Appendix. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 7: Instrumental variable estimation

	Panel A: Cash Holding	
	First Stage	**Second Stage**
FRAC	0.397***	
	(12.67)	
Instrumented EPU		-0.109***
		(-3.49)
MB	-0.014***	0.007***
	(-11.32)	(8.05)
Size	-0.007**	-0.002
	(-2.24)	(-0.97)
Cash Flow	-0.002	-0.033***
	(-0.13)	(-3.38)
NWC	-0.091***	-0.196***
	(-8.87)	(-25.49)
CAPEX	-0.366***	-0.211***
	(-12.01)	(-11.18)
Leverage	-0.024*	-0.216***
	(-1.9)	(-30.27)
Industry Sigma	-0.008	0.088**
	(-0.1)	(2.18)
RD/Sale	-0.125**	-0.109**
	(-2.33)	(-2.25)
DIV_DUM	-0.033***	0.014***
	(-9.77)	(5.77)
ACQ	0.072**	-0.180***
	(1.97)	(-12.13)
Observations	105,346	105,346
Year FE	Yes	Yes
Firm FE	Yes	Yes
Underidentification Test: Kleibergen-Paap rk LM Statistic	152.18***	
Weak Identification Test: Kleibergen-Paap rk F Statistic	160.51	
Weak Identification Test: Cragg-Donald Wald F Statistic	648.046***	
Weak-Instrument-Robust Inference: Anderson-Rubin Wald Test	12.92***	

This table reports the results of the IV regression. It reports the two stage least square results for cash holdings. Regression model is based on Bates et al. (2009). FRAC is political fractionalization and is obtained from the Database of Political Institution. Varying from 0 to 1, this measure tracks the probability that two deputies picked at random from the legislature will be of different parties. The definitions of other control variables can be found in Table A.1 in the Appendix. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 8: Simultaneous Equations

Panel A: Simultaneous equations for cash and dividend

(1) Cash Eq.		(2) Dividend Eq.	
EPU	-0.004***	EPU	0.135***
	(-2.60)		(18.21)
MB	0.014***	SGR	-0.073***
	(43.28)		(-17.75)
Size	-0.007***	RE	0.058***
	(-30.54)		(16.24)
Cash Flow	-0.067***	TE	-0.001
	(-15.87)		(-0.11)
NWC	-0.164***	ROA	-0.236***
	(-71.14)		(-11.23)
CAPEX	-0.235***	cash	0.088***
	(-28.32)		(2.61)
LEV	-0.334***	size	0.012***
	(-151.78)		(10.81)
industry_sigma	0.459***	GDP PC	-0.097***
	(23.39)		(-7.73)
RD	0.373***	Constant	1.202***
	(35.11)		(9.07)
DIV_DUM	0.009***		
	(7.52)		
ACQ	-0.269***		
	(-18.77)		
GDP PC	0.009***		
	(3.48)		
Constant	0.130***		
	(4.80)		
Observations	115,182		115,182
R-squared	0.3469		0.0854
Year FE	Yes		Yes
Country FE	Yes		Yes
Industry FE	Yes		Yes

Panel B: Simultaneous equations for cash, dividend, leverage, and investment

(1) Cash Eq.		(2) Dividend Eq.		(3) Leverage Eq.		(4) Capex Eq.	
EPU	-0.004**	EPU	0.130***	EPU	-0.005***	EPU	-0.018***
	(-2.21)		(16.51)		(-2.83)		(-30.54)
MB	0.010***	RE	0.060***	MB	-0.001*	TobinQ	0.001***
	(30.40)		(15.51)		(-1.79)		(9.82)
size	-0.003***	TE	-0.014	size	0.011***	CF_lag_at	0.003***
	(-13.67)		(-1.20)		(40.09)		(10.50)
Cash Flow	-0.116***	ROA	-0.212***	median_ind_lev	0.763***	SGR	0.027***
	(-24.05)		(-8.97)		(220.16)		(41.90)
NWC	-0.240***	SGR	-0.197***	profitability	-0.256***	GDP PC	0.012***
	(-92.62)		(-22.05)		(-57.66)		(12.55)
CAPEX	-0.236***	cash	0.075***	mature	-0.002	Constant	-0.001
	(-24.63)		(2.94)		(-1.47)		(-0.09)
LEV	-0.557***	size	0.010***	tangibility	0.138***		
	(-177.59)		(8.50)		(59.04)		
industry_sigma	0.303***	GDP PC	-0.111***	Inflation	0.001***		
	(13.98)		(-8.41)		(2.80)		
RD	0.295***	Constant	1.480***	GDP PC	-0.004		
	(24.90)		(10.63)		(-1.47)		
DIV_DUM	0.000			Constant	0.039		
	(0.32)				(1.19)		
ACQ	-0.202***						
	(-12.78)						
GDP PC	-0.000						
	(-0.08)						
Constant	0.292***						
	(9.94)						
Observations	104,768		104,768		104,768		104,768
R-squared	0.2979		0.0890		0.4483		0.4559
Year FE	Yes		Yes		Yes		Yes
Country FE	Yes		Yes		Yes		Yes
Industry FE	Yes		Yes		Yes		Yes

This table reports the results of the second stage of estimating a system of simultaneous equations. Panel A includes cash and dividend equations whereas panel B includes leverage and investment equations as well. Cash, dividend, leverage, and investment equations are based on Bates et al. (2009), Brockman and Unlu (2009), Frank and Goyal (2009), and Gulen and Ion (2016), respectively. The definitions of the control variables can be found in Table A.1 in the Appendix. The coefficients on other control variables are not reported for brevity. All specifications include year, industry, and country fixed effects. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 9: Country Characteristics

VARIABLES	(1) Emerging	(2) BRIC	(3) Corruption	(4) Poor governance	(5) Common law
EPU*emerging	0.004*				
	(1.71)				
EPU*BRIC		0.005**			
		(2.43)			
EPU*corrupt			0.006***		
			(4.66)		
EPU*Poor Gov.				0.003**	
				(2.25)	
EPU*Common Law					-0.013***
					(-5.95)
EPU	-0.014***	-0.015***	-0.010***	-0.013***	-0.003*
	(-6.65)	(-7.19)	(-5.00)	(-6.43)	(-1.68)
MB	0.007***	0.007***	0.007***	0.007***	0.007***
	(10.16)	(10.14)	(11.05)	(9.96)	(10.33)
Size	-0.007***	-0.008***	-0.006***	-0.009***	-0.007***
	(-5.02)	(-5.09)	(-3.61)	(-5.78)	(-4.59)
Cash Flow	-0.045***	-0.044***	-0.047***	-0.044***	-0.046***
	(-5.14)	(-5.12)	(-5.36)	(-5.07)	(-5.27)
NWC	-0.183***	-0.183***	-0.183***	-0.179***	-0.183***
	(-29.25)	(-29.24)	(-28.90)	(-28.38)	(-29.36)
CAPEX	-0.145***	-0.145***	-0.143***	-0.145***	-0.152***
	(-10.87)	(-10.89)	(-10.01)	(-10.15)	(-11.37)
Leverage	-0.235***	-0.234***	-0.243***	-0.239***	-0.234***
	(-37.06)	(-37.07)	(-37.61)	(-37.16)	(-37.03)
Industry Sigma	0.108***	0.107***	0.100***	0.081**	0.109***
	(2.91)	(2.88)	(2.74)	(2.25)	(2.91)
RD/Sale	-0.151***	-0.151***	-0.153***	-0.162***	-0.154***
	(-3.61)	(-3.62)	(-3.71)	(-3.92)	(-3.68)
DIV_DUM	0.002	0.003	-0.000	0.002	0.003
	(1.38)	(1.39)	(-0.17)	(1.26)	(1.52)
ACQ	-0.223***	-0.223***	-0.223***	-0.224***	-0.225***
	(-16.39)	(-16.40)	(-15.85)	(-15.95)	(-16.58)
GDP_PC	0.000***	0.000***	-0.036***	0.000***	0.001***
	(4.61)	(4.73)	(-8.10)	(3.81)	(3.58)
Constant	0.250***	0.251***	0.641***	0.266***	0.277***
	(15.01)	(15.29)	(15.02)	(16.65)	(24.76)
Observations	138,541	138,541	130,426	130,426	138,541
R-squared	0.7510	0.7510	0.7581	0.7576	0.7509
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

This table reports the results of subsample analysis. In Models (1) and (2), we examine the effect of EPU on cash holdings among firms in emerging economies and BRIC countries, respectively. We determine emerging economies based on MSCI classification. In Model (3) we examine the effect of EPU among firms in countries with weak control on corruption that is based on Kaufmann et al. (2010). Model (4) presents the results for the examination of how the effect of EPU on cash holdings is moderated by the overall corporate governance of a country that is based on Kaufmann et al. (2010). Finally, Model (5) presents the results of the examination of the effect of EPU on cash holdings for firms in Common Law countries. We follow LaPorta et al. (1998) to split the sample into countries with and without common law legal origin. The definitions of all the variables can be found in Table A.1 in the Appendix. All models include firm and year fixed effects and standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 10: Line of credit

VARIABLES	(1) Hasline	(2) Increase in LOC	(3) Increase in LOC	(4) Unused LOC/at	(5) Unused LOC/na	(6) Unused LOC /Liq
EPU	0.143***	-0.002	0.014***	0.013***	0.015***	0.048***
	(24.12)	(-0.41)	(3.00)	(15.28)	(15.11)	(14.20)
EBITDA/na	-0.018**	0.007*	-0.007**	0.001	0.001**	-0.011***
	(-2.55)	(1.77)	(-2.51)	(0.94)	(2.05)	(-4.93)
Tangible asset	0.052***	0.004	0.017***	-0.004**	-0.004**	-0.015**
	(3.00)	(0.38)	(2.89)	(-2.47)	(-2.42)	(-2.30)
Size	0.054***	-0.010***	-0.013***	0.002***	0.002***	0.020***
	(14.29)	(-5.11)	(-15.05)	(4.83)	(3.63)	(11.73)
Net Worth	-0.051***	0.009*	0.014***	-0.001	-0.002*	-0.001
	(-5.80)	(1.87)	(3.65)	(-0.84)	(-1.74)	(-0.33)
MB	-0.001	-0.001**	0.000	0.000***	0.000***	0.001***
	(-1.43)	(-2.45)	(0.45)	(6.22)	(5.82)	(6.56)
Sales Vol.	0.195***	-0.077***	-0.130***	0.018***	0.021***	0.052***
	(4.78)	(-2.89)	(-6.95)	(3.88)	(4.01)	(2.77)
Cash Flow Vol.	-0.044	-0.037	0.354***	0.052***	0.056***	0.249***
	(-0.35)	(-0.47)	(6.58)	(3.72)	(3.58)	(4.32)
Age	0.021***	0.004	-0.008***	-0.001	-0.001	-0.001
	(3.41)	(0.89)	(-4.93)	(-1.10)	(-0.93)	(-0.65)
GDP growth	-0.202***	0.202***	0.173***	-0.008***	-0.008***	-0.036***
	(-15.63)	(30.05)	(29.96)	(-7.67)	(-7.14)	(-8.62)
Constant	1.299***	-1.040***	-0.797***	0.011	0.010	0.062*
	(10.16)	(-14.66)	(-13.11)	(1.41)	(1.14)	(1.91)
Observations	132,216	132,216	132,509	132,216	132,216	130,414
R-squared	0.5817	0.3184	0.1234	0.5990	0.5976	0.6407
Firm FE	Yes	Yes	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	No	No	No
Industry FE	No	No	Yes	No	No	No

This table reports the results of regressing different measures of lines of credit on EPU and a set of other control variables constructed based on Sufi (2009). In the first column, the dependent variable is an indicator that is equal to 1 if a firm has a line of credit and 0 otherwise. In the second column, the dependent variable is equal to 1 if a firm's line of credit has increased from previous year and 0 otherwise. The third column is similar to the second except for the fixed effects used. In the last three columns, the dependent variables are unused lines of credit scaled by total assets, net assets, and total liquidity in Columns 3, 4 and 5, respectively. The definitions of all the variables can be found in Table A.1 in the Appendix. All standard errors are clustered by firm. *t*-statistics are reported in parentheses. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.