

Economic Policy Uncertainty, Institutional Environments, and Corporate Cash Holdings

Abstract

We investigate the effect of economic policy uncertainty (EPU) on corporate cash holdings using a large sample of international firms. EPU intensifies concerns of investors on managerial self-dealing and political extraction. Consequently, the potential cost of cash holdings (i.e., expropriation) outweighs its benefit (i.e., precautionary motives), and the optimal amount of cash holdings decreases. We find supportive evidence that firms hold less cash when EPU is high. We further show that the market discounts excess cash holdings under high policy uncertainty, but this negative effect is mitigated by stronger investor protection, better freedom of press, and better government quality.

JEL classification: D80, E66, G18, G32, G34, G35

Keywords: Policy uncertainty; Cash holdings; Investor protection; Press freedom; Government quality

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1. Introduction

How the political and regulatory environment affect corporate decisions has long been a subject of interest, especially in the aftermath of the 2008 financial crisis, which has increased scrutiny of firms (Bates, Kahle, and Stulz, 2009). Policy uncertainty in major economies has raised concerns for the capital markets and global financial conditions (IMF, 2018). Prior literature investigating the relation between economic policy uncertainty and corporate policies primarily relies on cross-sectional or single-country political events such as elections, corruption convictions, or politician downfalls (e.g., Smith, 2016; Xu, Chen, Xu, and Chan, 2016). Surprisingly, we know little about what drives time-series variations in corporate cash policies and how such policies respond to changes and uncertainty in the macroeconomic environment induced by the political system. This issue is of importance because economic policy uncertainty can be disruptive for firms (Gulen and Ion, 2016; Bonaime, Gulen, and Ion, 2018; Guedhami, Mansi, Reeb, and Yasuda, 2021), depresses economic growth, and increases bank liquidity hoarding and financing costs (Berger, Guedhami, Kim, and Li, 2022; Waisman, Ye, and Zhu, 2015), making corporate liquidity management particularly salient during high policy uncertainty periods.

We extend the literature by examining the effect of economic policy uncertainty (EPU hereafter) on firms' cash holdings using a sample of international firms. Specifically, we investigate the effect of EPU, as measured and updated based on the index of Baker, Bloom, and Davis (2016) for a sample of 19 countries, on firms' cash reserves and the value of cash holdings. The emphasis of our study is distinct from prior research on cash holdings that focuses mainly on the role of firm-level decisions and in a single-country setting.¹ Graham and Leary (2018) suggest that while firm characteristics can help explain cross-sectional patterns in firms' cash reserves, macroeconomic variables such as productivity and GDP growth can improve a model's ability to capture time-series variations in cash reserves. Our study captures the effect of policy uncertainty

¹ Prior research has examined the relation between cash holdings and a firm's organizational structure (Subramaniam, Tang, Yue, and Zhou, 2011), bank lines of credit (Campello, Giambona, Graham, and Harvey, 2011), corporate diversification (Duchin, 2010), financial constraints (Denis and Sibilkov, 2010), CEO's prior professional experience (Dittmar and Duchin, 2016), technology spillovers (Qiu and Wan, 2015), firm internationalization (Gu, 2017), and corporate governance (Dittmar, Mahrt-Smith, and Servaes, 2003; Pinkowitz, Stulz, and Williamson, 2006; Harford et al., 2008; Harford, Kecskés, and Mansi, 2012). Studies examining the effect of country-level institutional factors (e.g., Kalcheva and Lins, 2007; Chen, El Ghouli, Guedhami, and Nash, 2018) are an exception.

driven by events such as the 2003 Iraq war, the 2008–2011 European debt crisis, the 2016 Brexit referendum, and major political elections on firms' liquidity.

We begin our analysis by examining how EPU might affect the firms' cash holdings. The literature provides two main explanations with mixed results. First, firms may increase cash holdings in high EPU periods for precautionary motives. This is because policy uncertainty intensifies financial frictions (Drobotz, El Ghouli, Guedhami, and Janzen, 2018) and thus leads to an increase in the costs of external financing. The implication is that firms may scale back on investments and on spending cash reserves. Relatedly, given the irreversibility of certain investments, Gulen and Ion (2016) argue that policy uncertainty increases the value of the option to wait and postpone investment.

Second, policy uncertainty may intensify concerns of investors about managerial self-dealing and political extraction. Jensen (1986) posits that self-interested managers have incentives to spend available cash inefficiently rather than paying it out to shareholders. Therefore, managerial opportunism may be more pronounced during high EPU periods because profitable investment opportunities decline with increased uncertainty (Harford, 1999; Harford, Mansi, and Maxwell, 2008). In the presence of conflicts of interest with shareholders during increased EPU periods, managers may have incentives to accumulate cash for private benefits and to avoid external financing. As such, investors are likely to pressure managers to distribute cash holdings into dividend payouts to accommodate the increased need for monitoring (Attig, El Ghouli, Guedhami, and Zheng, 2021; Abreu and Gulamhussen, 2013; Faccio, Lang, and Young, 2001). Boubakri, Guedhami, and Mishra (2010) show that investors were aware of the risk of managerial entrenchment following the Asian financial crisis and required a higher equity premium. Attig et al. (2021) find that during high-EPU periods, firms tend to pay higher dividends to address the agency problems of free cash flows. Moreover, firms facing high policy uncertainty may choose to shelter liquid assets to deter rent-seeking (Klasa, Maxwell, and Ortiz-Molina, 2009; Matsa, 2010; Caprio, Faccio, and McConnell, 2011). Therefore, whether the potential cost of cash holdings (i.e., managerial entrenchment and political extraction) outweighs its benefit (i.e., precautionary motives) it is an open empirical question.

Using a large sample of 73,828 firm-year observations from 19 countries covering the period from 1988–2016, we find strong and robust evidence that EPU is negatively associated with

corporate cash holdings. The results are consistent with the view that investors prefer less cash holdings because they are more concerned about managerial discretion and potential government expropriation when policy uncertainty is high. Economically, moving the EPU from the 25th percentile to the 75th percentile results in an 11.6% decrease in corporate cash holdings. Our results are robust to controlling for lagged cash holdings, using an alternative econometric model, accounting for investment opportunity, financial market development, informal institutions, alternative sources of uncertainty, and using Compustat Quarterly data.

We use two methods to address the potential endogeneity issue that EPU and corporate cash holdings can be simultaneously determined by omitted variables. We first use the global EPU index from Baker et al. (2016) to proxy country-specific policy uncertainty. Global EPU is unlikely to be affected by a country-specific event that could potentially determine both country-specific uncertainty and corporate cash holdings. We also implement a two-stage instrumental variable regression analysis. We use political polarization and years left in the current term, obtained from Database of Political Institutions, as our instruments. In the first-stage regression, we find that polarization is positively and years left in the current term is negatively associated with EPU. In the second stage, the instrumented EPU variable is negatively and statistically associated with corporate cash holdings.

Next, we investigate whether country-level institutions affect the value of cash holdings. We find that as EPU increases, market participants discount the value of cash holdings in countries with poor investor protection, lower freedom of press, and poorer government quality. Overall, the results suggest that investors are likely to discount the value of cash holdings severely when country-level institutions are less effective at constraining government expropriation.

We contribute to the existing literature by adding to a growing body of research that provides evidence on the effect of EPU on the equity risk premium (Brogaard and Detzel, 2015), capital investment (Gulen and Ion, 2016; Jens, 2017), technological innovation (Bhattacharya, Hsu, Tian, and Xu, 2017, Van Vo and Le, 2017), bank liquidity hoarding (Berger et al., 2022), dividend policy (Attig, El Ghouli, Guedhami, and Zheng, 2021; Farooq and Ahmed, 2019), information asymmetry (Nagar, Schoenfeld, and Wellman, 2019), earnings quality (El Ghouli, Guedhami, Kim, and Yoon, 2021), the sensitivity of investment to the cost of capital (Drobetz, El Ghouli, Guedhami, and Janzen, 2018), M&A activity at the firm and macro levels (Nguyen and Phan, 2017; Bonaime et

al., 2018), insider trading (El Ghouli, Guedhami, Nash, and Wang, 2022), and IPO activity (Colak, Durnev, and Qian, 2017). However, further work is needed to deepen our understanding of time-series variations in corporate cash holdings. For example, additional work could shed light on how firms manage their liquidity needs in response to a time-varying liquidity premium or how they use cash substitutes to smooth out volatility in corporate policies. More broadly, our evidence on the effect of policy uncertainty on the stockpiling of cash reserves and their valuation effect is relevant and timely given recent tax reforms in the U.S. and their anticipated implications for corporate cash reserves. Our paper is related to Goodell, Goyal, and Urquhart (2021), who find that greater volatility of economic uncertainty is positively associated with corporate cash holdings. However, their paper primarily focuses on how uncertainty of policy uncertainty influences corporate cash policies, while our paper investigates how policy uncertainty *per se* affects cash holdings. Our paper is also related to Phan, Nguyen, Nguyen, and Hegde (2019), who find that firms facing higher uncertainty tend to hold more cash, consistent with the precautionary motives. Their study employs a U.S. sample while ours uses an international sample from 19 countries. Investor protection and corporate governance are strong in the U.S. and have less variation than in other countries (Harford, Mansi, and Maxwell, 2008). Therefore, U.S. firms are less likely to be affected by managerial self-dealing and political extraction.

The remainder of this study is organized as follows. In section 2, we discuss related literature and develop our hypotheses. Section 3 describes our sample construction and variables. In section 4, we report the results of our empirical analysis. Section 5 concludes.

2. Related Literature and Hypotheses Development

2.1. Cash Holdings

Prior literature has examined the determinants of corporate cash holdings. According to the trade-off theory, a firm should accumulate more cash as long as the incremental benefits of cash holdings exceed the cost-of-carry—the opportunity cost of an additional dollar of cash holding (Opler, Pinkowitz, Stulz, and Williamson, 1999). The benefits of holding cash arise when information asymmetries between firms and external investors make it costly for firms to obtain external funds (Myers and Majluf, 1984). Firms increase their cash balances or liquidate assets to

reduce the transaction costs of raising funds to meet cash needs or preserve their ability to invest in new opportunities (Opler et al., 1999).

In line with the precautionary motive for holding cash, empirical evidence shows that firms with easy access to the capital market tend to hold less cash (Opler et al., 1999).² Firms tend to accumulate more cash as a result of uncertain regulatory climates (Pinkowitz, Sturgess, and Williamson, 2013), an increase in the riskiness of cash flows (Bates et al., 2009), or during times of heightened volatility (Acharya, Almeida, and Campello, 2013). Lins, Servaes, and Tufano (2010) similarly find that chief financial officers use non-operational excess cash to hedge against future cash flow shocks during bad times.³

The agency explanation of cash holdings suggests that cash may lead self-interested managers to engage in overinvestment or private consumption. In firms with poor investment opportunities, entrenched managers accumulate cash rather than increase payouts to shareholders (Jensen, 1986). Managers have incentives to retain excess cash flow to avoid external monitoring by capital markets or to consume private benefits using liquid assets. Prior studies provide mixed evidence on the role of agency problems on corporate cash holdings. Mikkelsen and Partch (2003) find that firms with large cash reserves perform better than their matched counterparts, and are associated with greater investment and growth in assets. They consequently conclude that cash holdings do not serve the interests of managers rather than the interests of shareholders.

Several studies find supporting evidence for the agency explanation of cash holdings. For instance, Harford (1999) shows that cash-rich firms are positively associated with value-decreasing acquisitions. Dittmar and Mahrt-Smith (2007) show that the value of cash is lower in poorly governed firms. Harford et al. (2008) show that firms with weak corporate governance, proxied by low shareholder rights, hold less cash. . A few studies use cross-country samples to examine the role of country-level governance on corporate cash holdings. Dittmar et al. (2003) find that firms have higher cash holdings in countries with poor shareholder protection. Chen, Guedhami, Yang, and Zaynutdinova (2020) find that improvements in corporate governance

² In particular, financially constrained firms (Almeida, Campello, and Weisbach, 2004), as well as smaller and younger firms (Brown and Petersen, 2011), tend to hold more cash.

³ Evidence shows that firms issue shares when market conditions are favorable (McLean, 2011), that diversified firms hold less cash than their standalone counterparts (Duchin, 2010), and that there is a positive correlation between cash and credit risk spreads (Acharya et al., 2013). This would also support the precautionary motives of cash holdings.

following board reforms yield significant reductions in cash holdings. Similarly, Pinkowitz et al. (2006) find that the value of cash holdings is less in countries with poor investor protection. Kalcheva and Lins (2007) examine the interaction between country-level and firm-level governance and find that in the presence of weak shareholder protection, firms' valuation is lower when entrenched managers have higher cash holdings.

In the following sections, we describe the extant literature that focuses on how EPU may affect cash holdings. We then present our main hypothesis.

2.2. EPU and Corporate Cash Holdings

2.2.1. EPU, Precautionary Motives, and Corporate Cash Holdings

Policy-driven uncertainty increases precautionary demand for cash holdings (Keynes, 1936) leading to cash accumulation in periods of uncertainty. In this context, policy-driven uncertainty adversely affects financial frictions, causing deterioration in business conditions and an increase in the costs of external financing. The implication is that firms may scale back on investments and on spending cash reserves. Relatedly and given the irreversibility of certain investments, policy uncertainty increases the value of the option to wait and postpone investment (Gulen and Ion, 2016). Firms may also avoid mergers and acquisitions (Bonaime et al., 2018; Nguyen and Phan, 2017). In line with this view, Berger et al. (2022) show that banks hoard liquidity when there is high EPU. Nguyen and Phan (2017) find that policy uncertainty can exacerbate firms' financial constraints and make it difficult to raise external funds to support M&A deals. Using a sample of U.S. firms, Im, Park, and Zhao (2017) find that firms with higher firm-level uncertainty have a higher value of cash holdings. Phan, Nguyen, Nguyen, and Hegde (2019) also find that EPU is positively related to U.S. firms' cash holdings. Demir and Ersan (2017) find similar results in BRIC countries. Overall, the above arguments suggest that firms are likely to accumulate more cash for precautionary motives in response to EPU.

2.2.2 EPU, Increased Need for Monitoring, and Cash Holdings

Policy uncertainty may intensify managerial self-dealing. Managers, in the presence of conflicts of interest with shareholders, may have incentives to accumulate cash for private benefits

or to avoid external financing. With such intensified concern of managerial diversion, investors are likely to impose additional monitoring or even penalties for firms that are more susceptible to agency problems during high-EPU periods. Supporting this view, Boubakri et al. (2010) show that investors were aware of the risk of managerial entrenchment following the Asian financial crisis and required a higher equity premium. Consequently, firms tend to pay dividends to self-discipline and keep active in the capital market for external monitoring (Easterbrook, 1984). Attig et al. (2021) find that during high-EPU periods, firms tend to pay higher dividends to alleviate the agency problems of free cash flows.

2.2.3 EPU, Political Extraction, and Cash Holdings

Firms facing high policy uncertainty may choose to shelter liquidity assets to deter rent-seeking by politicians (Klasa et al., 2009; Matsa, 2010; Caprio et al., 2011). In particular, the expropriation of minority shareholder wealth can be exacerbated during a high-EPU period such as the devaluation of the Russian ruble in 1998 (Johnson, Boone, Breach, and Friedman, 2000). Prior literature suggests that altering financial policies is one channel through which firms could deter rent-seeking. Caprio et al. (2011) argue that political extraction of hard assets is easier to track than extraction of liquid assets. Consistent with this view, Stulz (2005) argues that firms can take actions, such as investing in negative NPV projects, to deter expropriation, particular in a country with a high risk of expropriation. Klasa et al. (2009) provide evidence that firms manage cash balances downward in more unionized industries. Smith (2016) shows that U.S. firms manage liquidity assets downward to limit expropriation by corrupt local officials. Xu et al. (2016) find that when a new government official is appointed, firms hold less cash to mitigate the potential political extraction risk. Taken together, we hypothesize that:

Hypothesis 1a: Policy uncertainty is positively associated with corporate cash holdings.

Hypothesis 1b: Policy uncertainty is negatively associated with corporate cash holdings.

2.2.4 EPU, Country-Level Institutions, and Corporate Cash Holdings

Prior literature explores the roles of shareholder protection and agency problems at the firm level in determining the value of cash. Kalcheva and Lins (2007) and Chen et al. (2018) document

that strong institutions affect the value of corporate cash holdings by mitigating expropriation risk. Therefore, we expect to find that the value of cash holdings varies across countries. Our second hypothesis tests whether the strength of country-level institutions affects the agency conflicts between shareholders and managers, alters incentives of political rent-seeking and thus the value of cash holdings. To the extent that sound institutions reduce agency problems of entrenched managers and alleviate political extraction, including during increased EPU periods (Attig et al., 2021), we expect a positive relation between the strength of country-level institutions and the value of cash holdings. Therefore, our second hypothesis is:

Hypothesis 2. The value of cash holdings under policy uncertainty is higher in countries with a stronger institutional environment.

3. Data and Variable Measurements

3.1 The Sample

We utilize several datasets in our analysis. The data on EPU are from Baker et al. (2016) dataset, accounting data are from Compustat Global, and country-level governance data (used in the valuation of cash specifications) are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008), Hall and Jones (1999), Freedom House, World Governance Indicators (WGI), and International Country Risk Guide (ICRG). We construct our sample using all publicly traded firms in 19 countries with EPU data. We exclude financial and utility firms and drop observations with missing data for our key variables or with missing SIC codes. These filters yield a dataset of 73,828 firm-year observations from 12,607 firms covering 19 countries over the period 1988–2015.

3.2 Measuring Cash Holdings and Economic Policy Uncertainty

We compute cash holdings as the ratio of cash and marketable securities to net assets (Cash Holdings). Because of the skewness in cash holdings variable, we use the natural log of the ratio of cash and marketable securities to net assets as our dependent variable. For robustness, we also compute cash holdings as cash and marketable securities scaled by total sales (Harford et al., 2008) and find statistically similar results.

Our main measure of EPU is the average of the news-based component of the Baker et al. (2016) index in the 12 months of the firm's calendar year (Lagged EPU), scaled by 100. For robustness, we also measure EPU as the concurrent term of the 12-month averaged EPU index (EPU), the lagged natural log of the average of the EPU index over the 12 months (Lagged Ln (EPU)), and the annual standard deviation of the monthly EPU.

3.3 Control Variables

We include several controls in our regressions that are known to affect firm cash holdings. These include firm size, or the natural log of net assets (Size), firm leverage, or the ratio of total debt to total assets (Leverage), the ratio of net working capital to net asset (Net Working Capital/Net Assets), the ratio of cash flow to total assets (Operating Income/Net Assets), annual growth rate in sales (Sales Growth), a dividend dummy that is coded 1 if the firm pays dividend in the current year (Dividend Payer Dummy), the ratio of standard deviation of cash flows to net assets over five years (Cash Flow Volatility), the ratio of capital expenditures to net assets (Capital Expenditures/Net Assets), the ratio of research and development expenditures to net assets (R&D/Net Assets), and the ratio of acquisition expenditures to net assets (Acquisitions/Net Assets). To reduce the influence of outliers, we winsorize all financial variables at the 1st and 99th percentiles. A more comprehensive description of the variables used in the analysis is provided in Appendix A.

3.4 Summary Statistics

Table 1 provides summary statistics of key variables used in the analysis by country. The data show that China and Canada have the largest number of firms and observations in our sample, while South Korea and Ireland have the lowest.⁴ The cash holdings ratio has a mean of about 27%, which ranges from 8.7% for Chilean firms to about 33% for Canadian and Chinese firms.⁵ As for

⁴ Our main results are not driven by the sample distribution. The results remain statistically the same when we sequentially exclude each country from our sample. We also show, in the next session, that excluding both China and Canada from the sample does not statistically affect the results.

⁵ Bates et al. (2009) show that the cash-to-assets ratio for U.S. firms more than doubles from 1980 to 2006. Our sample of 19 countries shows a similar pattern for corporate cash holdings. Indeed, the cash-to-net assets ratio peaks at 35.4% in the year 2010, from 19.3% in 1988. In unreported analysis, we find that our results are not driven by the time trend of corporate cash holdings.

EPU, the United Kingdom on average has the highest value of EPU of about 1.45, reflecting the major economic and political events such as the 2003 Iraq war, the 2008–2011 European debt crisis, and the 2016 Brexit referendum. Sweden has the lowest value of EPU of 0.894, along with Netherlands and Australia which have EPUs of 0.946 and 0.954, respectively. We also report the mean statistics of control variables across countries. As expected, these variables vary significantly between countries due to their diverse institutional environments.

4. Multivariate Analysis

4.1. Evidence on the Relation between EPU and Cash Holdings

We begin by testing the relation between uncertainty related to policy and regulatory shocks and corporate cash holdings while controlling for various firm-specific controls. The dependent variable, Cash Holdings, is the log of the cash-to-net asset ratio. For all our specifications, we use firm (or industry) and year-quarter firm fixed effects to capture unobserved heterogeneity that is constant within firms (or industries) and time periods, respectively. Standard errors are clustered at the firm level to adjust for correlation within a firm.⁶ That is

$$\text{Ln (Cash Holdings)}_{it} = \alpha_i + \alpha_t + \beta_1 \text{EPU}_{it-1} + \beta_{2-11} \text{Firm Specific Controls}_{it} + \varepsilon_{it} \quad (1)$$

where i and t index firm, and year, respectively, α_i denotes firm fixed effects, α_t denotes year fixed effects, EPU denotes the economic policy uncertainty proxy, firm-specific controls described in Section 3.3, and ε_{it} is an error term. The coefficient β_1 captures the effect of EPU on corporate cash holdings, controlling for all variables as well as firm and year fixed effects. A positive β_1 coefficient supports the precautionary motives hypothesis (**H1a**), while a negative coefficient supports the managerial entrenchment and political extraction prediction (**H1b**). To account for within-firm correlation, we adjust standard errors for clustering at the firm level.

Table 2 presents our main results. Model 1 is our baseline specification, which includes the Lagged EPU as the variable of interest. Models 2–5 are similar to Model 1, except they use the lagged natural log of EPU, the standard deviation of EPU (computed over the 12 months of the

⁶ The relatively few countries in our sample (19) prevents us from reliably using country-level clustering due to the small cluster problem (Petersen, 2009; Abadie, Athey, Imbens, and Wooldridge, 2017). Nevertheless, as shown in Table 4 we find similar results when we cluster standard errors at higher levels.

firm's calendar year), control for the lagged cash ratio, and apply quarterly rather than annual data, respectively. Model 6 is also similar to Model 1 but uses an alternative measure of cash holdings, the log of the ratio of cash to sales (Harford et al., 2008), as the dependent variable.

Across all models, we find a negative and significant relation (mostly at the 1% level) between EPU and the cash holding ratio. The results are also economically meaningful. For example, in Model 1, the coefficient on lagged EPU of -0.055 indicates that moving the lagged EPU from the 25th percentile (0.79) to the 75th percentile (1.37) results in an 11.6% decrease in corporate cash holdings.⁷ Similarly, in Model 3, moving the standard deviation of (EPU) from the 25th percentile (0.22) to the 75th percentile (0.51) results in a 9.1% decrease in corporate cash holdings. The control variables have their expected signs and are consistent with prior literature. We find that larger, levered, and more liquid firms are associated with lower cash holdings, and firms with higher profitability, higher volatility of cash flows, higher capital expenditures, higher R&D, and higher acquisitions are associated with higher cash holdings.

4.2. *Alternative Specifications*

Table 3 provides several robustness checks. First, we explore whether our main results are driven by the econometric model used. Therefore, in Model 1, we use OLS regression instead of panel regression. We replace firm fixed effects with country and industry fixed effects. The results show that the relation between Lagged EPU and cash holdings is not sensitive to alternative regression specification. We find that Lagged EPU is negative and significant at the 1% level. Second, we exclude China and Canada from our sample to address the concern that the relation between EPU and cash holdings is driven by the large proportion of Chinese (20%) and Canadian firms (17.7%). We show that our sample composition does not drive the relation between EPU and cash holdings.

Third, we cluster the standard errors at the country level to account for the concern that the effect of EPU is at the higher level. Fourth, the observed cash holdings during high policy

⁷ The coefficient on lagged EPU is -0.055, meaning that moving the lagged EPU from the 25th percentile (0.79) to the 75th percentile (1.37) will lead to a 0.032 ($= -0.055 \times 0.58$) decrease in $\ln(\text{Cash holdings} / \text{Net assets})$. This result indicates that firms decrease 3.25% ($= e^{-0.032} - 1$) cash holdings, which is an 11.6% decline from the mean of cash holdings (0.271).

uncertainty may reflect macro-economic conditions such as investment opportunity, or the development of the country's financial market. To test this possibility, we follow Gulen and Ion (2016) and include GDP Growth (%), GDP Growth Forecast, Inflation Forecast, and Unemployment Forecast in Model 4 to account for investment opportunity, and include Domestic Credit to Private Sector, and Stocks Traded (% GDP) in Model 5 to account for financial market development. In Model 6, we include both proxies of investment opportunity and financial market development. We find that Lagged EPU continues to be negatively and significantly related to corporate cash holdings.

In Model 7, we control for informal institutions, namely four cultural dimensions (Individualism, Power Distance, Masculinity, Uncertainty Avoidance) from Hofstede (2001) and Trust from World Values Survey. The results show that Power Distance, Masculinity, Uncertainty Avoidance, and Trust are all positively and significantly related to cash holdings. The coefficient of Individualism is insignificant. Importantly, our main independent variable (Lagged EPU) still loads significantly and negatively. In Model 8, we rerun our main specification (1) at the country level. The coefficient of the lagged EPU is negative and significant, consistent with our main findings at the firm level. Overall, the results in Table 3 support our earlier findings that policy uncertainty negatively affects corporate cash holdings.

4.3. Alternative Sources of Uncertainty

Prior research suggests that different types of uncertainty may influence corporate cash holdings. Accordingly, we control for firm-, industry-, and macroeconomic-level uncertainty, namely firm-level uncertainty, which we proxy for using return volatility (Return Volatility), industry-level uncertainty, which we measure using the first principal component from the industry-year medians of seven industry-level economic shock variables (Industry Shock) (Harford, 2005), and macroeconomic uncertainty, which we capture using the cross-sectional standard deviation of cumulative returns (Macroeconomic Return Volatility) over the past 12 months (Bonaime et al., 2018). The results, reported in Table 4 Model 1, show that the coefficient on lagged EPU remains negative and significant at the 1% level, implying that the documented effect of EPU differs from the effects of other types of uncertainty.

Prior studies exploit election events as exogenous shocks that result in increased political uncertainty (e.g., Julio and Yook, 2012). We note that while elections can elevate uncertainty, policy uncertainty can increase during nonelection years (Gulen and Ion, 2016). In Model 2, we control for timed election years collected from the World Bank’s Database of Political Institutions (DPI). We find that the coefficient on the election indicator (Election Dummy) is statistically significant at the 10% level. Importantly, the negative relation between EPU and cash holdings continues to hold, indicating that our findings are not driven by uncertainty related to elections.

Moreover, we examine whether firm-level variation in the effect of policy uncertainty, rather than macro-level EPU, drives our results. Following Hassan et al. (2019), we construct each firm’s exposure to aggregate EPU (EPU Beta) by regressing its monthly stock returns on monthly EPU over the fiscal year. We then include EPU Beta in the regression. Model 3 reports the results and shows that the coefficient on EPU Beta is statistically significant and that the coefficient on Lagged EPU remains negative and significant, suggesting that the aggregate component rather than firm-level variation in EPU explains the relation between policy uncertainty and cash holdings. Lastly, for completeness, we include all sources of uncertainty in Model 4 and find consistent results that Lagged EPU has a negative and statistically significant impact on corporate cash holdings.

4.4. Endogeneity

Several potential endogeneity concerns exist in the EPU–cash holdings relation. First, both EPU and corporate cash holdings can be simultaneously determined by omitted variables such as confounding effects from other country-level policies. To mitigate this concern, we replace country-specific EPU with the lagged global EPU measure, computed as the GDP-weighted average of national EPU indices. Global policy uncertainty is unlikely to be affected by country-specific events that could potentially determine both country-specific policy uncertainty and cash holdings. Table 5 presents the results. In Model 1, we find that the Lagged Global EPU is negative and significant at the 1% level, which suggests that unobserved country-specific factors are not responsible for the negative relation between EPU and corporate cash holdings.

Second, we estimate an instrumental variable regression. We employ Polarization, computed as the maximum difference between the executive party and the four principal parties of the legislature, and Years Left in Current Term, which measures years left in the current term for the

controlling party as instruments. We expect that, holding everything else constant, higher levels of polarization would result in higher policy-related uncertainty (Gulen and Ion, 2016), and more years left in current term for the controlling party would lead to lower uncertainty related to policy decisions. In the first-stage regression (Model 2), we regress EPU on both Polarization and Years Left in Current Term and include the full set of control variables. We find, as expected, Polarization is positively and significantly associated with EPU, and Years Left in Current Term is negatively and significantly associated with EPU.

To verify the validity of our instrument, we first conduct a Kleibergen–Paap *rk* LM test, which rejects the null hypothesis that the model is underidentified at the 1% level.⁸ In addition, the *F*-test of the excluded exogenous variable rejects the null hypothesis that the instrument does not explain EPU. Moreover, we fail to reject the null hypothesis that over-identifying restrictions are valid (*p*-value of Hansen J statistic is 0.485). Model 3 shows the results of the second-stage regression. We again find that Lagged EPU is negatively and significantly (at the 5% level) associated with corporate cash holdings.

5. EPU and the Value of Cash Holdings: The Role of the Institutional Environment

We examine the impact of country-level institutions on the relation between EPU and the value of cash holdings. Accordingly, using split samples based on institutional factors, we regress firm value, which we measure with Tobin’s Q, on the interaction between cash holdings, and policy uncertainty, and on the full set of controls. Following Kalcheva and Lins (2007), we estimate different specifications of the following regression:

$$\begin{aligned} \text{Tobin's Q}_{it} = & \alpha_i + \alpha_t + \beta_1 \text{Excess Cash}_{i,t-1} + \beta_2 \text{EPU}_{i,t-1} \\ & + \beta_3 \text{Excess Cash}_{i,t-1} \times \text{EPU}_{i,t-1} + \text{Controls}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Our focus is on the coefficient, β_3 , which captures the differential valuation effect of cash holdings during high EPU under different institutional environments. The institutional characteristics we consider are: (i) investor protection (Common, and Revised Anti-Director Rights), (ii) freedom of the press (Press Freedom), and (iii) government quality including Control of Corruption,

⁸ The *rk* LM statistic is a test of the rank of a matrix (*rk*) using a Lagrange Multiplier (LM).

Government Effectiveness, Rule of Law, Regulatory Quality, Political Stability, Voice and Accountability, Democratic Accountability, and Government Anti-Diversion Policies. We discuss each of these factors in turn.

Table 6 presents the means of country-level institutional indices across years. Of interest, in particular, are three dimensions of institutional factors: shareholder protection, press freedom, and government quality. The descriptive statistics suggest cross-country variation in institutional development, facilitating examining how cross-country variations in institutional factors affect the value of cash.

5.1. Shareholder Protection

Table 7 provides results of the valuation model. In Model 1 of Table 7, we first report results from regressing Tobin's Q on Lagged Excess Cash, Lagged EPU, their interaction terms, and control variables. The results indicate that the coefficient on the interaction between Lagged Excess Cash and Lagged EPU is negative and significant at the 5% level. The results suggest that investors discount the value of cash during high EPU.

We then split the sample by the value of investor protection proxies and examine the effect of EPU on the value of cash using split samples.⁹ Models 2 and 3 consider the segmentation based on legal origins (common vs civil), and Models 4 and 5 based on revised anti-director rights. We obtain the measures of legal origin and anti-director rights from La Porta et al. (1998). We find that the coefficient on Lagged excess cash \times Lagged EPU is negative and statistically significant at the 1% level in civil law countries, but not statistically significant in common law countries. This finding suggests that when investor protection is poor, they further discount the value of cash when policy uncertainty is high. These results are also economically significant. Holding everything else constant, for a firm from a civil law country with its excess cash holdings moving from the 25th percentile (-0.24) to the 75th percentile (0.24), an increase in EPU from the 25th percentile (0.79) to the 75th percentile (1.37) is associated with a 0.06 $(-0.225 \times (0.24+0.24) \times (1.37-0.79))$ reduction in Tobin's Q. Because the mean Tobin's Q is 1.85, this corresponds to a 3% $(0.06/1.85)$ decline in Tobin's Q. More importantly, we test the coefficient differences (i.e. Δ

⁹ Our inferences from Tables 7 and 8 remain unaffected when we use interaction analysis instead of split samples. Appendix B shows the results.

Lagged Excess Cash \times Lagged EPU) between common law and civil law countries, and find that the difference is statistically significant at the 1% level with the t -statistics being 3.818. This suggests that the strength of investor protection impacts the extent of agency conflicts between government and firms. In Models 6 and 7, we continue to find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and statistically significant at the 1% level when investor protection is weak. Taken together, the results from Models 1–7 show that although a firm’s value is lower with excess cash when there is high policy uncertainty, this effect is less pronounced in countries with greater investor protection.

5.2. Role of Freedom of the Press

We test the role of press freedom in Models 8 and 9 of Table 7. Dyck, Volchkova, and Zingales (2008) argue that the media play a role in collecting information, thus reducing the informational cost to investors. Chen et al. (2018) find that cash holdings are more valuable in countries with high media freedom. Specifically, we regress Tobin’s Q on Lagged EPU, Lagged Excess Cash, and their interaction terms using a sample split into countries with high versus low press freedom. We obtain the score of press freedom for each country in the period of 1987–2015 from Freedom House and subtract the original index from 100 such that a higher value indicates higher press freedom. Consistent with the findings in Models 1–7, we find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and significant only when press freedom is low. The results suggest that media play an important role in constraining government expropriation. These results are also economically significant. Holding everything else constant, for a firm with its excess cash holdings moving from the 25th percentile (-0.24) to the 75th percentile (0.24), an increase in EPU from the 25th percentile (0.79) to the 75th percentile (1.37) leads to a 1.3% $(-0.089 \times (0.24+0.24) \times (1.37-0.79)/1.85)$ reduction in Tobin’s Q in countries with low press freedom. More importantly, we also test the coefficient differences (i.e. Δ Lagged Excess Cash \times Lagged EPU) between high press freedom and low press freedom countries, and find that the difference is significant at the 10% level with the t -statistics being 1.769.

Overall, these results suggest that in countries with independent media, cash is valued at a premium by outside shareholders when EPU is high.

5.3. Role of Government Quality

Table 8 presents the regression results when we split the sample by several measures of government quality including Corruption, Government Effectiveness, Rule of Law, Regulatory Quality, Political Stability, Voice and Accountability, Democratic Accountability, and Government Anti-Diversion Policies (GADP). Chen et al. (2018) show that political accountability plays a key role in constraining politicians from extracting private benefits from firms. Pinkowitz et al. (2006) find that there is a discount for cash in countries with poor institutions, in particular for countries with high corruption. Models 1 and 2 of Table 8 measure government quality using control of corruption, a measure of the perception 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. We find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and statistically significant at the 1% level only in countries with low control of corruption, which suggests that cash holdings are less valuable when EPU is high. Consistent with our previous findings, the results show that a negative relation between EPU and the market value of cash holdings is more pronounced in countries with poor government quality.

In Models 3 and 4, we proxy government quality using Government Effectiveness obtained from World Governance Indicators. It is a measure of the perception 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. We find that the interaction term between Lagged Excess Cash and Lagged EPU is negative and statistically significant in countries with low government effectiveness scores. Other dimensions of government quality are Rule of Law, which measures the 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, and Regulatory Quality, a measure of the perception of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

In Models 5–8, we replicate the analyses in Models 1 and 2, and continue to find that the negative valuation effect of cash holdings during period of increased uncertainty is more pronounced in countries with low scores for rule of law and regulatory quality. Furthermore, we

argue that political extraction is more likely in countries where political stability is low and citizens have limited power in participating in government elections and freedom of expression. We therefore proxy government quality using Political Stability, and Voice and Accountability in Models 9–12. Political stability is a measure of the perception of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Voice and Accountability is a measure of the perception 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 free media. The coefficient of Lagged Excess Cash \times Lagged EPU continues to load negative and significant only in countries with low government stability and low voice and accountability.

Lastly, we explore the role of government quality using Democratic Accountability, a measure of how responsive government is to its people, and GADP, an index of government antidiversion policies used by Hall and Jones (1999). Higher values of these two measures indicate more effective policies and government. We report the results in Models 13–16. We find that politicians may be able to derive private benefits more easily in countries with poor government quality. This results in outside shareholders discounting more the value of cash holdings when policy uncertainty is high.

In summary, Table 8 findings imply that although excess cash holdings are discounted by outside shareholders, an institutional environment of better government quality mitigates concerns that managers will expropriate shareholders during periods of heightened uncertainty.

6. Conclusion

We examine the impact of EPU on firms' cash holdings using a sample of international firms. We investigate the impact of EPU, as measured and updated based on the index of Baker et al. (2016) for a sample of 19 countries, on firms' cash reserves and the valuation of cash holdings. Using a sample of 73,828 firm-year observations over the period 1988–2016, we find evidence that EPU is negatively associated with cash holdings. The results are consistent with the view that investors prefer less cash holdings because they are more concerned of managerial discretion and potential government expropriation when EPU is high. In additional analysis, we find that the market discounts excess cash holdings under high policy uncertainty, but this negative effect is

mitigated in countries with stronger institutional environments. Overall, these findings help deepen our understanding of time-series variations in corporate cash holdings.

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TABLE 1
Summary Statistics of Key Variables

Country	Obs.	Cash Ratio	EPU	Net Assets	Lev. Ratio	NWC Ratio	CF Ratio	Sales Growth	Dividend Dummy	CFV Ratio	CapX Ratio	R&D Ratio	Acq. Ratio
Australia	5,050	0.264	0.954	986.54	0.208	-0.022	-0.029	0.585	0.517	0.344	0.075	0.016	0.053
Brazil	1,159	0.184	1.079	3,268.06	0.355	-0.038	0.093	0.206	0.300	0.069	0.075	0.002	0.013
Canada	14,849	0.332	1.181	966.46	0.241	-0.018	-0.027	0.375	0.316	0.254	0.108	0.059	0.025
Chile	769	0.087	1.091	1,658.47	0.261	0.058	0.084	0.146	0.172	0.062	0.065	0.000	0.007
China	21,000	0.330	1.275	917.78	0.253	-0.048	0.079	0.239	0.254	0.066	0.082	0.002	0.004
France	5,828	0.214	1.166	3,578.51	0.254	0.020	0.082	0.086	0.198	0.071	0.058	0.020	0.022
Germany	5,634	0.251	1.079	2,716.75	0.224	0.085	0.073	0.145	0.433	0.108	0.067	0.029	0.021
India	2,283	0.158	1.167	1,303.54	0.308	0.054	0.118	0.310	0.736	0.066	0.084	0.009	0.026
Ireland	209	0.266	1.098	2,789.72	0.262	-0.023	0.053	0.273	0.498	0.136	0.042	0.015	0.065
Italy	1,656	0.170	1.066	2,777.02	0.287	0.035	0.060	0.083	0.377	0.060	0.050	0.006	0.017
Japan	2,461	0.211	1.029	721.75	0.337	-0.067	0.018	0.044	0.658	0.071	0.035	0.016	0.000
Mexico	681	0.103	1.259	3,237.90	0.277	0.033	0.086	0.191	0.166	0.046	0.059	0.000	0.017
Netherlands	996	0.154	0.946	5,533.52	0.258	0.016	0.095	0.126	0.463	0.082	0.048	0.022	0.039
Russia	250	0.106	1.276	9,508.70	0.344	-0.054	0.101	0.431	0.148	0.096	0.091	0.001	0.023
Singapore	2,550	0.277	1.017	740.08	0.245	0.025	0.061	0.258	0.480	0.138	0.060	0.003	0.021
South Korea	70	0.267	1.012	1,513.90	0.445	-0.123	0.013	0.189	0.271	0.146	0.088	0.017	0.000
Spain	658	0.116	1.059	5,816.35	0.313	-0.030	0.087	0.093	0.438	0.044	0.052	0.004	0.026
Sweden	3,006	0.252	0.894	1,408.62	0.214	0.045	0.046	0.261	0.574	0.157	0.048	0.039	0.034
United Kingdom	4,719	0.183	1.446	2,544.10	0.208	-0.036	0.068	0.346	0.543	0.152	0.045	0.026	0.062
Average/Total	73,828	0.271	1.169	1,651.39	0.249	-0.010	0.047	0.267	0.368	0.138	0.076	0.022	0.022

Note: This table presents mean statistics of key variables across countries used in the analysis. Variables definitions are provided in Appendix A.

TABLE 2
Economic Policy Uncertainty and Corporate Cash Holdings: International Evidence

	Dependent variable: Ln(Cash/Net Assets)					
	Lagged EPU	Lagged Ln(EPU)	Standard Dev. EPU	Lagged Cash Ratio	Using Quarterly Data	Ln(Cash/Sales) Ratio
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged EPU	-0.055 ^a (-3.51)			-0.053 ^a (-3.71)	-0.032 ^a (-4.43)	-0.037 ^b (-2.14)
Lagged Ln (EPU)		-0.048 ^b (-2.44)				
Standard Deviation of (EPU)			-0.091 ^a (-3.90)			
Lagged Ln (Cash / Net Assets)				0.332 ^a (35.20)		
Size	-0.374 ^a (-25.57)	-0.373 ^a (-25.54)	-0.371 ^a (-25.58)	-0.286 ^a (-18.96)	-0.361 ^a (-23.66)	-0.154 ^a (-8.86)
Leverage	-1.625 ^a (-24.06)	-1.625 ^a (-24.07)	-1.627 ^a (-24.32)	-1.175 ^a (-17.96)	-0.208 ^a (-2.67)	-1.482 ^a (-19.38)
Net Working Capital / Net Assets	-0.398 ^a (-8.77)	-0.399 ^a (-8.77)	-0.401 ^a (-8.91)	-0.470 ^a (-10.79)	-0.308 ^a (-5.54)	-0.288 ^a (-5.88)
Operating Income / Net Assets	0.310 ^a (8.93)	0.310 ^a (8.91)	0.309 ^a (8.95)	0.275 ^a (7.22)	1.475 ^a (12.77)	0.051 (1.20)
Sales Growth	0.033 ^a (5.22)	0.033 ^a (5.23)	0.033 ^a (5.26)	0.023 ^a (2.82)	0.033 ^a (4.93)	-0.057 ^a (-7.35)
Dividend Payer Dummy	0.077 ^a (4.94)	0.078 ^a (5.00)	0.083 ^a (5.36)	0.035 ^b (2.57)	0.133 ^a (14.44)	0.052 ^a (3.34)
Cash Flow Volatility	0.145 ^a (3.78)	0.146 ^a (3.79)	0.152 ^a (3.97)	0.127 ^a (3.05)	1.415 ^a (9.15)	0.089 ^c (1.82)
Capital Expenditures / Net Assets	1.374 ^a (14.51)	1.374 ^a (14.50)	1.365 ^a (14.50)	0.292 ^a (2.76)	1.524 ^a (17.51)	1.321 ^a (11.48)
R&D / Net Assets	1.203 ^a (7.55)	1.207 ^a (7.57)	1.206 ^a (7.60)	0.979 ^a (6.10)	-0.162 (-0.62)	0.865 ^a (4.01)
Acquisitions / Net Assets	0.140 ^c (1.72)	0.139 ^c (1.70)	0.148 ^c (1.82)	-0.691 ^a (-6.82)	0.359 ^a (3.00)	0.959 ^a (10.12)
Firm Fixed Effects	Yes	Yes	No	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	72,818	72,818	73,828	72,818	172,273	72,818
Adjusted R ²	0.144	0.143	0.143	0.066	0.068	0.066

Note: This table presents the results of regressions of cash holdings on EPU and several controls. The sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. The main independent variable is the lagged EPU, except for Models 2 and 3, where we use the lagged natural logarithm of EPU index, and the standard deviation of the EPU index, respectively. For Models 1–5, the dependent variable is the natural logarithm of Cash/Net assets. For Model 6, we use alternative dependent variable: the natural logarithm of Cash/Sales, respectively. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE 3
Robustness Checks

	Dependent variable: Ln (Cash/Net Assets)							
	Country Fixed Effects	Exclude China & Canada	Cluster at Country-level	Investment Opportunity	Financial Markets Development	(4) and (5) Combined	Informal Institutions	Country-level Regression
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged EPU	-0.077 ^a	-0.048 ^b	-0.055 ^b	-0.051 ^a	-0.038 ^b	-0.064 ^a	-0.058 ^c	-0.172 ^a
	(-4.21)	(-2.55)	(-1.969)	(-3.12)	(-2.505)	(-3.80)	(-1.738)	(-2.633)
GDP Growth (%)				-0.020 ^a		-0.016 ^a		
				(-6.04)		(-4.42)		
GDP Growth Forecast				-0.037 ^a		-0.060 ^a		
				(-4.02)		(-6.33)		
Inflation Forecast				0.041 ^a		0.027 ^c		
				(2.92)		(1.83)		
Unemployment Forecast				0.008		0.004		
				(1.20)		(0.64)		
Domestic Credit to Private Sector					0.002 ^a	0.002 ^a		
					(6.313)	(4.92)		
Stocks Traded (% GDP)					0.001 ^a	0.001 ^a		
					(3.952)	(3.66)		
Individualism							-0.000	
							(-0.095)	
Power Distance							0.009 ^a	
							(3.563)	
Masculinity							0.003 ^a	
							(2.941)	
Uncertainty Avoidance							0.009 ^a	
							(8.512)	
Trust							1.349 ^a	
							(6.119)	
Size	-0.092 ^a	-0.418 ^a	-0.374 ^a	-0.379 ^a	-0.291 ^a	-0.372 ^a	-0.070 ^a	-0.161 ^a
	(-13.22)	(-20.04)	(-16.947)	(-25.17)	(-17.810)	(-23.15)	(-6.278)	(-3.649)
Leverage	-2.686 ^a	-1.308 ^a	-1.625 ^a	-1.579 ^a	-1.103 ^a	-1.501 ^a	-2.542 ^a	0.027
	(-45.17)	(-14.54)	(-8.501)	(-23.25)	(-15.448)	(-20.98)	(-26.250)	(0.034)
Net Working Capital / Net Assets	-0.550 ^a	-0.600 ^a	-0.398 ^a	-0.409 ^a	-0.456 ^a	-0.416 ^a	-0.694 ^a	-1.616 ^b
	(-12.10)	(-9.18)	(-5.553)	(-8.78)	(-9.917)	(-8.48)	(-8.698)	(-2.539)

Cash Flow / Net Assets	0.176 ^a (4.52)	0.265 ^a (5.67)	0.310 ^c (1.826)	0.298 ^a (8.35)	0.363 ^a (8.421)	0.388 ^a (9.69)	0.080 (1.339)	0.445 (0.552)
Sales Growth	0.019 ^a (2.73)	0.027 ^a (3.13)	0.033 ^a (2.887)	0.033 ^a (5.19)	0.025 ^a (2.818)	0.028 ^a (4.09)	0.017 (1.353)	0.284 (1.050)
Dividend Payer Dummy	0.064 ^a (3.34)	0.097 ^a (5.54)	0.077 ^a (4.924)	0.094 ^a (6.21)	0.035 ^b (2.512)	0.112 ^a (7.26)	0.090 ^a (2.677)	0.127 (0.903)
Cash Flow Volatility	0.440 ^a (12.68)	0.079 (1.60)	0.145 ^a (4.310)	0.138 ^a (3.41)	0.088 ^c (1.876)	0.107 ^b (2.30)	0.424 ^a (7.504)	-0.801 (-1.403)
Capital Expenditures / Net Assets	1.559 ^a (12.37)	1.089 ^a (8.18)	1.374 ^a (8.882)	1.404 ^a (15.16)	0.395 ^a (3.547)	1.395 ^a (14.39)	1.526 ^a (6.467)	-1.613 (-1.007)
R&D / Net Assets	3.304 ^a (28.00)	1.063 ^a (5.53)	1.203 ^a (9.983)	1.299 ^a (8.42)	0.895 ^a (4.698)	1.242 ^a (6.82)	3.036 ^a (18.865)	5.760 ^a (3.453)
Acquisitions / Net Assets	0.118 (1.21)	0.263 ^a (2.76)	0.140 (1.301)	0.196 ^b (2.38)	-0.666 ^a (-6.192)	0.221 ^b (2.54)	-0.073 (-0.456)	-3.744 (-1.511)
Firm Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	No	No	No	No	No	No	No
Industry Fixed Effects	Yes	No	No	No	No	No	Yes	No
Observations	72,818	36,970	72,818	67,841	48,314	45,924	20,258	345
Adjusted R ²	0.346	0.125	0.144	0.148	0.225	0.218	0.332	0.146

Note: This table presents results of regressing cash holdings on EPU and several controls. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. The independent variable is the lagged EPU index and the dependent variable is the natural logarithm of Cash/Net assets. All regressions include firm and year fixed effects except for Model 1. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE 4
Other Sources of Uncertainty

	Dependent Variable: Ln (Cash / Net assets)			
	Macro. Return Volatility	Election Dummy	EPU Beta	All Sources of Uncertainty
	(1)	(2)	(3)	(4)
Lagged EPU	-0.046 ^a (-2.864)	-0.036 ^b (-2.042)	-0.055 ^b (-2.248)	-0.052 ^b (-2.09)
Size	-0.377 ^a (-23.621)	-0.389 ^a (-20.114)	-0.311 ^a (-11.788)	-0.322 ^a (-12.22)
Leverage	-1.400 ^a (-19.753)	-1.430 ^a (-17.762)	-1.410 ^a (-13.968)	-1.394 ^a (-13.81)
Net Working Capital / Net Assets	-0.467 ^a (-9.036)	-0.499 ^a (-8.659)	-0.600 ^a (-8.006)	-0.609 ^a (-8.07)
Cash Flow / Net Assets	0.484 ^a (11.286)	0.436 ^a (9.365)	0.719 ^a (9.466)	0.695 ^a (9.33)
Sales Growth	0.036 ^a (5.001)	0.036 ^a (4.470)	0.031 ^a (2.830)	0.033 ^a (2.96)
Dividend Payer Dummy	0.070 ^a (5.352)	0.094 ^a (6.475)	0.062 ^a (3.535)	0.049 ^a (2.81)
Cash Flow Volatility	0.100 ^b (2.148)	0.045 (0.772)	0.125 (1.348)	0.108 (1.17)
Capital Expenditures / Net Assets	1.365 ^a (14.784)	1.224 ^a (11.836)	1.245 ^a (9.169)	1.198 ^a (8.82)
R&D / Net Assets	0.973 ^a (5.657)	1.024 ^a (5.485)	1.834 ^a (5.438)	1.820 ^a (5.33)
Acquisitions / Net Assets	0.113 (1.280)	0.185 ^c (1.850)	0.143 (1.093)	0.084 (0.64)
Return Volatility	-0.237 ^a (-2.966)			-0.602 ^b (-2.18)
Industry Shock	0.046 ^a (6.633)			0.026 ^b (2.38)
Macroeconomic Return Volatility	-3.928 ^a (-5.425)			-4.603 ^a (-5.08)
Election Dummy		0.031 ^c (1.668)		0.039 (1.60)
EPU Beta			0.001 ^a (3.795)	-0.001 (-1.29)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	59,693	47,560	30,730	30,468
Adjusted R ²	0.155	0.139	0.134	0.137

Note: This table presents the results of regressions of cash holdings on EPU while controlling for other sources of uncertainty. The sample includes 59,693 firm-years consisting of 10,648 unique publicly traded firms from 19 countries between 1988 and 2015. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE 5
Economic Policy Uncertainty and Cash Holdings: Endogeneity

	<u>Use Global EPU Index to Proxy Country- Specific EPU</u>	<u>Instrumental Variable 2SLS Regression</u>	
	Ln(Cash/ Net Assets)	First Stage: EPU	Second Stage: Ln(Cash/Net Assets)
	(1)	(2)	(3)
Instrumented Lagged EPU			-0.526 ^b (-2.04)
Lagged Global EPU	-0.220 ^a (-4.15)		
Polarization		0.007 ^b (2.17)	
Years Left in Current Term		-0.010 ^a (-11.40)	
Size	-0.382 ^a (-26.51)	-0.022 ^a (-7.31)	-0.340 ^a (-17.95)
Leverage	-1.553 ^a (-23.67)	0.032 ^b (2.34)	-1.599 ^a (-19.98)
Net Working Capital / Net Assets	-0.394 ^a (-8.66)	-0.014 ^c (-1.73)	-0.444 ^a (-8.63)
Cash Flow / Net assets	0.298 ^a (8.47)	0.005 (0.87)	0.305 ^a (7.21)
Sales Growth	0.035 ^a (5.51)	-0.001 (-0.83)	0.035 ^a (4.23)
Dividend Payer Dummy	0.084 ^a (6.14)	0.032 ^a (7.39)	0.066 ^a (3.77)
Cash Flow Volatility	0.146 ^a (3.73)	-0.026 ^a (-3.97)	0.182 ^a (3.51)
Capital Expenditures / Net Assets	1.469 ^a (16.32)	-0.034 ^c (-1.81)	1.233 ^a (10.82)
R&D / Net Assets	1.271 ^a (8.67)	-0.067 ^b (-2.15)	1.221 ^a (6.07)
Acquisitions / Net Assets	0.130 (1.60)	-0.121 ^a (-5.03)	0.091 (0.92)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	69,881	55,169	55,063
Adjusted R ²	0.148	0.720	0.127
Underidentification test: Kleibergen–Paap <i>rk</i> LM statistic		184.524 (<i>p</i> = 0.00)	
Weak identification test: Kleibergen–Paap <i>rk</i> Wald <i>F</i> statistic		95.955 0.36	
Overidentification test: Hansen <i>J</i> statistic		(p= 0.485)	

Note: This table presents the results of regressions of cash holdings on EPU and several controls. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE 6
Summary Statistics of Country-level Institutional Variables

Country	Common	Revised Anti- Director Rights	GADP	Press Freedom	Control of Corrupt.	Gov. Effective.	Rule of Law	Reg. Quality	Political Stability	Voice and Account.	Democrat Account.
Australia	1	4.000	0.931	82.052	1.963	1.744	1.763	1.672	0.977	1.447	6.000
Brazil	0	5.000	0.682	61.120	-0.055	-0.061	-0.289	0.172	-0.126	0.350	4.583
Canada	1	4.000	0.976	82.731	2.035	1.861	1.741	1.611	1.020	1.501	5.950
Chile	0	4.000	0.646	73.302	1.447	1.186	1.256	1.447	0.505	0.941	4.354
China	0	1.000	0.641	16.426	-0.489	0.074	-0.417	-0.243	-0.511	-1.577	1.303
France	0	3.500	0.941	77.776	1.364	1.568	1.407	1.084	0.569	1.224	5.575
Germany	0	3.500	0.963	84.654	1.895	1.697	1.639	1.484	0.977	1.367	5.367
India	1	5.000	0.591	62.416	-0.449	-0.048	0.022	-0.353	-1.175	0.408	6.000
Ireland	1	5.000	0.889	84.335	1.639	1.526	1.715	1.719	1.066	1.397	6.000
Italy	0	2.000	0.815	69.696	0.389	0.629	0.594	0.875	0.636	1.024	4.818
Japan	0	4.500	0.932	80.599	1.154	1.253	1.259	0.903	1.064	0.962	5.001
Mexico	0	3.000	0.592	50.709	-0.328	0.220	-0.498	0.351	-0.476	0.130	5.722
Netherlands	0	2.500	0.988	87.968	2.086	1.861	1.790	1.752	0.978	1.589	6.000
Russia	0	4.000	0.631	20.432	-0.974	-0.369	-0.798	-0.366	-0.926	-0.914	2.390
Singapore	1	5.000	0.859	33.209	2.236	2.134	1.699	1.873	1.139	-0.132	2.000
South Korea	0	4.500	0.735	71.129	0.366	0.817	0.848	0.689	0.283	0.627	5.980
Spain	0	5.000	0.802	77.131	1.064	1.264	1.129	1.143	-0.010	1.138	5.952
Sweden	0	3.500	0.987	90.193	2.266	1.972	1.873	1.579	1.240	1.599	6.000
United Kingdom	1	5.000	0.933	79.755	1.715	1.629	1.710	1.753	0.419	1.336	5.999
Average/Total	0.402	3.148	0.836	60.062	1.020	1.134	0.929	0.907	0.388	0.416	4.320

Note: This table presents means of country-level variables across years. Variables definitions are provided in Appendix A.

TABLE 7
Investor Protection, Press Freedom, Economic Policy Uncertainty, and the Value of Excess Cash Holdings (*Tobin's Q*)

	<u>Legal Origin</u>		<u>Revised Anti-Director Rights</u>		<u>Press Freedom</u>		
	Common	Civil	High	Low	High	Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lagged Excess Cash	0.178 ^a (2.99)	0.151 (1.60)	0.220 ^a (3.25)	0.151 (1.64)	0.210 ^a (3.04)	0.165 ^c (1.80)	-0.058 (-0.81)
Lagged EPU (×100)	0.036 ^b (2.10)	-0.049 ^b (-1.95)	0.064 ^b (2.52)	-0.057 ^a (-2.64)	0.108 ^a (3.77)	-0.056 ^b (-2.00)	0.032 (1.33)
Lagged Excess Cash × Lagged EPU (×100)	-0.081 ^b (-2.07)	0.072 (1.12)	-0.225 ^a (-5.17)	0.067 (1.07)	-0.218 ^a (-4.95)	0.056 (0.79)	-0.089 ^b (-2.14)
lagged Size	-0.494 ^a (-20.72)	-0.459 ^a (-12.29)	-0.524 ^a (-18.29)	-0.443 ^a (-12.46)	-0.542 ^a (-18.18)	-0.455 ^a (-13.81)	-0.593 ^a (-16.82)
Lagged Leverage	-0.137 (-1.51)	0.189 (1.33)	-0.193 ^c (-1.82)	0.194 (1.46)	-0.190 ^c (-1.69)	0.216 ^c (1.76)	-0.251 ^b (-2.00)
Lagged (Net Working Capital / Total Assets)	-0.707 ^a (-8.23)	-0.567 ^a (-4.04)	-0.709 ^a (-7.01)	-0.538 ^a (-4.22)	-0.736 ^a (-6.89)	-0.442 ^a (-3.91)	-0.845 ^a (-7.22)
Lagged (Cash Flow / Total Assets)	0.269 ^a (3.08)	0.057 (0.51)	0.523 ^a (3.90)	0.049 (0.46)	0.542 ^a (3.68)	0.124 (1.29)	0.406 ^b (2.04)
Lagged Sales Growth	0.035 ^a (4.33)	0.033 ^a (2.98)	0.030 ^a (2.81)	0.033 ^a (3.10)	0.028 ^b (2.46)	0.044 ^a (4.11)	0.021 ^c (1.91)
Lagged Cash Flow Volatility	0.509 ^a (3.39)	0.273 (1.34)	0.826 ^a (3.92)	0.278 (1.43)	0.875 ^a (3.96)	0.213 (1.15)	0.683 ^a (2.79)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,169	20,638	34,531	24,499	30,670	25,822	28,151
Adjusted R ²	0.148	0.125	0.217	0.121	0.236	0.122	0.267
Δ Lagged Excess Cash × Lagged EPU (×100)			0.297 ^a (3.818)		0.285 ^a (3.717)		0.145 ^c (1.769)

Note: This table presents the results of regressions of Tobin's Q on cash holdings, and EPU. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. Excess cash is measured as the residual of baseline regression specification (1) in Table 3 excluding EPU. Tobin's Q is market value of equity plus total assets less book value of equity, all divided by total assets. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE 8
Government Quality, Economic Policy Uncertainty, and the Value of Excess Cash Holdings (*Tobin's Q*)

	<u>Corruption</u>		<u>Government Effectiveness</u>		<u>Rule of Law</u>		<u>Regulatory Quality</u>	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged Excess Cash	0.127	0.020	0.137	-0.002	0.122	-0.030	0.098	0.014
	(1.47)	(0.27)	(1.46)	(-0.03)	(1.41)	(-0.40)	(1.13)	(0.19)
Lagged EPU	-0.019	-0.037	-0.065 ^b	0.051 ^b	0.009	-0.064 ^b	-0.020	-0.040
	(-0.76)	(-1.46)	(-2.10)	(2.31)	(0.37)	(-2.56)	(-0.78)	(-1.57)
Lagged Excess Cash × Lagged EPU	0.074	-0.138 ^a	0.064	-0.110 ^a	0.081	-0.111 ^b	0.078	-0.133 ^a
	(1.18)	(-3.13)	(0.88)	(-2.62)	(1.30)	(-2.53)	(1.22)	(-3.02)
Lagged Size	-0.455 ^a	-0.593 ^a	-0.483 ^a	-0.594 ^a	-0.454 ^a	-0.621 ^a	-0.436 ^a	-0.600 ^a
	(-12.91)	(-17.94)	(-13.11)	(-18.32)	(-12.98)	(-18.47)	(-12.37)	(-17.90)
Lagged Leverage	0.287 ^b	-0.243 ^c	0.339 ^b	-0.266 ^b	0.284 ^b	-0.219 ^c	0.292 ^b	-0.229 ^c
	(2.26)	(-1.94)	(2.51)	(-2.18)	(2.25)	(-1.74)	(2.27)	(-1.80)
Lagged (Net Working Capital / Total Assets)	-0.450 ^a	-0.780 ^a	-0.441 ^a	-0.781 ^a	-0.459 ^a	-0.766 ^a	-0.464 ^a	-0.800 ^a
	(-3.92)	(-6.77)	(-3.49)	(-6.98)	(-4.01)	(-6.68)	(-4.04)	(-6.90)
Lagged (Cash Flow / Total Assets)	0.206 ^b	0.331 ^c	0.195 ^c	0.355 ^b	0.206 ^b	0.363 ^c	0.174 ^c	0.378 ^c
	(2.17)	(1.73)	(1.95)	(1.98)	(2.18)	(1.86)	(1.86)	(1.91)
Lagged Sales Growth	0.034 ^a	0.033 ^a	0.036 ^a	0.022 ^b	0.035 ^a	0.030 ^a	0.031 ^a	0.032 ^a
	(3.37)	(2.70)	(3.36)	(1.98)	(3.50)	(2.63)	(3.120)	(2.66)
Lagged Cash flow Volatility	0.146	0.907 ^a	0.174	0.805 ^a	0.156	0.797 ^a	0.178	0.951 ^a
	(0.84)	(3.59)	(0.94)	(3.28)	(0.90)	(3.18)	(1.03)	(3.70)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,972	27,262	23,605	29,629	26,156	27,078	26,012	27,222
Adjusted R ²	0.119	0.269	0.126	0.258	0.120	0.270	0.116	0.276
Δ Lagged Excess Cash × Lagged EPU (×100)		0.212 ^a		0.174 ^b		0.192 ^a		0.211 ^a
		(2.76)		(2.08)		(2.52)		(2.71)

Table 8 (Continued)

	Political Stability		Voice and Accountability		Democratic Accountability		Government Anti-Diversion Policies (GADP)	
	High	Low	High	Low	High	Low	High	Low
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Lagged Excess Cash	0.135 (1.41)	-0.065 (-0.89)	0.123 (1.45)	-0.010 (-0.13)	0.142 ^c (1.69)	0.209 ^b (2.51)	0.181 ^b (2.20)	0.019 (0.24)
Lagged EPU	-0.052 (-1.56)	0.085 ^a (3.92)	-0.009 (-0.39)	-0.043 ^c (-1.78)	-0.047 ^b (-2.57)	0.089 ^b (2.32)	-0.034 (-1.18)	0.038 ^c (1.66)
Lagged Excess Cash × Lagged EPU	0.065 (0.85)	-0.080 ^b (-2.06)	0.080 (1.38)	-0.103 ^b (-2.17)	0.049 (0.89)	-0.110 ^c (-1.88)	0.047 (0.84)	-0.127 ^a (-2.62)
Lagged Size	-0.466 ^a (-12.97)	-0.603 ^a (-18.62)	-0.458 ^a (-13.38)	-0.630 ^a (-17.06)	-0.445 ^a (-12.89)	-0.693 ^a (-17.68)	-0.454 ^a (-13.63)	-0.571 ^a (-16.42)
Lagged Leverage	0.292 ^b (2.23)	-0.263 ^b (-2.06)	0.281 ^b (2.22)	-0.212 ^c (-1.68)	0.232 ^c (1.80)	0.013 (0.10)	0.205 ^c (1.68)	-0.296 ^b (-2.46)
Lagged (Net Working Capital / Total Assets)	-0.460 ^a (-3.90)	-0.764 ^a (-6.50)	-0.454 ^a (-3.91)	-0.786 ^a (-6.89)	-0.415 ^a (-3.18)	-0.729 ^a (-6.44)	-0.449 ^a (-3.93)	-0.847 ^a (-7.48)
Lagged (Cash Flow / Total Assets)	0.185 ^c (1.90)	0.270 (1.42)	0.193 ^b (2.01)	0.347 ^c (1.88)	0.064 (0.61)	0.340 ^b (2.12)	0.136 (1.28)	0.421 ^a (2.87)
Lagged Sales Growth	0.033 ^a (3.18)	0.027 ^b (2.26)	0.035 ^a (3.47)	0.036 ^a (3.22)	0.036 ^a (3.36)	0.043 ^a (3.63)	0.048 ^a (4.19)	0.019 ^c (1.82)
Lagged Cash Flow Volatility	0.157 (0.87)	0.819 ^a (3.43)	0.184 (1.05)	0.646 ^a (2.66)	0.289 (1.45)	0.652 ^a (2.67)	0.394 ^c (1.95)	0.507 ^b (2.52)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,929	27,305	25,957	27,277	24,988	26,229	26,220	28,949
Adjusted R ²	0.119	0.272	0.121	0.274	0.126	0.297	0.127	0.245
Δ Lagged Excess Cash × Lagged EPU (×100)	0.145 ^c (1.693)		0.183 ^a (2.445)		0.159 ^b (1.984)		0.174 ^a (2.345)	

Note: This table presents the results of regressions of the value of cash holdings on EPU and government quality. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. Excess cash is measured as the residual of baseline regression specification (1) in Table 3 excluding EPU. Tobin's Q is market value of equity plus total assets less book value of equity, all divided by total assets. All regressions include firm and year fixed effects. We winsorize all financial variables at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

APPENDIX A
Variable Definitions

Variable	Definition	Sources
<i>Policy Uncertainty Variables</i>		
EPU	The average of the EPU index in the 12 months of the firm's calendar year scaled by 100.	Baker et al. (2016)
Standard Deviation of (EPU)	The standard deviation of EPU over the 12 months of the firm's calendar year scaled by 100.	Baker et al. (2016)
Global EPU	The global EPU index, calculated as the GDP-weighted average of national EPU indices.	Baker et al. (2016)
<i>Dependent Variables</i>		
Ln (Cash / Sales)	The natural logarithm of cash and short-term investment divided by sales.	Compustat Global
Tobin's Q	Market value of equity plus total assets less book value of equity, all divided by total assets.	Compustat Global
<i>Control Variables</i>		
Size	The natural logarithm of cash and short-term investment divided by net assets. Net assets is defined as total assets minus cash and short-term investment.	Compustat Global
Leverage	Total debt over total assets	Compustat Global
Net Working Capital / Net Assets	Net working capital over net assets. Net working capital is calculated as current assets minus current liability and cash and short-term investment. Net assets is total assets minus cash and short-term investment.	Compustat Global
Cash Flow / Net Assets	Cash flow divided by net assets. Cash flow is income before extraordinary items, plus R&D expenditures, and plus depreciation. Net assets is total assets minus cash and short-term investment.	Compustat Global
Sales Growth	The difference of sales in year t and year t-1, divided by sales in year t-1.	Compustat Global
Dividend Payer Dummy	Dummy variable that equals one if dividend payout is greater than zero, and zero otherwise	Compustat Global
Cash Flow Volatility	Standard deviation of cash flows divided by net assets over 5-year period. Cash flow is income before extraordinary items, plus R&D expenditures, and plus depreciation. Net assets is total assets minus cash and short-term investment.	Compustat Global
Capital Expenditures / Net Assets	Capital expenditures divided by net assets. Net assets is total assets minus cash and short-term investment.	Compustat Global
R&D / Net Assets	R&D expenditures divided by net assets. Net assets is total assets minus cash and short-term investment.	Compustat Global
Acquisitions / Net Assets	Acquisition expenditures divided by net assets. Net assets is total assets minus cash and short-term investment.	Compustat Global
GDP Growth	GDP growth rate.	WDI
GDP Growth Forecast	GDP growth forecast	WCR
Inflation Forecast	Inflation forecast	WCR
Unemployment Forecast	Unemployment forecast	WCR
Domestic Credit to Private Sector	Domestic credit to private sector as percent of GDP	WCR
Stocks Traded (% GDP)	Stocks trading volume as percent of GDP	WCR

Return Volatility	A firm's stock return volatility over the past 12 months.	Compustat Global
Industry Shock	The first principal component from the industry-year medians of seven industry-level economic shock variables.	Compustat Global
Macroeconomic Return Volatility	The cross-sectional standard deviation of cumulative returns over the past 12 months.	Compustat Global
Election Dummy	A dummy variable equals 1 for years if legislative or presidential election held.	DPI
EPU Beta	A measure of each firm's exposure to aggregate EPU. It is obtained by regressing its monthly stock returns on monthly EPU over the fiscal year.	Compustat Global
Polarization	Maximum difference between the executive party and the four principal parties of the legislature.	DPI (2015)
Years Left in Current Term	Years left in current term for the controlling party	DPI (2015)
Total Assets	Total assets in million \$	Compustat Global
Net Working Capital / Total Assets	Net working capital over total assets. Net working capital is calculated as current assets minus current liability and cash and short-term investment.	Compustat Global
Cash Flow / Total Assets	Cash flow divided by total assets. Cash flow is income before extraordinary items, plus R&D expenditures, and plus depreciation.	Compustat Global
Cash Flow Volatility	Standard deviation of cash flows divided by total assets over 5-year period. Cash flow is income before extraordinary items, plus R&D expenditures, and plus depreciation.	Compustat Global
Excess Cash	The residual of baseline cash holdings regression specification excluding EPU.	Compustat Global
Common Law	A dummy variable indicating common law countries.	La Porta et al. (1998)
<i>Governance Variables</i>		
Revised Anti-Director Rights	Revised anti-director rights index	Djankov et al. (2008)
Press Freedom	Press freedom index from Freedom House. We subtract the original index from 100 such that a higher value indicates higher press freedom.	Freedom House
Control of Corruption	A measure of the perception 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.	WGI
Government Effectiveness	A measure of the 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 commitment to such policies.	WGI
Rule of Law	A measure of the 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.	WGI
Regulatory Quality	A measure of the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	WGI
Political Stability	A measure of the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.	WGI

Voice and Accountability	A measure of the 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 free media.	WGI
Democratic Accountability	A measure of how responsive government is to its people.	ICRG
GADP	An index of government antidiversion policies. It is calculated as the average of five variables from the International Country Risk Guide (ICRG), namely: (i) law and order, (ii) bureaucratic quality, (iii) corruption, (iv) risk of expropriation, and (v) government repudiation of contract. A higher value indicates more effective policies for supporting production.	Hall and Jones (1999)

Note: This table provides definitions for the variables used in the analysis, along with their data sources. Compustat Global database provides financial information database, WDI is the World Development Indicators database, WCR is the World Competitiveness Report database, DPI is the Database of Political Institutions (2015), WGI is the World Governance Indicators database, and ICRG is the International Country Risk Guide.

APPENDIX B

Robustness Checks

In this appendix, we report regression the results of several robustness checks.

In Model 2 of Table A1, we assess the interaction between investor protection and EPU on the value of cash holdings. Specifically, we regress Tobin's Q on Lagged Excess Cash, Lagged EPU, legal origin (Common), and their interaction terms. Focusing on the interactions, we continue to find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and statistically significant, suggesting that outside investors discount the value of cash holdings when policy uncertainty is high. The coefficient on the three-way interaction among Common, Lagged Excess Cash, and Lagged EPU is positive and significant. This indicates that when investor protection is poor, investors further discount the value of cash holdings when policy uncertainty is high. These results are economically significant. Holding everything else constant, for a firm with its excess cash holdings moving from the 25th percentile (-0.24) to the 75th percentile (0.24), an increase in EPU from the 25th percentile (0.79) to the 75th percentile (1.37), and from a common law country (Common=1) to a civil law country (Common=0) are associated with a 0.09 ($0.325 \times (0.24+0.24) \times (1.37-0.79) \times (0-1)$) reduction in Tobin's Q. Because the mean Tobin's Q is 1.85, this corresponds to a 5% ($0.09/1.85$) decline in Tobin's Q. In Model 3, we replace Common with Revised anti-director rights obtained from Djankov et al. (2008). A higher revised anti-director rights indicates stronger investor protection. We continue to find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and statistically significant at the 1% level, and the three-way interaction term among Revised Anti-director Rights, Lagged Excess Cash, and Lagged EPU is positive and significant at the 1% level. These results support empirical evidences using split sample.

In Table A2, we find that the coefficient on Lagged Excess Cash \times Lagged EPU is negative and statistically significant at the 1% level, suggesting that cash holdings are less valuable when policy uncertainty is high. More importantly, the three-way interaction among Press Freedom, Lagged Excess Cash, and Lagged EPU is positive and significant at the 1% level.

In Table A3, we find that the three-way interactions among proxies of Government Quality, Lagged Excess Cash, and Lagged EPU are positive and significant at the 1% or 5% level.

In Table A4, we explore the effect of investor protection on cash holdings and find a negative and significant impact. Importantly, our main results still hold after controlling for the investor protection variables.

In Table A5, we investigate the adjustment of cash holdings. The main dependent variable is the change in cash holdings. Cash* is the predicted optimal cash level based on specification (1) without EPU. The negative coefficient of the interaction term (Lagged EPU \times (Cash*–Lagged Cash)) implies that firms facing higher policy uncertainty tend to adjust cash holdings more slowly, consistent with our main findings.

In Table A6, we control for lagged cash holdings (Lagged Cash), which is positively and significantly associated with cash holdings (Ln (Cash/Net Assets)). Our main evidence still holds after controlling for lagged cash holdings.

TABLE A1
Economic Policy Uncertainty and the Value of Excess Cash Holdings: Three-Way Interactions

	Dependent Variable:		<u>Tobin's Q</u>
	(1)	(2)	(3)
Lagged Excess Cash	0.178 ^a (2.99)	0.245 ^a (3.61)	-0.068 (-0.55)
Lagged EPU (×100)	0.036 ^b (2.10)	0.138 ^a (6.31)	0.310 ^a (10.89)
Lagged Excess Cash × Lagged EPU (×100)	-0.081 ^b (-2.07)	-0.266 ^a (-5.96)	-0.311 ^a (-4.05)
Common Law × Lagged Excess Cash		-0.071 (-0.62)	
Common Law × Lagged EPU (×100)		-0.149 ^a (-5.82)	
Common law × Lagged Excess Cash × Lagged EPU (×100)		0.325 ^a (4.15)	
Revised Anti-Director Rights × Lagged Excess Cash			0.082 ^b (2.21)
Revised Anti- Director Rights × Lagged EPU (×100)			-0.074 ^a (-10.44)
Revised Anti- Director Rights × Lagged Excess Cash × Lagged EPU (×100)			0.078 ^a (3.42)
lagged Size	-0.494 ^a (-20.72)	-0.498 ^a (-20.89)	-0.503 ^a (-21.08)
Lagged Leverage	-0.137 (-1.51)	-0.107 (-1.19)	-0.105 (-1.17)
Lagged (NWC / Total Assets)	-0.707 ^a (-8.23)	-0.713 ^a (-8.38)	-0.717 ^a (-8.51)
Lagged (Cash Flow / Total Assets)	0.269 ^a (3.08)	0.271 ^a (3.10)	0.273 ^a (3.13)
Lagged Sales Growth	0.035 ^a (4.33)	0.034 ^a (4.19)	0.034 ^a (4.16)
Lagged Volatility of Cash Flow / Total Assets	0.509 ^a (3.39)	0.502 ^a (3.34)	0.480 ^a (3.20)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	55,169	55,169	55,169
Adjusted R ²	0.148	0.152	0.156

Note: This table presents the results of regressions of cash holdings on EPU. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. Excess cash is measured as the residual of baseline regression specification (1) in Table 3 excluding EPU. Tobin's Q is market value of equity plus total assets less book value of equity, all divided by total assets. All regressions include firm and year fixed effects. We winsorize all financial variables at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE A2
Press Freedom, Economic Policy Uncertainty, and the Value of Excess Cash Holdings: Three-Way Interactions

Dependent Variable: Tobin's Q	
	(1)
Lagged Excess Cash	-0.058 (-0.50)
Lagged EPU	0.326 ^a (11.86)
Press Freedom	-0.012 ^a (-4.31)
Lagged Excess Cash × Lagged EPU	-0.279 ^a (-3.67)
Press Freedom × Lagged Excess Cash	0.003 (1.58)
Press Freedom × Lagged EPU	-0.005 ^a (-10.95)
Press Freedom × Lagged Excess Cash × Lagged EPU	0.004 ^a (3.18)
Lagged Size	-0.520 ^a (-21.04)
Lagged Leverage	-0.063 (-0.69)
Lagged (NWC / Total Assets)	-0.706 ^a (-8.33)
Lagged (Cash Flow / Total Assets)	0.308 ^a (3.59)
Lagged Sales Growth	0.031 ^a (3.93)
Lagged Volatility of Cash Flow / Total Assets	0.434 ^a (2.85)
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	53,973
Adjusted R ²	0.159

Note: This table presents the results of regressions of the value of cash holdings on EPU and press freedom. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. Excess cash is measured as the residual of baseline regression specification (1) in Table 3 excluding EPU. Tobin's Q is market value of equity plus total assets less book value of equity, all divided by total assets. All regressions include firm and year fixed effects. We winsorize all financial variables at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE A3
Government Quality, Economic Policy Uncertainty, and the Value of Excess Cash Holdings: Three-Way Interactions

	Dependent Variables:		Tobin's Q					
	Control of Corruption	Government Effectiveness	Rule of Law	Regulatory Quality	Political Stability	Voice and Accountability	Democratic Accountability	Government Antidiversion Policies (GADP)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged Excess Cash	0.036 (0.52)	-0.022 (-0.24)	0.002 (0.03)	-0.019 (-0.25)	0.028 (0.47)	0.104 ^c (1.80)	0.144 (1.12)	-0.599 ^c (-1.95)
Lagged EPU	0.116 ^a (6.14)	0.184 ^a (8.52)	0.101 ^a (5.40)	0.088 ^a (4.64)	0.038 ^b (2.09)	0.088 ^a (5.19)	0.402 ^a (13.66)	0.467 ^a (7.32)
Lagged Excess Cash × Lagged EPU	-0.155 ^a (-3.52)	-0.144 ^a (-2.60)	-0.138 ^a (-3.06)	-0.142 ^a (-3.07)	-0.075 ^b (-2.08)	-0.085 ^b (-2.27)	-0.276 ^a (-3.14)	-0.533 ^a (-2.68)
Control of Corruption	-0.001 (-0.02)							
Control of Corruption × Lagged Excess Cash	0.078 (1.54)							
Control of Corruption × Lagged EPU	-0.096 ^a (-8.37)							
Control of Corruption × Lagged Excess Cash × Lagged EPU	0.101 ^a (2.83)							
Government Effectiveness		1.153 ^a (18.85)						
Government Effectiveness × Lagged Excess Cash		0.092 (1.32)						
Government Effectiveness × Lagged EPU		-0.103 ^a (-6.71)						
Government Effectiveness × Lagged Excess Cash × Lagged EPU		0.112 ^b (2.36)						
Rule of Law			1.188 ^a (15.09)					
Rule of Law × Lagged Excess Cash			0.117 ^b					

	(2.02)		
Rule of Law × Lagged EPU	-0.098 ^a		
	(-7.86)		
Rule of Law × Lagged Excess Cash × Lagged EPU	0.099 ^a		
	(2.58)		
Regulatory Quality	-0.418 ^a		
	(-7.59)		
Regulatory Quality × Lagged Excess Cash	0.165 ^b		
	(2.53)		
Regulatory Quality × Lagged EPU	-0.068 ^a		
	(-5.13)		
Regulatory Quality × Lagged Excess Cash × Lagged EPU	0.090 ^b		
	(2.12)		
Political Stability		-0.027	
		(-0.62)	
Political Stability × Lagged Excess Cash		0.171 ^b	
		(2.37)	
Political Stability × Lagged EPU		-0.068 ^a	
		(-4.17)	
Political Stability × Lagged Excess Cash × Lagged EPU		0.097 ^c	
		(1.87)	
Voice and Accountability			0.430 ^a
			(4.40)
Voice and Accountability × Lagged Excess Cash			0.069
			(1.63)
Voice and Accountability × Lagged EPU			-0.094 ^a
			(-10.46)
Voice and Accountability × Lagged Excess Cash × Lagged EPU			0.083 ^a
			(2.96)
Democratic Accountability			0.297 ^a
			(8.61)
Democratic Accountability × Lagged Excess Cash			0.019

							(0.68)	
Democratic Accountability × Lagged EPU							-0.067 ^a	
							(-11.98)	
Democratic Accountability × Lagged Excess Cash × Lagged EPU							0.048 ^a	
							(2.59)	
GADP × Lagged Excess Cash								0.873 ^b
								(2.36)
GADP × Lagged EPU								-0.532 ^a
								(-6.60)
GADP × Lagged Excess Cash × Lagged EPU								0.562 ^b
								(2.29)
Lagged Size	-0.518 ^a	-0.525 ^a	-0.519 ^a	-0.520 ^a	-0.515 ^a	-0.524 ^a	-0.547 ^a	-0.500 ^a
	(-21.04)	(-21.46)	(-21.12)	(-21.13)	(-20.99)	(-21.31)	(-21.11)	(-20.85)
Lagged Leverage	-0.064	-0.036	-0.046	-0.061	-0.075	-0.055	-0.018	-0.109
	(-0.69)	(-0.39)	(-0.50)	(-0.66)	(-0.80)	(-0.60)	(-0.20)	(-1.21)
Lagged (NWC / Total Assets)	-0.713 ^a	-0.715 ^a	-0.718 ^a	-0.719 ^a	-0.713 ^a	-0.722 ^a	-0.672 ^a	-0.712 ^a
	(-8.32)	(-8.42)	(-8.41)	(-8.38)	(-8.30)	(-8.47)	(-7.62)	(-8.42)
Lagged (Cash Flow / Total Assets)	0.324 ^a	0.326 ^a	0.329 ^a	0.320 ^a	0.327 ^a	0.327 ^a	0.255 ^a	0.277 ^a
	(3.77)	(3.83)	(3.83)	(3.74)	(3.81)	(3.81)	(2.91)	(3.16)
Lagged Sales Growth	0.031 ^a	0.031 ^a	0.030 ^a	0.031 ^a	0.031 ^a	0.031 ^a	0.031 ^a	0.034 ^a
	(3.96)	(3.89)	(3.79)	(3.91)	(3.96)	(3.83)	(3.69)	(4.16)
Lagged Volatility of Cash Flow / Total Assets	0.438 ^a	0.396 ^a	0.434 ^a	0.437 ^a	0.454 ^a	0.433 ^a	0.467 ^a	0.493 ^a
	(3.01)	(2.75)	(2.98)	(3.00)	(3.12)	(2.99)	(2.97)	(3.29)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,169	55,169	55,169	55,169	55,169	55,169	55,169	55,169
Adjusted R ²	0.148	0.152	0.156	0.154	0.152	0.156	0.154	0.154

Note: This table presents the results of regressions of the value of cash holdings on EPU and government quality. The full sample includes 73,828 firm-years consisting of 12,607 unique publicly traded firms from 19 countries between 1988 and 2015. Excess cash is measured as the residual of baseline regression specification (1) in Table 3 excluding EPU. Tobin's Q is market value of equity plus total assets less book value of equity, all divided by total assets. All regressions include firm and year fixed effects. We winsorize all financial variables at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively

TABLE A4
The Role of Investor Protection

	Dependent variable: Ln(Cash/Net Assets)	
	(1)	(2)
Lagged EPU	-0.059 ^a (-4.125)	-0.056 ^a (-3.949)
Common Law	-0.766 ^a (-32.082)	
Revised Anti-director Index		-0.243 ^a (-35.828)
Size	-0.239 ^a (-30.275)	-0.221 ^a (-28.416)
Leverage	-1.988 ^a (-35.995)	-1.974 ^a (-35.631)
Net Working Capital / Net Assets	-0.510 ^a (-12.827)	-0.514 ^a (-12.898)
Operating Income / Net Assets	0.271 ^a (8.489)	0.270 ^a (8.426)
Sales Growth	0.022 ^a (3.929)	0.019 ^a (3.352)
Dividend Payer Dummy	0.088 ^a (6.329)	0.085 ^a (6.098)
Cash Flow Volatility	0.238 ^a (7.512)	0.237 ^a (7.433)
Capital Expenditures / Net Assets	1.466 ^a (17.348)	1.386 ^a (16.350)
R&D / Net Assets	1.717 ^a (14.037)	1.715 ^a (13.943)
Acquisitions / Net Assets	0.013 (0.169)	-0.037 (-0.485)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	73,828	73,828
Adjusted R-squared	0.144	0.145

Note: This table presents the results of regressions of cash holdings on EPU, investor protection, and their interactions. The main independent variable is the lagged EPU. The main dependent variable is the natural logarithm of Cash/Net assets. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE A5
The Adjustment of Cash Holdings

	Dependent variable: Δ Cash
	(1)
Lagged EPU	-0.004 ^a
	(-2.600)
Cash*-Lagged Cash	0.363 ^a
	(43.008)
Lagged EPU \times (Cash*-Lagged Cash)	-0.015 ^a
	(-4.239)
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	55,169
Adjusted R-squared	0.265

Note: This table presents the results of regressions of cash holding adjustments on EPU. The main independent variable is the lagged EPU. The main dependent variable is the change in cash holdings. Cash* is the predicted optimal cash level based on specification (1) without EPU. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

TABLE A6
Control for Lagged Cash Holdings

	Dependent variable: Ln(Cash/Net Assets)
	(1)
Lagged EPU	-0.053 ^a
	(-3.705)
Size	-0.286 ^a
	(-18.963)
Leverage	-1.175 ^a
	(-17.964)
Net Working Capital / Net Assets	-0.470 ^a
	(-10.790)
Operating Income / Net Assets	0.275 ^a
	(7.215)
Sales Growth	0.023 ^a
	(2.815)
Dividend Payer Dummy	0.035 ^b
	(2.571)
Cash Flow Volatility	0.127 ^a
	(3.046)
Capital Expenditures / Net Assets	0.292 ^a
	(2.761)
R&D / Net Assets	0.979 ^a
	(6.100)
Acquisitions / Net Assets	-0.691 ^a
	(-6.824)
Lagged Cash	0.332 ^a
	(35.199)
Firm Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	55,169
Adjusted R-squared	0.231

Note: This table presents the results of regressions of cash holdings on EPU and additional control for lagged cash holdings. The main independent variable is the lagged EPU. The main dependent variable is the natural logarithm of Cash/Net assets. All regressions include firm and year fixed effects. Financial variables are winsorized at the 1% level in both tails of the distribution. Variable definitions are provided in Appendix A. *t*-statistics based on robust standard errors clustered at the firm level are in parentheses below each coefficient. The notations ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.