Foreign competition and corporate cash holdings

College of Accountancy, Finance, and Economics, Birmingham City University, UK
Email: bijoychandra.das@bcu.ac.uk

Eric Ofosu-Hene
Leicester Castle Business School, De Montfort University, Leicester, UK.
Email: eric.ofosu-hene@dmu.ac.uk

Albert Danso*
Leicester Castle Business School, De Montfort University, Leicester, UK.
Email: Albert.danso@dmu.ac.uk

Emmanuel Adu-Ameyaw
Leicester Castle Business School, De Montfort University, Leicester, UK.
Email: emmanuel.adu-ameyaw@dmu.ac.uk

Moshfique Uddin
Leeds University Business School, University of Leeds, UK
Email: M.M.Uddin@leeds.ac.uk

*Coressponding author

Abstract

Purpose

This study investigates how foreign competition influences corporate cash holdings, an area that has received limited attention in the finance and management literature. It further explores how CEO characteristics and financial crises moderate this relationship.

Design/Methodology/Approach

Using a panel dataset of 2,451 U.S. firms from 2000 to 2020, we employ multivariate regression analyses to examine the relationship between foreign competition and corporate cash holdings. We also test for moderation effects using interaction terms and address potential endogeneity concerns with alternative specifications and robustness checks.

Findings

The results indicate that foreign competition has a positive and statistically significant effect on corporate cash holdings. This effect is more pronounced during periods of financial crisis, suggesting that firms facing foreign competition increase their cash buffers in times of economic uncertainty. Additionally, CEO characteristics significantly moderate the foreign competition–cash holding relationship.

Originality

This study extends the literature on corporate liquidity management by introducing foreign competition as a key determinant of cash holdings. It also contributes to the upper echelons perspective by highlighting how CEO attributes shape firm responses to external competitive pressures.

Keywords: Foreign competition, cash holdings, financial crisis, US

1.0 Introduction

Globalisation has intensified the competitive pressures faced by U.S. firms, yet we know

relatively little about how foreign competition shapes corporate financial policy. While prior research has extensively examined the determinants of cash holdings, including agency conflicts, financing frictions, and precautionary motives (Opler et al., 1999; Bates et al., 2009; Almeida et al., 2004), the role of foreign competitive pressure has remained underexplored. This paper addresses that gap by situating cash holding behaviour within a broader, globalised competitive landscape.

Indeed, the growing influence of foreign competition on corporate outcomes has become a central theme in the international business, finance, and management literature. Numerous studies highlight foreign competitive pressure as a key driver of strategic decisions such as acquisitions (Srinivasan, 2020), innovation (Xia and Liu, 2017; 2018), and corporate diversification (Bowen and Wiersema, 2005). Although this body of work demonstrates substantial knowledge accumulation on how foreign competition shapes firm behaviour, its implications for corporate cash holdings remain comparatively underexamined. Finance scholars have identified several economic motives for holding cash, ranging from the need to fund profitable investment opportunities (Cunha and Pollet, 2019) to agency-driven incentives that may encourage managers to retain excess liquidity. While Modigliani and Miller's (1958) frictionless framework implies indifference toward cash levels, real-world frictions render cash management a central feature of corporate policy. Since the early 2000s, the literature has increasingly emphasised precautionary motives, alongside other determinants such as debt capacity, derivatives usage, and access to credit lines (Almeida et al., 2004). Yet despite these advances, the empirical significance of foreign competition in explaining firms' cash holding behaviour remains largely overlooked, a gap that motivates the present study.While prior studies have provided insight on various rationales for corporate cash-holding, there has been a comparatively less research on how foreign competition drives corporate cash-holdings.

Although recognised as useful for improving efficiency, firms facing foreign competition may experience constraints in their cash flow. Driven by precautionary motives, such firms may scramble for liquidity because of the high uncertainty surrounding when and how much cash will be available for economic activities. By holding larger amounts of cash, firms are better equipped to cope with unexpected events. Kusnadi and Wei (2011) note that firms tend to save cash in anticipation of financial constraints so that they can invest when opportunities arise. Foreign competition may therefore serve as a powerful force, prompting firms to strengthen their cash reserves in order to retain a competitive edge and navigate an increasingly dynamic global business environment. The presence of foreign competitors heightens uncertainty and

volatility, demanding a strategic response from domestic firms. Holding larger cash reserves allows firms to respond effectively to changing market conditions, remain agile, and maintain their position amidst fierce global competition.

This study investigates how foreign competition influences corporate cash holdings and examines the role that CEO characteristics play in shaping this relationship. Building on the trade-off theory of cash holdings, which balances benefits and opportunity costs (Baumol, 1952; Xu et al., 2016), we argue that CEO traits are strategically important in determining a firm's cash management approach (Hambrick and Mason, 1984).

Using panel data from 2,451 U.S. firms over 2000–2020, our findings reveal that foreign competition significantly increases firms' cash holdings. Firms facing intense foreign rivalry tend to hold more cash as a precautionary measure against market uncertainties. We also find that male CEOs hold more cash than female CEOs under competitive pressure. Additionally, CEOs with shorter tenures hold more cash than longer-tenured CEOs, although CEO tenure does not significantly moderate the relationship between foreign competition and cash holdings.

Our study contributes to the corporate cash holdings and product market competition literatures in three ways. First, we show that foreign competition is an economically significant determinant of corporate cash holdings, functioning as an external force that compels firms to adjust their liquidity buffers. Second, we demonstrate that CEO characteristics systematically influence how firms respond to such pressures, extending the upper-echelons perspective into the domain of liquidity management under globalisation. Third, we reveal that the relationship between foreign competition and cash holdings intensifies during crisis periods, highlighting the interaction between global shocks and firm-level financial resilience.

Together, these contributions integrate product market competition, managerial decision-making, and systemic crises into the cash holdings literature, offering both theoretical insights and practical implications for managers and policymakers. In doing so, we provide new evidence on how globalisation interacts with crisis conditions to alter the liquidity trade-off. Our findings underscore the importance of managerial traits in shaping firm responses to global competition and offer novel evidence for investors and policymakers concerned with the financial and competitive resilience of U.S. firms.

The rest of this paper is structured along these lines: section 2 reviews related literature. Section 3 considers data and empirical methods. Section 4 presents and discusses results, and, finally, section 5 concludes the study.

2.0 Literature and hypotheses development

2.1. Theoretical basis

The rationale behind firms holding cash has been established in the existing literature. Early studies show that firms may hold cash for transaction motives (Baumol, 1952; Miller & Orr, 1966). For example, Baumol (1952) argues that firms that hold more cash can reduce transaction costs because they are able to avoid raising external funds frequently or prevent liquidating firm's assets to meet their operational needs. Following this, scholarly research have proffered different views including agency cost motive (Jensen, 1986; Pinkowitz et al., 2006; Dittmar and Mahrt-Smith, 2007; Harford, Mansi & Maxwell, 2008), precautionary motive (Bates et al., 2009; Opler et al., 1999), financial constraint motive (Kim, Mauer, & Sherman, 1998; Almeida et al., 2004; Denis & Sibilkov, 2010), refinancing risk and speculative motive (Harford, Klasa & Maxwell, 2014; Francis et al., 2014), diversification motive (Duchin, 2010; Tong, 2011), political uncertainty (Xu et al., 2016; Hassan et al., 2022), corporate governance and CEO belief (Kuan et al., 2012; Dittmar et al., 2003; Deshmukh et al., 2021), corporate social responsibility and customer relationship (Cheung, 2016; Itzkowitz, 2013) among others[1]. Jensen (1986) argues that unmonitored and entrenched managers may misuse firms' cash reserves by investing in unprofitable projects. Supporting this view, Dittmar and Mahrt-Smith (2007) and Harford, Mansi, and Maxwell (2008) provide empirical evidence showing that managers in poorly governed firms tend to accumulate large cash holdings for their private benefits, often spending on low-return investments. One way to mitigate this problem is by strengthening shareholder rights, as suggested by Pinkowitz, Stulz, and Williamson (2004).

Alternatively, many studies attribute cash holdings to the need for financial flexibility and protection against unexpected shocks. Bates et al. (2009) find that U.S. firms accumulate cash to buffer against financial distress caused by adverse cash flow shocks. Opler et al. (1999) similarly argue that firms facing information asymmetry hoard cash to avoid missing growth

---

[1] supply chain (Nguyen et al., 2021), the firm life cycle (Dittmar and Duchin, 2011), the tax motive (Foley et al., 2007), employee welfare (Ghaly, Dang, & Stathopoulos, 2015)

opportunities. Almeida et al. (2004) further show that financially constrained firms hold more cash to ensure they can invest in positive net present value projects without relying heavily on costly external financing. Denis and Sibilkov (2010) confirm this, finding that greater cash reserves among constrained firms increase firm value.

Other research highlights cash holdings as a tool to mitigate refinancing risk. Harford, Klasa, and Maxwell (2014) document that firms holding more cash face lower refinancing risk and enjoy higher valuations. Francis et al. (2014) observe that following interstate banking deregulation in the United States, firms reduced their cash holdings due to easier access to external finance. More recent studies emphasise the role of political and geopolitical risks in cash management. Xu et al. (2016) find that Chinese firms hold less cash when new government officials take office but increase cash holdings in politically risky environments, a pattern echoed by Hassan et al. (2022). Lee and Wang (2021) also report that firms exposed to geopolitical risks, particularly those that are financially constrained (Kotcharin and Maneenop, 2020), tend to hold more cash.

Another important stream of research explores the impact of import competition on various firm policies (e.g., Srinivasan, 2020; Xia and Liu, 2018; Xu, 2012). Empirical studies have identified several key effects, including innovation, imitation, and risk reduction (Xia and Liu, 2018); labour market outcomes such as wages and employment (Acemoglu et al., 2016; Autor, Dorn, and Hansen, 2013); corporate restructuring (Srinivasan, 2020; Bowen and Wiersema, 2005; Kang and Shivdasani, 1997); and financial policies including leverage and dividend payouts (Hoberg, Phillips, and Prabhala, 2014; Xu, 2012; Grullon and Michaely, 2007).

Drawing on resource dependence theory, Xia and Liu (2018) show that Chinese private high-tech firms reduce innovation efforts when facing foreign competition. Similarly, Autor et al. (2013) document that rising Chinese import competition suppresses innovation among U.S. firms, accompanied by declines in sales, profitability, R&D, and employment. Labour market effects are highlighted by Autor et al., (2013), who find that increased Chinese imports contribute to higher unemployment, lower labour force participation, and reduced wages in affected industries. Acemoglu et al. (2016) further confirm these findings in U.S. manufacturing. Regarding corporate responses, Srinivasan (2020) reports that domestic firms

are more likely to pursue acquisitions under foreign competition threats, while Bowen and Wiersema (2005) find reduced diversification strategies in import-competitive markets. Financially, studies document mixed effects of import competition on firm leverage and payout policies (e.g., Hoberg et al., 2014; Xu, 2012).

We integrate the trade-off theory of cash holdings with resource dependence theory to explain why foreign competition increases precautionary liquidity needs. Foreign entrants reduce domestic firms' control over resources, compelling them to rely more heavily on internal liquidity buffers. This mechanism differs from domestic rivalry because it stems from exogenous shocks such as globalisation and trade policy (Autor et al., 2013). Moreover, drawing on upper echelons theory (Hambrick and Mason, 1984), we argue that CEO characteristics shape these responses. For instance, powerful or entrenched CEOs may prefer to hoard cash as an exercise of strategic discretion (Chen et al., 2012), while gender and tenure reflect differences in risk tolerance and agency behaviour.

Despite these advances, limited research has addressed how foreign competition affects firms' cash holding decisions. Our present paper fills this gap knowledge by investigating whether firms strategically stockpile cash when faced foreign competition.

2.2. Foreign competition and corporate cash holdings

Firms employ various strategies to withstand industry shocks and remain competitive. These include restructuring through acquisitions, diversification, and downsizing (Srinivasan, 2020), as well as accumulating precautionary cash reserves (Bates, Kahle, and Stulz, 2009; Lins, Servaes, and Tufano, 2010). Lins et al. (2010) show that firms often hold cash beyond operational needs to cushion against unexpected disruptions. In industries characterised by intense foreign competition, market volatility can compress profit margins, making it strategically vital for firms to stockpile cash.

First, financially strong firms can deploy competitive strategies such as acquiring efficient distribution networks, hiring experienced talent, and engaging in targeted advertising (Campello, 2006). Second, cash-rich firms can boost productivity (Pavcnik, 2002) and adopt aggressive pricing strategies to reduce price–cost margins, thereby weakening financially constrained competitors (Katics and Petersen, 1994; Bolton and Scharfstein, 1990). Third, firms may use cash reserves as a pre-emptive tool to deter new entrants or signal competitive

strength, thereby influencing rivals' expansion decisions (Benoit, 1984). In foreign-dominated markets where competition is particularly intense, incumbents may be compelled to enhance efficiency in order to survive (Claessens et al., 2001; Walter and Gray, 1983). Cash holdings can offer a strategic advantage by enabling timely investment in growth and protecting market share (Fresard, 2010). Moreover, since external financing tends to be more costly in highly competitive markets (Valta, 2012), firms may rely more heavily on internal liquidity. Consequently, we expect that heightened foreign competition will lead firms to increase their cash holdings as both a defensive and a strategic response.

The corporate cash holdings literature emphasises the precautionary motive, whereby firms accumulate liquidity to buffer cash flow volatility (Opler et al., 1999; Bates et al., 2009). Other studies highlight the role of financing frictions, noting that heightened competition can tighten access to external finance by increasing debt costs and prompting greater reliance on internal liquidity to maintain flexibility (Almeida et al., 2004; Valta, 2012). Finally, cash holdings can serve as a form of financial strength, allowing firms to withstand competitive pressure, engage in aggressive pricing, or invest quickly when rivals weaken (Bolton and Scharfstein, 1990; Fresard, 2010).

Foreign competition is measured at the industry level, following prior studies (Bowen and Wiersema, 2005; Valta, 2012; Xia and Liu, 2018). This approach captures competitive pressure from foreign entrants in U.S. product markets, which all firms in an industry, whether multinational or purely domestic, must face. Even firms without foreign operations are exposed to import penetration and the ensuing erosion of domestic market share. For example, Autor, Dorn and Hanson (2013) demonstrate that rising Chinese import competition significantly affected U.S. manufacturing employment and profitability, including firms operating solely within domestic markets. Thus, our measure does not suggest that all firms are equally exposed to international financial risks such as currency fluctuations or repatriation taxes, but rather that they face competitive pressures arising from globalisation within their domestic markets.

Foreign competition represents a distinctive competitive context. Unlike domestic rivalry, which evolves endogenously, import penetration is frequently driven by exogenous shocks such as foreign productivity growth, exchange rate movements or trade liberalisation (Autor et al., 2013). Foreign entrants reduce incumbents' market share directly while simultaneously intensifying domestic rivalry, creating multi-layered pressures on firms. Consequently, foreign

competition amplifies the classic channels through which cash becomes both a strategic and a precautionary asset.

H1: *Firms exposed to higher foreign competition hold more cash relative to less-exposed firms.*

2.3. Foreign competition, CEO attributes and corporate cash holding

The firm's chief executive officer (CEO) is appointed by shareholders to make value-enhancing, yet often risky, decisions on their behalf. Prior research indicates that powerful, entrenched CEOs tend to prefer less risky policies to protect their positions, with one common approach being to hold larger cash reserves (Chen et al., 2012; Dittmar and Mahrt-Smith, 2007). Product market competition can significantly influence a CEO's risk appetite. For example, a CEO operating in an industry with many foreign competitors may opt for either a conservative or aggressive strategy. A conservative approach may ensure the firm's short-term survival but risks long-term decline as rivals with more aggressive strategies capture market share.

Aggressive firms with strong cash holdings can invest in competitive advantages such as hiring skilled workers, implementing aggressive pricing, launching targeted advertising, or acquiring superior distribution channels, thereby threatening incumbents. Management literature suggests that entrenched CEOs-measured by factors like CEO duality, tenure, ownership, and founder status-often pursue self-serving agendas when granted unchecked power (Zhang et al., 2016). One such behavior is using excess cash on value-decreasing activities. Supporting this, Harford et al. (2008) find that firms with weaker governance structures tend to allocate larger portions of cash to acquisitions that create less value, implying that poorly governed firms with ample cash reserves frequently make inefficient spending decisions.

This tendency may intensify in fiercely competitive markets. Since CEOs' job security and reputations depend on the firm's survival-and failure to compete can lead to loss of market share-managers might take greater risks despite minimal financial incentives (Bakke et al., 2022). Additionally, large unused cash reserves can provoke shareholder unrest[2], increasing the risk of managerial turnover (Faleye, 2004). We therefore argue that entrenched CEOs with

---

[2] Kerkorian's 1995 tender offer for Chrysler was explicitly to be partly financed by the $8 billion in cash reserves that Chrysler had accumulated. Because U.S. law allows the debt of an acquiring shareholder to be assigned to the acquired company, this is possible.

substantial power may hoard cash strategically to fuel competitive initiatives amid rising foreign competition. Based on these arguments, we test the following two hypotheses:

H2: *The positive relation between foreign competition and corporate cash holding is likely to be accentuated when the CEO holds a dual role (CEO duality).*

H3: *The positive relation between foreign competition and corporate cash holding will be more pronounced for long-tenured CEO.*

According to the social role theory as proposed by Franke et al. (1997), males are known to display more "agentic behaviour," characterized by qualities such as independence, assertiveness, and competence, in comparison to their female counterparts. These distinct traits can potentially impact decision-making processes of individual managers, particularly in competitive environments where companies strive for survival. Considering these differing traits, it is plausible to assume that male CEOs might possess the necessary drive, such as confidence, resilience, and skills, to effectively compete in markets that are saturated with foreign products. As a result, it becomes more likely for male CEOs to accumulate cash reserves when facing increased competition from foreign rivals.

H4: *The positive relation between foreign competition and cash holding is likely to be enhanced when the CEO is a male.*

3.0 Data and method
3.1. Data

We investigate the relation between the corporate cash holdings and foreign competition in this paper. The samples are constructed from the financial, subsidiary, executive and stock data obtained from WRDS. Hence, we consider the foreign competition and corporate cash holdings for all the US firms over the period 2000-2020. We obtain the firm-level financial data from Compustat, CEO characteristics data from ExecuComp, and stock price data from CRSP. Our samples focus on 51471 firm-year observations reflecting firms from different sectors. Of these all observations, 27686 observations are for multinational firms, and others are domestic firms. We exclude the observations with missing values of the considered variables in the regressions. We winsorize all the continuous variables at the 1st and 99th percentiles to alleviate the probable impact of outliers on the results. We drop those firms from our analysis with missing values in

dependent and independent variables in one year. The final samples consist of 51471 firm-year observations for 2451 unique firms.

3.2. Dependent variable

Following, Ghaly et al. (2015); Cheung (2016); Acharya et al. (2013); Palazzo (2012), we measure the corporate cash holdings as cash and marketable securities deflated by total assets, the dependent variable in our study. Consistent with prior studies on corporate cash holdings (Opler et al., 1999; Bates et al., 2009), we measure liquidity as the ratio of cash and marketable securities to total assets. This standard proxy allows comparability with the established literature. While alternative measures such as cash-to-sales may provide complementary insights, we focus on cash-to-assets to maintain consistency with existing empirical work.

3.3. Independent Variables
Measuring foreign competition
The first key explanatory variable reflects the foreign competition across the multiple firms of different sectors. Foreign competition is measured by using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector (Xia and Liu, 2018).

$$\text{Concentration Ratio } (CR_n) = MS_1 + MS_2 + MS_3 + \ldots + MS_n$$

Where, MS_n is the market share of the nth firms, $n = 1, 2, 3, \ldots, 8$; the lower the concentration ratio indicates the higher level of foreign competition. We consider the inverse measure of concentration ratio $(1 - CR_n)$ where a higher value indicates greater foreign competition (Bowen and Wiersema, 2005).

We measure foreign competition using concentration ratios (FCOM3/FCOM4/FCOM6), defined as the total market share of the largest foreign firms in each sector. This approach follows prior studies that employ concentration-based proxies to capture industry-level competitive pressure (Valta, 2012; Hoberg et al., 2014). Concentration ratios provide a transparent and tractable way to quantify the dominance of foreign rivals across industries and are consistent with established measures of market structure in corporate finance research.

3.4. Control variables

In line with the existing literature (see e.g., Anderson and Hamadi, 2016; Bates et al., 2009), we control for a number of firm-level factors that are likely to impact cash holdings. These variables include firm size (SIZE), firm age (FAGE), Tobin's Q (TQ), book leverage (LEV), dividend (DIV), Capital expenditure (CAPEx), return on assets (ROA), earnings volatility (EVOL), assets tangibility (TANG), financial constraints (CONST) and stock return volatility (VOL). We also control for a number of CEO characteristics, including CEO duality (DUAL), CEO age (Age), CEO gender (GEND), CEO tenure (TENU), CEO compensation (COMP) and CEO optimism (HOL67). Definitions of all the variables used in this study are presented in Appendix Table 1.

The choice of control variables follows the corporate cash holdings literature and is grounded in established theoretical rationales. Firm size and firm age are included to capture life cycle and transaction cost considerations, as larger and older firms typically have easier access to external financing. Tobin's Q proxies growth opportunities, since firms with valuable investment options tend to maintain higher liquidity. Book leverage reflects financial constraints, as highly levered firms face higher costs of external funding and may either hoard or reduce cash depending on refinancing risks. Dividend payments and capital expenditure capture payout and investment policies that directly influence available liquidity. Profitability (ROA) and measures of earnings and stock return volatility are linked to precautionary motives, as firms with volatile cash flows hold larger liquidity buffers to guard against financial shocks. Asset tangibility proxies collateral availability and access to debt markets, thereby influencing reliance on internal liquidity.

In addition to these firm-level factors, we include CEO characteristics such as tenure, duality, compensation and optimism, which are grounded in the agency and upper echelons literatures (Hambrick and Mason, 1984; Chen et al., 2012; Dittmar and Mahrt-Smith, 2007). These managerial attributes capture heterogeneity in risk preferences and governance structures that can shape cash holding policies. Taken together, this comprehensive set of controls ensures that our estimated effect of foreign competition on cash holdings is not confounded by other firm-specific or managerial determinants emphasised in prior research.

To address potential concerns about differences between multinational and domestic firms, we explicitly distinguish the two groups in our analysis. Of the 51,471 firm-year observations, 27,686 correspond to multinational firms and the remainder to domestic-only firms. This distinction allows us to examine whether the effect of foreign competition on cash holdings is

concentrated among multinationals or whether domestic firms also adjust their liquidity policies when foreign entrants intensify industry competition.

3.5. Estimation method

Following prior research (Duong et al., 2020; Cheung, 2016), the baseline regression models for panel data take the following form:

$$CASH_{it} = \alpha + \beta_1 FCOM3_{it} + \vartheta\, Controls_{it-1} + \mu_i + \mu_t + \varepsilon_{t+1} \tag{1}$$

Where $CASH_{it}$ is cash holdings for firm i at time t. $FCOM3_{it}$ is the foreign competition, and $Control_{it}$ is a vector of control variables that includes *DUAL, AGE, GEND, TENU, COMP, HOL67, SIZE, TQ, ROA, BLEV, EVOL, DIV, TANG, VOL, and FAGE*. μ_i and μ_t are the sector-specific and time-fixed effects, respectively. We expect all coefficients of foreign competitions to take the positive sign.

4.0 Results and discussion

4.1. Descriptive statistics and bivariate correlations

Table 2 presents descriptive statistics for the sample, comprising 50,883 firm-year observations. The mean (median) cash holdings (CASH) is 0.15 (0.08), consistent with prior findings (Bates et al., 2009). CASH ranges from 0.00 to 0.80. The mean (median) of foreign competition variables are as follows: FCOM3 is 0.61 (0.63), FCOM4 is 0.16 (0.04), and FCOM6 is 2.17 (2.56). Table 3 reports the pairwise correlation matrix. CASH is positively correlated with FCOM3 (0.111), FCOM4 (0.029), and FCOM6 (0.074), all significant at the 1% level. FCOM3 is positively correlated with FCOM4 but negatively with FCOM6, suggesting FCOM4 and FCOM6 may act as substitutes in explaining cash holdings in the U.S. market. No pairwise correlation exceeds the 0.80 threshold for multicollinearity concerns (Berry et al., 1985). Figures 1 displays average competition levels by SIC sector for domestic and foreign firms.

Table 2: Summary Statistics

This table presents the summary statistics for cash holdings and foreign competition. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020.

Variables	N	Mean	SD	Median	Max	Min	P25	P75
CASH	39848	0.15	0.18	0.08	0.80	0.00	0.03	0.22
FCOM3	50883	0.61	0.15	0.63	0.97	0.00	0.56	0.68
FCOM4	50883	0.16	0.23	0.04	0.99	0.00	0.00	0.22
FCOM6	50883	2.17	0.76	2.56	2.85	0.30	1.67	2.68
SIZE	39848	7.63	1.88	7.60	12.32	-6.91	6.37	8.87
TQ	39854	0.82	0.63	0.72	4.36	-11.57	0.47	0.96
ROA	39848	0.10	0.24	0.11	0.43	-28.40	0.04	0.16
LEV	39854	0.16	0.19	0.09	0.80	-2.93	0.00	0.24
VOL	28414	0.04	0.05	0.02	0.34	0.00	0.01	0.04
DIV	50883	0.42	0.49	0.00	1.00	0.00	0.00	1.00
CAPx	34246	-0.04	0.43	0.00	0.36	-36.52	-0.04	0.04
TANG	39848	0.82	0.20	0.91	1.00	0.05	0.71	0.99
CONST	39848	0.00	0.00	0.00	0.03	0.00	0.00	0.00
VOL	50883	0.07	0.08	0.06	0.39	0.00	0.00	0.11
FAGE	39845	2.27	0.81	2.48	3.71	0.00	1.79	2.83
DUAL	31607	0.84	0.37	1.00	1.00	0.00	1.00	1.00
AGE	29957	3.96	0.18	3.99	4.29	2.40	3.89	4.06
GEND	31607	0.95	0.22	1.00	1.00	0.00	1.00	1.00
TENU	31368	2.16	0.77	2.20	3.64	0.00	1.61	2.71
COMP	31207	8.71	1.21	8.80	11.10	-6.91	7.95	9.55
HOL67	21585	0.58	0.49	1.00	1.00	0.00	0.00	1.00
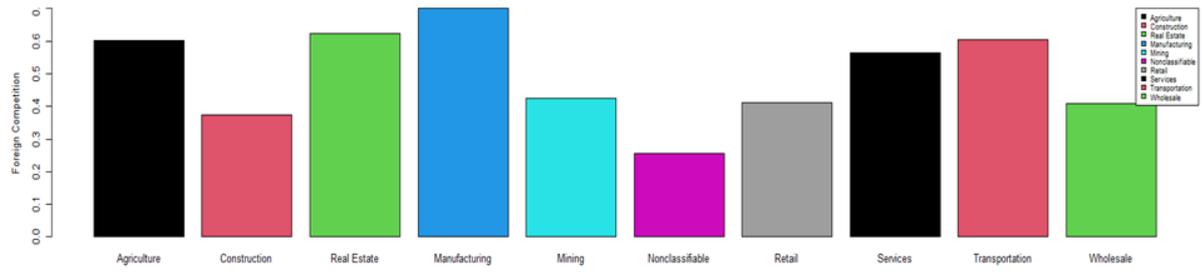
Figure 1: Average competition levels by sector

Table 3: Correlation Matrix

This table presents the correlation matrix for all variables. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, ** and * represent the statistical significance levels for 1%, 5% and 10%, respectively.

	CASH	FCOM3	FCOM4	FCOM6	DUAL	AGE	GEND	CONS	TENU	COMP	HOL67	SIZE	TQ	ROA	BLEV	EVOL	DIV	CAPx	TANG	VOL	FAGE
CASH	1																				
FCOM3	.111***	1																			
FCOM4	.029***	.032***	1																		
FCOM6	.074***	-.115***	.369***	1																	
DUAL	-.061***	.032***	.006	.046***	1																
AGE	-.075***	.030***	-.023***	.075***	.055***	1															
GEND	-.009	.043***	.030***	-.023***	.030***	.012	1														
CONST	-.166***	-.039	.097***	.150***	.102***	.092***	.015**	1													
TENU	.059***	-.026**	.006***	.009***	.099***	.121***	.076***	.070***	1												
COMP	-.061***	.062***	-.001	.055	-.046***	.134***	-.047***	-.122***	-.155***	1											
HOL67	-.024***	.066***	-.008***	-.016**	.004	-.018	.000	.058***	-.027***	-.007	1										
SIZE	-.373***	.039***	.044***	.079***	.046***	.109***	.000**	.243***	-.134***	.553***	.077***	1									
TQ	-.316***	-.053***	.060***	-.026**	.002***	.008***	.000	.218***	-.124***	-.059***	.129***	.188***	1								
ROA	.039***	.017	-.252***	-.182***	-.047***	-.011	-.028***	-.289***	-.030***	.136***	-.101***	-.056***	-.358***	1							
BLEV	-.320***	-.010***	-.032***	-.102***	-.049***	-.006	.022***	-.370***	-.119***	.183***	-.003	.147***	.265***	.029***	1						
EVOL	.445***	.039***	-.086***	-.054***	-.103***	-.065	.017***	-.342***	.009***	-.123***	-.017***	-.474***	-.225***	.201***	-.044***	1					
DIV	-.285***	.076***	-.017***	-.040***	.070***	.119***	.002*	.151***	-.029***	.206***	.057***	.416***	-.007***	.048***	-.023***	-.304***	1				
CAPx	-.114	-.085	-.026***	-.033***	-.002	.011	-.011***	.030***	.030***	.006***	-.058***	.052***	-.055***	.140***	-.080***	-.010	.081***	1			
TANG	.028***	-.097***	.148***	.088***	.048***	.019**	-.003	.212***	.092***	-.193***	.022***	-.058***	.114	-.269***	-.222***	-.017***	.079***	.382***	1		
VOL	.044***	.047***	-.048***	-.080***	.027	.053***	.026***	-.047***	.014	.049*	.097***	-.020***	-.238***	.025***	-.069***	.102***	.145***	-.009***	.043***	1	
FAGE	.014	.109***	-.032***	.146***	.048***	.167***	.012	-.059***	-.015	.246***	.060***	.183***	-.157***	.046***	.016***	-.006***	.226***	-.070***	-.082***	.246***	1

4.2. Foreign Competition and cash holdings

Table 4 presents the regression results based on Equation (1), using Ordinary Least Squares (OLS) as the baseline method. Column (1) and Column (4) show the pooled regression results, while Columns (2) through (7) include fixed effects. The dependent variable is cash holdings ($CASH_{it}$), and the main independent variable is foreign competition ($FCOM3_{it}$).

In Column (1), shows the regression result of $CASH_{it}$ on $FCOM3_{it}$ without control variables, the coefficient on $FCOM3_{it}$ is positive (0.069) and both economically and statistically significant at the 1% level. This suggests a positive relationship between foreign competition and cash holdings. In Column (2), we add control variables along with year and sector fixed effects. The coefficient on $FCOM3_{it}$ remains positive and significant (0.029), confirming the earlier result. Columns (3) to (7) continue to show similar results, even after adding year, sector, firm-level controls, and CEO-specific characteristics even when we use fixed effect model (4-7). This consistent pattern suggests that higher foreign competition is associated with a 2.90% increase in average cash holdings.

Table 4 show that foreign competition has a positive and statistically significant effect on corporate cash holdings. Beyond statistical significance, the magnitude of this effect is economically meaningful. A one standard deviation increase in FCOMP3 translates into approximately a 2.9 percentage point rise in the cash-to-assets ratio. To put this in perspective, this increase is comparable in size to the effects of key determinants highlighted in the prior literature, such as dividend payouts or leverage (Opler et al., 1999; Bates et al., 2009; Almeida et al., 2004). This demonstrates that foreign competition is not only a statistically detectable factor but also a substantively important driver of liquidity policies.

We also find that variables such as EVOL, TANG, VOL, and FAGE have positive and significant effects on cash holdings. In contrast, SIZE, TQ, ROA, BLEV, and DIV show negative but significant coefficients. For CEO-specific characteristics, we observe mixed results: DUAL, AGE, and HOL67 have negative significant coefficients, while TENU and COMP are positive and significant. Column (4) reports the regression without year and sector fixed effects. Overall, the above findings suggest that cash holding is positively related with foreign competition, thus offering support for our hypothesis 1.

1

Table 4: Baseline Regression: Foreign Competition on Cash

This table presents the baseline regression results. CASH is the dependent variable, and FCOM3 is the independent variable. Column (1) estimates the results for all the observations without year, and sector fixed effects, column (2) estimates the results with sector fixed effects, and columns (3)-(7) estimate the results with year and sector fixed effects. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

Variables	Dependent Variable: Cash						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FCOM3	0.069***	0.029***	0.029***	0.124***	0.124***	0.029***	0.029***
	(0.005)	(0.007)	(0.008)	(0.005)	(0.005)	(0.008)	(0.008)
DUAL			-0.008***	-0.005***	-0.005***	-0.005***	-0.008***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
AGE			-0.040***	-0.038***	-0.038***	-0.040***	-0.040***
			(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
GEND			0.001	-0.004	-0.004	0.001	0.001
			(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
TENU			0.006***	0.005***	0.005***	0.006***	0.006***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
COMP			0.017***	0.018***	0.018***	0.017***	0.017***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HOL67			-0.007***	-0.013***	-0.013***	-0.007***	-0.007***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
SIZE		-0.014***	-0.021***	-0.021***	-0.021***	-0.021***	-0.021***
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TQ		-0.004***	-0.007***	-0.009***	-0.009***	-0.004***	-0.007***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ROA		-0.027***	-0.024***	-0.028***	-0.028***	-0.024***	-0.024***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
BLEV		-0.239***	-0.233***	-0.267***	-0.267***	-0.233***	-0.233***
		(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
EVOL		0.829***	0.813***	0.785***	0.785***	0.813***	0.813***
		(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
DIV		-0.052***	-0.050***	-0.057***	-0.057***	-0.050***	-0.050***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CAPx		0.000	-0.014***	-0.022***	-0.022***	-0.014***	-0.014***
		(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
TANG		0.189***	0.213***	0.154***	0.154***	0.213***	0.213***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
VOL		0.034***	0.042***	0.022**	0.022**	0.042***	0.042***
		(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
FAGE		0.011***	0.009***	0.009***	0.009***	0.009***	0.009***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year effects	No	Yes	Yes	Yes	Yes	Yes	Yes

Sector effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	50,883	43,071	39,144	39,144	39,144	39,144	39,144
R^2	0.003	0.413	0.437	0.385	0.385	0.437	0.437

4.3. Robustness tests using alternative measures of foreign competition

We test the robustness of our baseline results by using alternative measures of foreign competition, as shown in Table 5. The table reports OLS regression results with year and sector fixed effects. The dependent variable is cash holdings ($CASH_{it}$), and the independent variables are alternative foreign competition measures: $FCOM4_{it}$ and $FCOM6_{it}$ These are used in place of $FCOM3_{it}$ to check the consistency of our main findings.

Column (1) shows results using CEO-specific control variables. The coefficient on $FCOM4_{it}$ is positive (0.020) and statistically significant at the 1% level. This means a 1% increase in foreign competition is associated with a 2.00% increase in cash holdings, even after accounting for CEO characteristics. Column (2) includes firm-level controls and fixed effects without CEO features. The coefficient on $FCOM6_{it}$ is also positive (0.038) and significant at the 1% level, supporting the positive relationship between foreign competition and cash holdings.

Columns (3) and (4) include both CEO-specific and firm-level control variables, along with fixed effects. The coefficients on FCOM4it (0.018) and FCOM6it (0.025) remain positive and statistically significant, confirming the robustness of our findings across different measures of foreign competition. Models (5) through (12), which also use fixed effects, show similar results, further supporting our earlier conclusions. The control variables produce patterns consistent with those reported in Table 4.

Overall, these findings suggest a positive association between cash holdings and foreign competition, consistent with our baseline regression results. As noted earlier, this study contributes to the existing literature, which has largely examined cash holdings and foreign competition separately (e.g., Anderson and Hamadi, 2016; Duong et al., 2020; Xu et al., 2016; Cheung, 2016; Xia and Liu, 2018; Bowen and Wiersema, 2005).

The robustness tests using alternative measures of foreign competition (Table 5) confirm this result. Both FCOMP4 and FCOMP6 yield positive and significant coefficients, with effect sizes between 2–3% of total assets, underscoring that the observed relationship is not sensitive to how competition is measured. This consistency across multiple operationalizations aligns with the theoretical view that import penetration intensifies uncertainty in product markets, thereby strengthening precautionary motives for cash accumulation.

Furthermore, the pattern of results for control variables reinforces the validity of our findings. Firms with higher earnings volatility and less tangible assets hold more cash, consistent with the precautionary and financing-friction hypotheses. Conversely, firms that are larger, more profitable, or pay dividends tend to hold less cash, which is in line with earlier empirical evidence (Bates et al., 2009; Denis & Sibilkov, 2010). By showing that foreign competition effects remain significant even after controlling for these well-established determinants, our results highlight foreign competition as an additional, previously underexplored channel shaping cash-holding behavior.

Table 5: Foreign Competition on Cash: Alternative measures

This table presents the regression results for the alternative measurements of foreign competition on cash holdings. CASH is the dependent variable, and FCOM4 and FCOM6 are the independent variables. Column (1) estimates the results with year and sector fixed-effects, column (2) estimates the results with year and sector fixed effects, and columns (3)-(5) estimate the results with firm-level and CEO-specific controls. Column (7) estimates the results with year and sector fixed-effects, column (8)-(10) and (12) estimate the results with year and sector fixed effects, and columns (11) estimates the results without year and sector fixed-effects. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

Variables	Dependent Variable: Cash											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FCOM4	0.020***		0.018***		0.021***		0.023***		0.021***		0.021***	0.021***
	(0.004)		(0.003)		(0.003)		(0.004)		(0.003)		(0.003)	(0.003)
FCOM6		0.038***		0.025***		0.024***		0.026***		0.024***	0.024***	0.024***
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	(0.001)	(0.001)
DUAL	-0.017***		-0.008***	-0.005**	-0.008***	-0.008***	-0.020***		-0.010***	-0.007***	-0.010***	-0.010***
	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)
AGE	-0.056***		-0.039***	-0.039***	-0.039***	-0.039***	-0.057***		-0.041***	-0.041***	-0.041***	-0.041***
	(0.005)		(0.004)	(0.005)	(0.004)	(0.004)	(0.005)		(0.004)	(0.005)	(0.004)	(0.004)
GEND	-0.006*		0.000	-0.001	0.000	0.000	-0.003		0.004	0.005	0.004	0.004
	(0.004)		(0.003)	(0.003)	(0.003)	(0.003)	(0.004)		(0.003)	(0.003)	(0.003)	(0.003)
TENU	0.017***		0.006***	0.005***	0.006***	0.006***	0.015***		0.005***	0.004***	0.005***	0.005***
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
COMP	-0.017***		0.017***	0.019***	0.017***	0.017***	-0.016***		0.017***	0.018***	0.017***	0.017***
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
HOL67	-0.023***		-0.007***	-0.011***	-0.007***	-0.007***	-0.024***		-0.007***	-0.011***	-0.007***	-0.007***
	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)
SIZE		-0.014***	-0.021***	-0.026***	-0.021***	-0.021***		-0.015***	-0.022***	-0.027***	-0.022***	-0.022***
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
TQ		-0.004***	-0.007***	-0.009***	-0.007***	-0.007***		-0.004***	-0.007***	-0.009***	-0.007***	-0.007***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ROA		-0.027***	-0.024***	-0.029***	-0.024***	-0.024***		-0.025***	-0.022***	-0.028***	-0.022***	-0.022***
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
BLEV		-0.238***	-0.232***	-0.273***	-0.232***	-0.232***		-0.230***	-0.224***	-0.263***	-0.224***	-0.224***
		(0.004)	(0.005)	(0.005)	(0.005)	(0.005)		(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
EVOL		0.832***	0.815***	0.779***	0.815***	0.815***		0.811***	0.794***	0.753***	0.794***	0.794***
		(0.014)	(0.015)	(0.016)	(0.015)	(0.015)		(0.014)	(0.015)	(0.015)	(0.015)	(0.015)
DIV		-0.052***	-0.049***	-0.055***	-0.049***	-0.049***		-0.047***	-0.044***	-0.048***	-0.044***	-0.044***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CAPx		0.001	-0.014***	-0.021***	-0.014***	-0.014***		0.001	-0.012***	-0.019***	-0.012***	-0.012***
		(0.001)	(0.002)	(0.002)	(0.002)	(0.002)		(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
TANG		0.188***	0.212***	0.145***	0.212***	0.212***		0.182***	0.206***	0.140***	0.206***	0.206***
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
VOL		0.036***	0.043***	0.034***	0.043***	0.043***		0.036***	0.044***	0.036***	0.044***	0.044***
		(0.009)	(0.010)	(0.010)	(0.010)	(0.010)		(0.009)	(0.010)	(0.010)	(0.010)	(0.010)
FAGE		0.011***	0.009***	0.011***	0.009***	0.009***		0.010***	0.009***	0.011***	0.009***	0.009***
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year effects	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Sector effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Observations	45,318	43,071	39,144	39,144	39,144	39,144	45,318	43,071	39,144	39,144	39,144	39,144
R^2	0.134	0.413	0.438	0.376	0.438	0.438	0.156	0.423	0.446	0.387	0.446	0.446

4.4. Addressing potential endogeneity

Although we use a dynamic system GMM estimator (Blundell and Bond, 1998) to mitigate endogeneity, concerns about reverse causality and omitted variable bias may still remain. For example, cash-rich firms may attract foreign competitors rather than the reverse, or unobserved strategic orientations, such as internationalisation or risk management policies, may influence both exposure to competition and liquidity choices. To strengthen causal inference, we therefore conduct additional robustness checks using an instrumental variables (IV) approach via two-stage least squares. Following Autor et al. (2013) and Valta (2012), we instrument foreign competition with lagged foreign competition at the firm level. These instruments are plausibly exogenous to contemporaneous cash holdings while remaining strongly correlated with foreign competition. To further reduce endogeneity concerns, we use lagged firm-level variables as instruments and include year and sector fixed effects.

Table 6 reports the GMM estimation results. Column (1) includes the first lag of cash holdings without fixed effects, while Columns (2) and (3) introduce year and sector fixed effects, respectively. Column (4) incorporates both the first and second lags along with the full set of fixed effects. Across all specifications, the coefficients on lagged cash and foreign competition remain positive and statistically significant at the 1 per cent level, consistent with our baseline findings. The Sargan and Hansen tests confirm the validity of the instruments, indicating no over-identification concerns. Overall, the results indicate that foreign competition positively influences cash holdings, and our findings are robust to endogeneity concerns.

Table 6: Foreign Competition (FCOM3) on Cash: Two Step System GMM

This table presents the dynamic regression results. CASH is the dependent variable, and FCOM3 is the independent variable. Column (1) estimates the results without year, and sector fixed-effects, column (2) estimates the results with year fixed effect but not and sector, and columns (3)-(4) estimate the results with year and sector fixed effects. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Cash			
Variables	(1)	(2)	(3)	(4)
L.CASH	0.726***	0.731***	0.649***	0.604***
	(0.000)	(0.000)	(0.001)	(0.001)
L2.CASH				0.087***
				(0.001)
FCOM3	0.037***	0.037***	0.012***	0.007***
	(0.000)	(0.000)	(0.000)	(0.000)
DUAL	0.006***	0.006***	0.006***	0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
AGE	-0.005***	-0.008***	-0.007***	-0.009***

	(0.000)	(0.000)	(0.000)	(0.001)
GEND	-0.004***	-0.005***	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
TENU	-0.000	0.001***	0.002***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
COMP	0.002***	0.003***	0.002***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
HOL67	-0.004***	-0.004***	-0.001***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	-0.007***	-0.007***	-0.006***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
TQ	-0.007***	-0.006***	-0.006***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.046***	-0.043***	-0.051***	-0.042***
	(0.001)	(0.001)	(0.001)	(0.001)
BLEV	-0.070***	-0.068***	-0.080***	-0.070***
	(0.001)	(0.001)	(0.001)	(0.001)
EVOL	0.154***	0.155***	0.232***	0.191***
	(0.002)	(0.002)	(0.003)	(0.002)
DIV	-0.014***	-0.013***	-0.015***	-0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
CAPx	-0.066***	-0.064***	-0.056***	-0.055***
	(0.000)	(0.001)	(0.001)	(0.001)
TANG	0.087***	0.085***	0.113***	0.109***
	(0.000)	(0.000)	(0.001)	(0.001)
VOL	-0.003***	0.002**	0.006***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
FAGE	0.000	-0.000	0.001***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.027***	0.027***	-0.017***	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
N	37,280	37,280	37,280	35,416
N clust	1,864	1,864	1,864	1,864
CEO-specific controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes
Hansen p	0.797	0.837	0.915	0.862
Sargan p	0	0	0	0

Table 7 reports the results of our instrumental variables approach using two-stage least squares (2SLS). In the first stage, lagged values of foreign competition significantly predict current levels of FCOM3, confirming instrument relevance in line with Staiger and Stock (1994) and Stock and Yogo (2002). The second stage shows a consistently positive and statistically significant effect of foreign competition on firms' cash holdings. In the baseline model without controls, a one-unit increase in FCOM3 raises the cash by 2.788 percentage points. After including firm-level controls and fixed effects, the coefficient is 1.098 and remains highly significant, suggesting the effect is not driven by omitted variables or firm heterogeneity. These findings imply that firms facing greater foreign rivalry accumulate larger liquidity buffers, consistent with the precautionary motive (Opler et al., 1999; Bates et al., 2009) and resource dependence theory (Pfeffer & Salancik, 1978). The results extend prior evidence on domestic product-market competition (Valta, 2012; Hoberg et al., 2014) by showing that foreign competition - an exogenous globalization shock - also shapes liquidity management. In doing

so, our study complements agency-based perspectives on free cash flow (Jensen, 1986; Dittmar & Mahrt-Smith, 2007) and recent work linking managerial heterogeneity to cash policies (Chen et al., 2012), highlighting that cash holdings serve as both a strategic and precautionary resource under intensified global competition.

We further examine the validity of our IV strategy by conducting several diagnostic tests. First, the Kleibergen–Paap rk Wald F-statistics across all specifications are comfortably above the conventional threshold of 10, suggesting that our instruments are not weak (Staiger & Stock, 1997; Stock & Yogo, 2002). Second, the Hansen J-test of overidentifying restrictions yields p-values well above conventional significance levels, indicating that the exclusion restrictions are not rejected and the instruments are valid. Third, the endogeneity test strongly rejects the null hypothesis of exogeneity for FCOM3, which supports the use of an IV approach rather than OLS. Taken together, these diagnostics confirm that our instruments are relevant and valid, and they strengthen the causal interpretation of the relationship between foreign competition and cash holdings.

Table 7: Instrumental variables approach: Two-stage least squares (2SLS)

This table presents the instrumental variable approach. CASH is the dependent variable, and FCOM3 is the independent variable. Column (1) estimates the results without control variables and column (2)-(3) estimate the results with control variables and fixed effects. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

First Stage

Dependent Variable: Foreign Competition (FCOM3)

	(1)	(2)	(3)
L.FCOM3	0.163***		1.014***
	(0.018)		(0.321)
L2.FCOM3		0.049***	
		(0.022)	
Observations	37,280	37,280	37,280
Control Variables	No	Yes	Yes
Fixed Effects	Yes	Yes	Yes
Kleibergen–Paap F	23.3	19.2	16.4

Second Stage

Dependent Variable: Cash

	(1)	(2)	(3)
FCOM3	2.788***	1.882***	1.098***
	(0.085)	(0.009)	(0 .215)
Observations	37,280	37,280	37,280

5

Control Variables	No	Yes	Yes
Fixed Effects	Yes	Yes	Yes
Hansen J (p-value)	0.27	0.37	0.39
Endogeneity Test (p-value)	0.01	0.03	0.03

Results from both Tables 6 & 7 confirm that our baseline findings are robust, alleviating concerns that cash-rich firms drive foreign competition or that omitted firm strategies bias the estimates.

4.5. Foreign competition, CEO attributes and corporate cash holding

As shown earlier, our first hypothesis (H1) confirms that firms tend to hold more cash when exposed to foreign competition. In this section, we further examine whether this relationship is influenced by specific CEO characteristics, as proposed in hypotheses H2, H3, and H4 (Section 2.3). Table 8 presents the OLS regression results with year and sector fixed effects to test these interactions.

Columns (1) and (2) explore the role of CEO duality. The coefficients on FCOM3it are positive (0.025 and 0.099) and statistically significant at the 1% level. This suggests that firms with non-dual CEOs (i.e., those who do not serve as both CEO and board chair) are more responsive to foreign competition in their cash holding decisions. Specifically, a 1% increase in foreign competition is associated with a 2.5% and 9.9% increase in cash holdings, respectively. Non-dual CEOs may prefer higher cash buffers to reduce perceived risk and enhance financial flexibility.

Columns (3) and (4) test for gender effects. We find positive and significant coefficients on FCOM3it (0.027 for male CEOs and 0.002 for female CEOs), significant at the 1% and 5% levels, respectively. This implies male CEOs tend to hold more cash in response to foreign competition than female CEOs, possibly reflecting differences in risk preferences or strategic priorities. Columns (5) and (6) assess the influence of CEO tenure. The coefficients on FCOM3it are 0.017 and 0.036, both positive and statistically significant. Notably, shorter-tenure CEOs show a stronger positive association, suggesting they are more inclined to accumulate cash, likely due to their focus on short-term stability and potential near-term investments. Overall, these results support hypotheses H2, H3, and H4, indicating that CEO characteristics shape how firms respond to foreign competition in their cash holding behaviour.

Table 8: Attributes of CEO Characteristics on Cash Holding

This table presents the regression results for the alternative measurements of foreign competition on cash holdings. CASH is the dependent variable, and FCOM3 is the independent variable. Columns (1) & (2) estimate the results for CEO duality, columns (3) & (4) estimate the results for gender classification and columns (5) & (6) estimate the results for CEO tenure. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Cash					
	Duality		Gender		CEO Tenure	
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Yes	No	Male	Female	Longer	Shorter
FCOM3	0.025***	0.099***	0.027***	0.002**	0.017**	0.036***
	(0.007)	(0.015)	(0.007)	(0.030)	(0.010)	(0.009)
CEO controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31,578	5,638	36,756	1,846	17,804	21,340
Sector Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes

4.5. Further analysis

4.5.1. Foreign competition and corporate cash holding – foreign vs domestic firms

We conduct additional analysis to examine differences in cash holding behavior between domestic and foreign firms. We argue that domestic firms are more likely than foreign firms to adopt proactive strategies - such as downsizing or increasing cash reserves - to withstand industry shocks and enhance survival prospects (Kang & Shivdasani, 1997). Based on this reasoning, we expect domestic firms to accumulate more cash in response to rising foreign competition. To test this, we split the sample into domestic and foreign firms and re-estimate the regression model. Table 9 presents the results using OLS regression with year and sector fixed effects.

Columns (1) and (2) show the results for domestic firms. The coefficients on FCOM3it are positive (both 0.024) and statistically significant at the 1% level, suggesting that a 1% increase in foreign competition is associated with a 2.4% increase in cash holdings after controlling for CEO-specific and firm-level characteristics. Columns (3) and (4) report the results for foreign firms. The coefficients on FCOM3it are larger (0.125 and 0.127) and also statistically significant at the 1% level. This indicates that foreign firms respond more strongly to foreign competition by holding higher levels of cash. One explanation is that foreign firms may feel more vulnerable operating in unfamiliar institutional environments and therefore hold more cash as a precaution. In contrast, domestic firms are more accustomed to local business practices, regulations, and market conditions, which may reduce their need for large cash reserves.

These findings suggest that foreign competition positively affects cash holdings in both firm types, though the effect is stronger for foreign firms. This analysis extends the literature, which has mostly examined cash holdings and foreign competition separately (e.g., Anderson & Hamadi, 2016; Duong et al., 2020; Xu et al., 2016; Cheung, 2016; Xia & Liu, 2018; Bowen & Wiersema, 2005).

Table 9: Domestic vs Foreign Firms on Cash Holding

This table presents the regression results for the alternative measurements of foreign competition on cash holdings. CASH is the dependent variable, and FCOM3 is the independent variable. Columns (1) & (2) estimate the results for domestic firms and columns (3) & (4) estimate the results for foreign firms. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

Variable	Dependent Variable: Cash			
	Domestic Firms		Foreign Firms	
	(1)	(2)	(3)	(4)
FCOM3	0.024***	0.024***	0.125***	0.127***
	(0.007)	(0.007)	(0.044)	(0.044)
CEO controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Observations	37,653	37,653	1,491	1,491
Sector Effects	No	Yes	No	Yes
Year Effects	No	Yes	No	Yes

Subsample regressions show that the positive association between foreign competition and cash holdings is strongest among multinational firms, consistent with their greater exposure to cross-border risks such as exchange rate volatility and international regulatory constraints. However, domestic firms also exhibit a positive but weaker response, suggesting that foreign competition creates sufficient product-market uncertainty to influence their liquidity decisions. For domestic firms, the mechanism is not international financial exposure but rather heightened domestic market pressure, reduced pricing power, and increased cash-flow volatility due to foreign entrants. These results support the view that while multinationals and non-multinationals face different financial environments, both groups perceive foreign competition as a relevant factor shaping their precautionary liquidity strategies.

4.5.3. Foreign competition and corporate cash holding – financial crisis

Lastly, we explore whether the 2008 global financial crisis influenced firms' cash holding behavior in response to foreign competition. Prior studies suggest that firms with high debt levels experienced more severe shocks during the crisis, particularly when led by narcissistic

CEOs (Patel & Cooper, 2014; Ho et al., 2016; Buyl, Boone & Wade, 2019). Such shocks may have left domestic firms especially vulnerable, reducing their ability to compete with foreign rivals. Building on this perspective, we empirically test whether the relationship between foreign competition and cash holdings among U.S. firms was affected by the 2007–2009 financial crisis.

Table 10 presents regression results from estimating Equation (1) using OLS with sector and year fixed effects, distinguishing between three periods: pre-crisis, crisis, and post-crisis. The dependent variable is cash holdings (CASHit), and the independent variable is foreign competition (FCOM3it).

Columns (1) and (2) show results for the pre-crisis period. The coefficients on FCOM3it are 0.106 and 0.105, respectively, and statistically significant at the 1% level. This suggests that a 1% increase in foreign competition is associated with a 10.5–10.6% increase in cash holdings, indicating a strong positive relationship prior to the crisis. Columns (3) and (4) report results for the crisis period. The coefficients increase to 0.156 and 0.155, respectively, and remain significant at the 1% level. This implies that during the crisis, firms were even more likely to accumulate cash in response to foreign competition-by roughly 15.5–15.6%-possibly due to heightened uncertainty and limited access to external financing. Columns (5) and (6) cover the post-crisis period. The coefficients on FCOM3it remain positive (0.118 and 0.116) and statistically significant, suggesting firms continued to respond to foreign competition by holding more cash even after the crisis.

Overall, the results show that firms held more cash during the crisis period than before or after, likely as a defensive response to uncertainty and potential liquidity constraints. These findings contribute to the literature by highlighting how financial crises can intensify the cash-holding response to foreign competition, extending prior work that has typically examined cash holdings or foreign competition in isolation (e.g., Anderson & Hamadi, 2016; Duong et al., 2020; Xu et al., 2016; Cheung, 2016; Xia & Liu, 2018; Bowen & Wiersema, 2005).

Table 10: Does Financial Crisis-2008 Periods Impact Cash Holding?

This table presents the regression results for the alternative measurements of foreign competition on cash holdings. CASH is the dependent variable, and FCOM3 is the independent variable. Columns (1), (3) & (5) estimate the results without year and sector-fixed effects, and columns (2), (4) & (6) estimate the results with year and sector-fixed effects. CASH is cash and marketable securities deflated by total assets, and FCOM3 is measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector. The final sample for our panel tests consists of 2,451 firms (50,883 firm-year observations) from the US market for the period 2000-2020. ***, **, and * indicate robust standard errors cluster by firm at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Cash					
Variable	Pre-Crisis		Crisis		Post-Crisis	
	(1)	(2)	(3)	(4)	(5)	(6)
FCOM3	0.106***	0.105***	0.156***	0.155***	0.118***	0.116***
	(0.009)	(0.009)	(0.014)	(0.014)	(0.007)	(0.007)
CEO controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,048	13,048	5,592	5,592	20,504	20,504
Sector Effects	No	Yes	No	Yes	No	Yes
Year Effects	No	Yes	No	Yes	No	Yes

5.0 Conclusion

Our findings contribute to theory and practice in three important ways. First, we demonstrate that foreign competition is a systematic determinant of corporate cash holdings, extending the trade-off theory of liquidity management to the international competition context. By treating foreign competition as an exogenous, policy-relevant shock, we highlight a mechanism distinct from domestic rivalry or industry volatility. Second, we show that CEO characteristics fundamentally shape how firms adjust liquidity under globalization pressures, extending upper-echelons theory into corporate finance. This contribution emphasizes that liquidity management reflects not only financial frictions but also the risk preferences, power, and demographics of top executives. Third, we reveal that the precautionary role of cash becomes even more pronounced during systemic crises such as the 2008 financial downturn. This finding advances the literature on financial resilience by showing that globalization pressures and macroeconomic shocks interact to amplify firms' reliance on cash buffers.

Our findings indicate that foreign competition is a significant determinant of corporate cash holdings. Firms exposed to higher levels of foreign competition tend to accumulate more cash, reflecting a strategic response to heightened uncertainty and potential financial constraints. This behavior underscores the precautionary motives behind cash retention in competitive international environments. Moreover, we demonstrate that CEO characteristics meaningfully moderate the relationship between foreign competition and cash holdings. CEO-specific traits influence managerial risk preferences and strategic priorities, thereby shaping firms' financial policies. These findings highlight the importance of incorporating managerial heterogeneity into analyses of corporate financial decision-making. We also show that the positive association between foreign competition and cash holdings intensifies during periods of

10

financial crisis, reinforcing the role of cash reserves as a buffer against macroeconomic shocks. This result offers important implications for corporate financial resilience in times of systemic distress.

Together, these insights provide a sharper theoretical understanding of how external shocks and internal managerial heterogeneity jointly drive liquidity strategies, offering implications for scholars, investors, and policymakers concerned with the resilience of firms in an increasingly globalized economy. While concentration ratios are widely used, we acknowledge that they may not fully capture all dimensions of foreign competition or firm-specific exposure. Alternative measures - such as import penetration or trade elasticity - could provide complementary insights into the intensity of globalization shocks. Exploring these alternative proxies offers a valuable avenue for future research. While our analysis controls for key determinants such as firm size, leverage, profitability, and fixed effects at the industry and year level, we acknowledge that other firm-level characteristics (e.g., R&D intensity, supply chain dependencies) and potential regional differences in trade policy across US states could also influence liquidity decisions. Moreover, although our main measure of cash is cash-to-assets, alternative measures such as cash-to-sales, and sub-sample analyses by firm age or export status, could further extend our findings. We leave these dimensions for future research, which may provide additional nuance to the relationship between foreign competition and cash holdings.

References

Acemoglu, D., Autor, D., Dorn, D., Hanson, G.H. and Price, B. (2016), "Import competition and the great U.S. employment sag of the 2000s", Journal of Labor Economics, Vol. 34 No. S1, pp. S141–S198.

Acharya, V.V., Almeida, H. and Campello, M. (2013), "Aggregate risk and the choice between cash and lines of credit", The Journal of Finance, Vol. 68 No. 5, pp. 2059–2116.

Almeida, H., Campello, M. and Weisbach, M. (2004), "The cash flow sensitivity of cash", Journal of Finance, Vol. 59, pp. 1777–1804.

Anderson, R.W. and Hamadi, M. (2016), "Cash holding and control-oriented finance", Journal of Corporate Finance, Vol. 41, pp. 410–425.

.

Autor, D.H., Dorn, D. and Hanson, G.H. (2013), "The China syndrome: Local labor market effects of import competition in the United States", American Economic Review, Vol. 103 No. 6, pp. 2121–2168.

Bakke, T., Fu, Z., Mahmudi, H. and Zhu, C.H. (2022), "Foreign competition and CEO risk-incentive compensation", Journal of Corporate Finance, Vol. 76, 102241.

Bates, T.W., Kahle, K.M. and Stulz, R.M. (2009), "Why do US firms hold so much more cash than they used to?", The Journal of Finance, Vol. 64 No. 5, pp. 1985–2021.

Baumol, W.J. (1952), "The transactions demand for cash: An inventory theoretic approach", The Quarterly Journal of Economics, Vol. 66, pp. 545–556.

Benoit, J. (1984), "Financially constrained entry in a game with incomplete information", Rand Journal of Economics, Vol. 15, pp. 490–499.

Berry, W.D. and Feldman, S. (1985), Multiple Regression in Practice, Sage, Newbury Park, CA.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", Journal of Econometrics, Vol. 87 No. 1, pp. 115–143.

Bolton, P. and Scharfstein, D.S. (1990), "A theory of predation based on agency problems in financial contracting", American Economic Review, Vol. 80 No. 1, pp. 93–106.

Bowen, H.P. and Wiersema, M.F. (2005), "Foreign-based competition and corporate diversification strategy", Strategic Management Journal, Vol. 26 No. 12, pp. 1153–1171.

Buyl, T., Boone, C. and Wade, J.B. (2019), "CEO narcissism, risk-taking, and resilience", Journal of Management, Vol. 45, pp. 1372–1400.

Campello, M. (2006), "Debt financing: does it boost or hurt firm performance in product markets?", Journal of Financial Economics, Vol. 82 No. 1, pp. 135–172.

Chen, Q., Chen, X., Schipper, K., Xu, Y. and Xue, J. (2012), "The sensitivity of corporate cash holdings to corporate governance", The Review of Financial Studies, Vol. 25 No. 12, pp. 3610–3644.

Cheung, A.W.K. (2016), "Corporate social responsibility and corporate cash holdings", Journal of Corporate Finance, Vol. 37, pp. 412–430.

Claessens, S., Demirguc-Kunt, A. and Huizinga, H. (2001), "How does foreign entry affect domestic banking markets?", Journal of Banking and Finance, Vol. 25, pp. 891–911.

Cunha, I. and Pollet, J. (2020), "Why do firms hold cash? Evidence from demographic demand shifts", The Review of Financial Studies, Vol. 33 No. 9, pp. 4102–4138.

Denis, D.J. and Sibilkov, V. (2010), "Financial constraints, investment, and the value of cash holdings", Review of Financial Studies, Vol. 23, pp. 247–269.

Deshmukh, S., Goel, A.M. and Howe, K.M. (2021), "Do CEO beliefs affect corporate cash holdings?", Journal of Corporate Finance, Vol. 67, 101886.

Dittmar, A. and Duchin, R. (2011), "The dynamics of cash", Working paper, University of Michigan.

Dittmar, A. and Mahrt-Smith, J. (2007), "Corporate governance and the value of cash holdings", Journal of Financial Economics, Vol. 83, pp. 599–634.

Dittmar, A., Mahrt-Smith, J. and Servaes, H. (2003), "International corporate governance and corporate cash holdings", Journal of Financial and Quantitative Analysis, Vol. 38, pp. 111–134.

Duchin, R. (2010), "Cash holdings and corporate diversification", Journal of Finance, Vol. 65, pp. 955–992.

Duong, H.N., Nguyen, J.H., Nguyen, M. and Rhee, S.G. (2020), "Navigating through economic policy uncertainty: The role of corporate cash holdings", Journal of Corporate Finance, Vol. 62, 101607.

Faleye, O. (2004), "Cash and corporate control", Journal of Finance, Vol. 59, pp. 2041–2060.

Foley, F., Hartzell, J., Titman, S. and Twite, G. (2007), "Why do firms hold so much cash? A tax-based explanation", Journal of Financial Economics, Vol. 86, pp. 579–607.

Francis, B., Hasan, I. and Wang, H. (2014), "Banking deregulation, consolidation, and corporate cash holdings: US evidence", Journal of Banking and Finance, Vol. 41, pp. 45–56.

Franke, G., Crown, D. and Spake, D. (1997), "Gender differences in ethical perceptions of business practices", Journal of Applied Psychology, Vol. 82 No. 6, pp. 920–934.

Fresard, L. (2010), "Financial strength and product market behaviour", The Journal of Finance, Vol. 65 No. 3, pp. 1097–1122.

Ghaly, M., Dang, V.A. and Stathopoulos, K. (2015), "Cash holdings and employee welfare", Journal of Corporate Finance, Vol. 33, pp. 53–70.

Grullon, G. and Michaely, R. (2007), "Corporate payout policy and product market competition", Working paper, Rice University.

Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: The organisation as a reflection of its top managers", Academy of Management Review, Vol. 9 No. 2, pp. 193–206.

Harford, J., Klasa, S. and Maxwell, W. (2014), "Refinancing risk and cash holdings", Journal of Finance, Vol. 69, pp. 975–1011.

Harford, J., Mansi, S. and Maxwell, W. (2008), "Corporate governance and firm cash holdings in the US", Journal of Financial Economics, Vol. 87, pp. 535–555.

Hasan, T.A., Alam, M.S., Paramati, S.R. and Islam, S.M. (2022), "Does firm-level political risk affect cash holdings?", Review of Quantitative Finance and Accounting, Vol. 59, pp. 311–337.

Hoberg, G., Phillips, G. and Prabhala, N. (2014), "Product market threats, payouts, and financial flexibility", Journal of Finance, Vol. 69, pp. 293–324.

Ho, P., Huang, C., Lin, C. and Yen, J. (2016), "CEO overconfidence and financial crisis", Journal of Financial Economics, Vol. 120, pp. 194–209.

Itzkowitz, J. (2013), "Customers and cash: How relationships affect suppliers' cash holdings", Journal of Corporate Finance, Vol. 19, pp. 159–180.

Jensen, M.C. (1986), "Agency costs of free cash flow, corporate finance, and takeovers", American Economic Review, Vol. 76, pp. 323–329.

Kang, J.-K. and Shivdasani, A. (1997), "Corporate restructuring during performance declines in Japan", Journal of Financial Economics, Vol. 46, pp. 29–65.

Katics, M.M. and Petersen, B.C. (1994), "The effect of rising import competition on market power", Journal of Industrial Economics, Vol. 42, pp. 277–286.

Kim, C.S., Mauer, D.C. and Sherman, A.E. (1998), "The determinants of corporate liquidity", Journal of Financial and Quantitative Analysis, Vol. 33, pp. 335–359.

Kotcharin, S. and Maneenop, S. (2020), "Geopolitical risk and corporate cash holdings in the shipping industry", Transportation Research Part E, Vol. 136, 101862.

Kuan, T.H., Li, C.S. and Liu, C.C. (2012), "Corporate governance and cash holdings", International Review of Economics and Finance, Vol. 24, pp. 303–314.

Kusnadi, Y. and Wei, K.C.J. (2011), "The determinants of corporate cash management policies: evidence from around the world", Journal of Corporate Finance, Vol. 17 No. 3, pp. 725–740.

Lee, C.C. and Wang, C.W. (2021), "Firms' cash reserve, financial constraint, and geopolitical risk", Pacific-Basin Finance Journal, Vol. 65, 101480.

Lins, K.V., Servaes, H. and Tufano, P. (2010), "What drives corporate liquidity? An international survey of cash holdings and lines of credit", Journal of Financial Economics, Vol. 98 No. 1, pp. 160–176.

Miller, M. and Orr, D. (1966), "A model of the demand for money by firms", Quarterly Journal of Economics, Vol. 80, pp. 413–435.

Modigliani, F. and Miller, M.H. (1958), "The cost of capital, corporation finance and the theory of investment", The American Economic Review, Vol. 48 No. 3, pp. 261–297.

Nguyen, T.T., Nguyen, M.C., Bui, H.Q. and Vu, T.N. (2021), "The cash-holding link within the supply chain", Journal of Corporate Finance, (in press).

Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R. (1999), "The determinants and implications of corporate cash holdings", Journal of Financial Economics, Vol. 52, pp. 3–46.

Palazzo, B. (2012), "Cash holdings, risk, and expected returns", Journal of Financial Economics, Vol. 104 No. 1, pp. 162–185.

Patel, P.C. and Cooper, D. (2014), "The harder they fall, the faster they rise", Strategic Management Journal, Vol. 35, pp. 1528–1540.

Pavcnik, N. (2002), "Trade liberalization, exit, and productivity improvements", Review of Economic Studies, Vol. 69, pp. 245–276.

Pfeffer, J. and Salancik, G. (2015), External Control of Organizations: A Resource Dependence Perspective, Routledge, Abingdon.

Pinkowitz, L., Stulz, R. and Williamson, R. (2006), "Does the contribution of corporate cash holdings and dividends to firm value depend on governance?", Journal of Finance, Vol. 61, pp. 2725–2751.

Srinivasan, S. (2020), "Foreign competition and acquisitions", Journal of Corporate Finance, Vol. 60, 101484.

Staiger, D.O. and Stock, J.H. (1994), "Instrumental variables regression with weak instruments", Econometrica, Vol. 62, pp. 557–586.

Stock, J.H. and Yogo, M. (2002), "Testing for weak instruments in linear IV regression", NBER Working Paper.

Tong, Z. (2011), "Firm diversification and the value of corporate cash holdings", Journal of Corporate Finance, Vol. 17, pp. 741–758.

Valta, P. (2012), "Competition and the cost of debt", Journal of Financial Economics, Vol. 105, pp. 661–682.

Walter, I. and Gray, P.H. (1983), "Protectionism and international banking", Journal of Banking and Finance, Vol. 7, pp. 597–609.

Xia, T. and Liu, X. (2018), "Foreign competition and innovation", British Journal of Management, Vol. 29 No. 3, pp. 464–482.

Xia, T. and Liu, X. (2017), "Foreign competition, domestic competition and innovation", Journal of International Business Studies, Vol. 48 No. 6, pp. 716–739.

Xu, J. (2012), "Profitability and capital structure: Evidence from import penetration", Journal of Financial Economics, Vol. 106, pp. 427–446.

Xu, N., Chen, Q., Xu, Y. and Chan, K.C. (2016), "Political uncertainty and cash holdings", Journal of Corporate Finance, Vol. 40, pp. 276–295.

Zhang, X., Tang, G. and Lin, Z. (2016), "Managerial power, agency cost and executive compensation", Chinese Management Studies, Vol. 10 No. 1, pp. 119–137.

Appendix Table 1: Description of variables

Variables	Description
Dependent	
Cash Holdings (CASH)	Cash and marketable securities deflated by total assets.
Change in Cash Holdings (ΔCASH)	Cash and marketable securities at time $t + 1$ minus cash and marketable securities at time t, deflated by total assets.
Independent	
Foreign competition (FCOMP3)	Measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each sector (Xia & Liu, 2018).
Foreign competition (FCOMP4)	Measured using the concentration ratio, which is the total market share of the eight largest foreign firms in each industry (Xia & Liu, 2018)
Foreign competition (FCOMP6)	Measured using the concentration ratio, which is the total gross profit weigthed by market share of the eight largest foreign firms in each industry (Boon et al, (2007).
Firm Specific Controls	
Firm size (SIZE)	The natural logarithm of the book value of Total Assets, Bates et al. (2009).
Tobin's Q (TQ)	The market value of assets divided by the book value of assets. It proxies for growth prospects, Bates et al. (2009),
Return on assets (ROA)	The operating income before depreciation divided by the book value of assets. It serves as a proxy for profitability and the availability of internal funds.
Book Leverage (BLEV)	The summation of the book value of long-term debt and debt in current liabilities divided by market value of assets. Bates et al. (2009),
Earnings volatility (EVOL)	The standard deviation of a firm's return on assets over the previous five years (inclusion in the sample necessitates a firm to have at least three years of data during the prior five years). It is a proxy for the likelihood of financial distress.
Dividend (DIV)	An indicator for whether a firm pays common dividends (i.e. a variable equal to one if a firm pays common dividends, and zero otherwise). It also proxies for financial constraints, Bates et al. (2009).

Capital Expenditure (CAPEX)	The net capital expenditure (capital expenditure minus depreciation) divided by the book value of total property, plant and equipment, Bates et al. (2009).
Asset Tangibility (TANG)	The book value of total tangible assets scaled by total assets.
Financial Constraint (CONST)	The firm's interest expenditures scaled by total assets. It proxies for a firm's capabilities of obtaining loans.
Stock Return Volatility (RETURN)	The quarterly historical stock return volatility, i.e., the standard deviation of monthly stock returns in previous four months.
Firm Age (FAGE)	The natural logarithm of the time between when a firm goes public and the end of the fiscal year, Anderson and Hamadi, 2016).

CEO Specific Controls

CEO Duality (DUALITY)	An indicator variable equal to one if the CEO is also the chairperson of the board of directors as of the end of the first fiscal year. The dual role also proxies for CEO power as well as the difficulty and complexity of CEO's job.
CEO Age (AGE)	The natural logarithm of CEO's age at the end of the fiscal year.
CEO Gender (GENDER)	An indicator variable equal to one if the CEO is male, and zero otherwise.
CEO Tenure (TENURE)	The natural logarithm of number of years the CEO has served in the position as of the end of the fiscal year. It is an additional proxy for CEO power.
CEO Compensation COMPENS)	The natural logarithm of CEOs total compensation over the fiscal year. The sum of salary, bonus, total value of restricted stock granted, total value of stock options granted (estimated using Black-Scholes), long-term incentive payouts, and other compensation.
CEO Optimism (OPTIMISM)	An indicator variable equal to one if CEO holds options with average moneyness of at least 67 percent during the fiscal year.