IMPACTS OF ECONOMIC UNCERTAINTY AND INTERDEPENDENCY OF INVESTMENTS AND FINANCIAL DECISIONS

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Abstract: This research investigates the impact of uncertainty on financing and investing decisions of publicly listed companies in Australia, Indonesia, Malaysia, Singapore, South Korea and Taiwan from 1996 to 2020. Previous research used single equation approaches to investigate the impact of uncertainty on financing or investing decisions,and this will lead to omitted variable bias because investing and financing decisions are interdependent. The Authors apply two-step GMM system to eliminate simultaneous biases of the system of equations and dynamic interdependency of investing and financing decisions. The results show that economic uncertainty affects the investment and financial policies of constrained and unconstrained firms differently. Economic uncertainty motivates financially constrained firms to increase cash holdings stronger than unconstrained firms.

Keywords: Economic uncertainty, interdependency, financially constrained firms

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Introduction

According to Im et al. (2020), the high economic and political uncertainty causes financial market frictions to surge. The economic uncertainty also reduces the accessibility of financially constrained firms to the capital markets. The surge of uncertainty leads to a delay in investment until additional information is obtained. This investment delay makes firms hoard cash holdings to take delayed investment opportunities at the proper time (Goodell et al., 2021). In other words, a firm's various financial policies and investment decisions are interdependently determined under uncertainty (Fazzari et al.,1988).At the same time, previous research that focuses on the impact of uncertainty on the financing or investing

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decisions of the firms assumes that various financial decisions and investments are determined independently (Gulen and Ion, 2016; Çolak et al.,2017). Gatchev et al (2010) point out that single equation approaches based on the isolation of financing and investing decisions lead to omitted variable bias. Kirch and Terra (2019) also argue that investing and financing decisions are interdependent. Under financial constraints, firms must optimally allocate limited funds, ensuring various financing and investing decisions are simultaneously determined. The impact of uncertainty, however, on financing and investing decisions using system of equations approaches has been limitedly explored. Thus,the study investigates the effects of uncertainty on investing-financing decisions using a system of equations in six East Asian markets. Our research contributes several points to existing literature.

First, this research contributes to the interrelationship between uncertainty and the dynamic aspect of financing and investing decisions using simultaneous equation approaches to analyze the simultaneous financing and investing decisions of the firm. Second, it accounted for the effects of economic uncertainty on effects of economic uncertainty on the dynamics of investing and financing decisions for both constrained and unconstrained firms. The ongoing research aligns with Bolton et al. (2019), concentrating on the consequences of uncertainty and investment choices for unconstrained and constrained firms. Extending their discoveries, this study incorporates cash holdings, leverage, and dividend policy of the firm in the system of equations. Consequently, distinct effects of economic uncertainty on the investing and financing decisions for financially constrained and unconstrained firms are unveiled.

Literature Review

Economic Uncertainty and Investments

Uncertainty from risk, which may be reducible as it is hard to measure its probability distribution (Neamtiu et al., 2014). Uncertainty negatively affects investment because, in circumstances where it is either irreversible or delayed, firms would prefer to acquire new information to reduce future occurrences rather than provoke an opportunity cost by investing (Novy-Marx, 2007). The boost of the waiting option value with the increase in uncertainty results in a decline investment. Gulen and Ion (2016) also show that uncertainty has stronger negative effects on firms with higher irreversible investments since it induces precautionary delay. Furthermore, economic uncertainty tends to increase market friction (Kaviani et al., 2020). According to Almeida and Campello (2007), financial frictions intensify adverse impacts on investments. The escalation of market frictions in times of high uncertainty compels firms to seek external financing at a higher cost of capital than in periods of low economic uncertainty (Çolak et al., 2018). In instances where firms cannot fund their investment projects internally or face financial constraints due to the elevated costs of external financing (Bolton et al., 2019). Consequently, if the uncertainty increase, investment decreases more sharply for financially constrained firms than for unconstrained ones (Boyle and

Guthrie, 2003). Thus, if uncertainty increases by postponing investment projects, firms may get better financing circumstances (Makosa et al., 2021) and preserve their option value.

Economic Uncertainty and Cash Holdings

When the uncertainty of future economic conditions increases, firm managers tend to become more conservative and apply the same vain policy on cash holdings. Uncertainty changes the firm's cash demand (Baum et al., 2009), and cash holding impacts other financial policies (Duong et al., 2020). Under high uncertainty, cash holdings mitigate debt refinancing risk (Harford et al., 2014) and reduce the opportunity costs of expensive external financing. Phan et al (2019) find that these precautionary motives under high economic uncertainty cause firms to hoard more cash holdings. Thus, firms reduce dividends to reserve cash holdings during periods of high uncertainty (Sarwar et al., 2020). Cash holdings' role in mitigating the negative impacts of economic uncertainty in various types of investments is dominant, especially for financially constrained firms (Im et al., 2017). Unconstrained firms' cash holdings are also less affected by increased uncertainty because they can access external financing flexibly (Duong et al., 2020). Duong et al. (2020) argue that hoarded cash holdings during high uncertainty successfully attenuate the negative shocks to investment. Their research shows that uncertainty amplifies the cash holdings for financially constrained firms.

Economic Uncertainty and Leverage

Economic uncertainty as external factors affect the firm’s financial policies. During periods of increased economic uncertainty, firms face the surge of asymmetric information that causes an increase in financial market frictions. These market frictions increase external funding costs, such as the cost of bank debts (Francis et al., 2014), the cost of debt financing (Q. T. Tran, 2021), and equity risk premium (Pástor and Veronesi, 2012). The increase in funding costs also causes high credit risks (Gilchrist et al., 2014) and high default risks (Nguyen et al., 2022). Çolak et al. (2017) show that during high economic uncertainty, the number of IPO and IPO price tends to decrease. Bordo et al. (2016) also show that under high uncertainty, the growth of bank credits decreases because of deteriorated bank characteristics that are influenced by the high economic uncertainty. Thus, under high uncertainty, financial market players increase related floatation costs (Çolak et al., 2018; Liu and Zhang, 2020) to mitigate and alleviate shocks. These impacts of economic uncertainty make firms reduce the usage of debts. Baum et al. (2009) and Liu and Zhang (2020) find that firms under high economic uncertainty significantly decline their leverage ratio. Economic uncertainty decreases financial constraints for a short period by postponing firms’ investment and hoarding cash holdings. Financially constrained firms may be more conservative in leveraging because of relatively expensive external funding costs under increase uncertainty. During periods of high uncertainty, firms hoard cash holdings to serve as reserves for future investments (Breuer et al., 2017) and adjust the dividend policy (Walkup, 2016). Liu and Zhang (2020) and Makosa et al. (2021) find that leverage tends to

decrease due to increased uncertainty in the Chinese stock markets. Meanwhile, financially less constrained firms can alleviate the negative effects of economic uncertainty using external financing networks. Im et al (2020) also state that firms with higher uncertainty tend to have lower target leverage because it deteriorates the benefits of the tax shield and amply increases potential financial distress costs.

Economic Uncertainty and Payout Policies

During the heightened economic uncertainty, asymmetric information between managers and investors increases potential agency problems. As firms take the strategy of 'wait and see' to the investment under high uncertainty, firms hoard cash holdings (Makosa et al., 2021). The hoarding of cash holdings may exaggerate potential agency problems. Thus, firms may pay high dividends to mitigate the increased agency problems during periods of high economic uncertainty (Attig et al., 2021). During times of high economic uncertainty, internal funding requests also increase expensive external funding costs (Alhudhaif, 2021). This condition suggests a negative association between economic uncertainty and dividend payout (Pástor and Veronesi, 2012; Xu, 2020). Attig et al. (2021) find a positive association between economic uncertainty and dividend payout. Meanwhile, Tran (2020) finds the negative impacts of the economic uncertainty on the dividend payout and stock repurchase.

Interdependency of the Investment and Financial Policies

Gatchev et al. (2010) use simultaneous equation systems to prove that dividend and cash holdings positively affect short-term debts. Interestingly, short-term debts and dividends have a negative effect on cash holdings. Kirch and Terra (2019) also state that credit markets can lead to rationing or limiting external borrowing based on asymmetric information. When firms make investment decisions, their funding is simultaneously limited by financial resources' internal and external availability and the impact on various financing policies (Li et al., 2021; Fachrudin, Pirzada., and Iman, 2022). It also tends to limit external funding and debt usage when increased uncertainties exacerbate market frictions, reducing cash holdings. Thus, the authors develop hypotheses as follows;

H1: Uncertainty negatively affects investment for financially constrained firms in simultaneous equation systems.

H2: An increase in economic uncertainty negatively affects the leverage of the firm cash holdings and dividends for the financially constrained firms in systems of simultaneous equations.

Research Methodology

The public firms in six Pacific countries are used. The sample spans from 1996 to 2020 mainly because of the adoption of the World Uncertainty Index (WUI) developed by Ahir et al.,(2018). The country level WUI is applied based on the frequent appearance of the word 'uncertainty' in the quarterly Economist Intelligence Unit reports (Ahir et al., 2018). The firm-level quarterly accounting information for each country is retrieved from SandP Capital IQ database.

Financial firms and utilities are excluded from the sample. The systems of simultaneous equations are applied to analyze the interdependency relationship among financial policies and investments (Gatchev et al., 2010; Kirch and Terra, 2019). GMM is adopted to mitigate the endogenous problems of the dynamic panel model and the interrelationship of the investing and financing variables. The study adopts control variables of the investment equation from Kim and Kung (2017) and cash holdings of Opler et al (1999) and Breuer et al. (2017). Meanwhile, the leverage and payout equation are mainly based on Lambrecht and Myers (2017) and Im et al.

$$Inv_{i,t} = \alpha_{10i,t} + \alpha_{11} U_{i,t} + \alpha_{12} Inv_{i,t-1} + \alpha_{13}\Delta Cash_{i,t} + \alpha_{14}\Delta Cash_{i,t-1} + \alpha_{15} Div_{i,t} + \alpha_{16} Div_{i,t-1} + \alpha_{17}\Delta Lev_{i,t} + \alpha_{18}\Delta Lev_{i,t-1} + \sum_{i=19}^{24} \alpha_i X_{i,t} + \mu_t + \varepsilon_{i,t}^{Inv} \quad (1)$$

$$\Delta Lev_{i,t} = \beta_{10\,i,t} + \beta_{11} U_{i,t} + \beta_{12} \Delta Lev_{i,t-1} + \beta_{13}\Delta Cash_{i,t} + \beta_{14}\Delta Cash_{i,t-1} + \beta_{15} Div_{i,t} + \beta_{16} Div_{i,t-1} + \beta_{17} Inv_{i,t} + \beta_{18} Inv_{i,t-1} + \sum_{i=19}^{30} \beta_i X_{i,t} + \kappa_t + \varepsilon_{i,t}^{\Delta Lev} \quad (2)$$

$$\Delta Cash_{i,t} = \gamma_{10i,t} + \gamma_{11} U_{i,t} + \gamma_{12} \Delta Cash_{i,t-1} + \gamma_{13} Inv_{i,t} + \gamma_{14} Inv_{i,t-1} + \gamma_{15} Div_{i,t} + \gamma_{16} Div_{i,t-1} + \gamma_{17}\Delta Lev_{i,t} + \gamma_{18}\Delta Lev_{i,t-1} + \sum_{i=19}^{24} \gamma_i X_{i,t} + \eta_t + \varepsilon_{i,t}^{\Delta Cash} \quad (3)$$

$$Div_{i,t} = \delta_{10\,i,t} + \delta_{11} U_{i,t} + \delta_{12} Div_{i,t-1} + \delta_{13}\Delta Cash_{i,t} + \delta_{14}\Delta Cash_{i,t-1} + \delta_{15} Inv_{i,t} + \delta_{16} Inv_{i,t-1} + \delta_{17}\Delta Lev_{i,t} + \delta_{18}\Delta Lev_{i,t-1} + \sum_{i=19}^{30} \delta_i X_{i,t} + \tau_t + \varepsilon_{i,t}^{Div} \quad (4)$$

Table 1: Definition Operational

Indenpendent Variable	Formula/Operationalization
Investment in capital ($Inv_{i,t}$)	CAPEX $_{i,t}$ / $TA_{i,\ t-1}$
Change in debt ($\Delta Lev_{i,t}$)	[$TD_{i,t}$ – TD $_{t-1}$]/ $TA_{i,t-1}$
Change in cash holdings ($\Delta Cash_{i,t}$)	[Cash and cash equivalents $_{i,t}$ – Cash and cash equivalent $_{i,t-1}$]/ $TA_{i,t-1}$
Dividends (Div $_{i,t}$)	Cash dividends $_{i,t}$/ TA $_{i,t-1}$
Control Variables in Investment	
Change in net working Capital ($\Delta NWC_{i,t}$)	[(CA(less cash)$_{i,t}$- CL(les short-term debt) $_{i,t-1}$) – ($CA_{i,t-1}$ - $CL_{i,t-1}$)]/$TA_{i,t-1}$
Cash holdings ($Cash_{i,t}$)	Cash and cash equivalents$_{i,t-1}$/$TA_{i,t-1}$
Fixed assets ($NFA_{i,t}$)	Net $FA_{i,t}$/$TA_{i,t}$
Leverage ($Lev_{i,t}$)	$TD_{i,t}$/$TA_{i,t-1}$
Growth opportunity ($Grow_{i,t}$)	$MVE_{i,t}$/$BVE_{i,t}$
Internal cash flow ($ICF_{i,t}$)	[EBITDA $_{i,t}$ – Interest $_{i,t}$ – Tax $_{i,t}$ - ΔNWC $_{i,t}$]/TA $_{i,t-1}$
Cash flow volatility of an industry ($Cvol_{i,t}$)	3 years industry internal cash flow volatility by 2-digit SIC codes.
Recoverable fraction of assets ($RFA_{i,t}$)	[Cash and cash equivalents $_{i,t}$ + $AR_{i,t}$+ Inventories$_{i,t}$ + Net $FA_{i,t}$]/[$TA_{i,t}$ x Effective debt enforcement factors]
Control Variables in Leverage	

Change in net working Capital ($\Delta NWC_{i,t}$)	$[(CA(\text{less cash})_{i,t} - CL(\text{les short-term debt})_{i,t-1}) – (CA_{i,t-1} - CL_{i,t-1})]/TA_{i,t-1}$
Cash holdings ($Cash_{i,t}$)	Cash and cash equivalents $_{i,t}/TA_{i,t}$
Fixed assets ($NFA_{i,t}$)	Net $FA_{i,t}/TA_{i,t}$
Leverage ($Lev_{i,t}$)	$TD_{i,t}/TA_{i,t}$
Growth opportunity ($Grow_{i,t}$)	$MVE_{i,t}/BVE_{i,t}$
Internal cash flow ($ICF_{i,t}$)	$[EBITDA_{i,t} – Interest_{i,t} – Tax_{i,t} - \Delta NWC_{i,t}]/TA_{i,t-1}$
Recoverable fraction of assets ($RFA_{i,t}$)	[Cash and cash equivalents $_{i,t}$ + $AR_{i,t}$ + Inventories $_{i,t}$ + Net $FA_{i,t}$]/[$TA_{i,t}$ x Effective debt enforcement factors]
Size of the firm ($Size_{i,t}$)	Log Market capitalization $_{i,t}$
Change of industry average of the leverage ($\Delta ILev_{i,t}$)	Industry average change $TD_{i,t}/TA_{,t}$ based on 2-digit SIC
Profitability ($Prof_{i,t}$)	Operating profit $_{i,t}/TA_{i,t-1}$
Operating risk ($Risk_{i,t}$)	Standard deviation of Return on Assets (ROA) by window from t-12 to t, after at least 8 observations
Control Variables in Cash Holdings	
Change in net working Capital ($\Delta NWC_{i,t}$)	$[(CA(\text{less cash})_{i,t}- CL(\text{les short-term debt})_{i,t-1}) – (CA(\text{less cash})_{i,t-1} - CL(\text{less short-term debts})_{i,t-1})]/TA_{i,t-1}$
Cash holdings ($Cash_{i,t}$)	Cash and cash equivalents $_{i,t}/TA_{i,t}$
Size of the firm ($Size_{i,t}$)	Logarithm Market Capitalization$_{i,t}$
Growth opportunity ($Grow_{i,t}$)	$MVE_{i,t}/BVE_{i,t}$
Internal cash flow ($ICF_{i,t}$)	$[EBITDA_{i,t}– Interest_{i,t} – Tax_{i,t} - \Delta NWC_{i,t}]/TA_{i,t-1}$
Fixed assets ($NFA_{i,t}$)	Net $FA_{i,t}/TA_{i,t}$
Profitability ($Prof_{i,t}$)	Operating profits $_{it}/TA_{it-1}$
Research and Development ($RD_{i,t}$)	$RandD_{i,t}/TA_{i,t-1}$
Cash flow volatility of an industry ($Cvol_{i,t}$)	3 years industry internal cash flow volatility by 2-digit SIC codes.
Control Variables in Dividends	
Change in net working Capital ($\Delta NWC_{i,t}$)	$[(CA(\text{less cash})_{i,t} - CL(\text{les short-term debt})_{i,t}) – (CA(\text{less cash})_{i,t-1} - CL(\text{less short-term debts})_{i,t-1})]/TA_{i,t-1}$
Size of the firm ($Size_{i,t}$)	Logarithm Market capitalization $_{i,t}$
Growth opportunity ($Grow_{i,t}$)	$MVE_{i,t}/BVE_{i,t}$
Internal cash flow ($ICF_{i,t}$)	$[EBITDA_{i,t} – Interest_{i,t} – Tax_{i,t} - \Delta NWC_{i,t}]/TA_{i,t}$
Ownership ($Own_{i,t}$)	Majority shareholder’s ownership

Financially constrained and unconstrained firms are classified in accordance with the following criteria: Size: Diamond and Verrecchia (1991) stated that large firms usually benefit from information sharing more than small ones. Therefore, they tend to face less asymmetric problems and access external funding. 30% of the top ranked establishments based on total assets are referred to as financially unconstrained firms. Bankruptcy probabilities: According to Altman et al. (2005, 2019), firms in insolvency areas (less than 4.50) are considered financially

constrained. In contrast, those in low-risk regions are categorized as bigger than 6.25 as financially unconstrained. Denis and Sibilkov (2010) defined financial constraints without considering the bankruptcy probabilities.

Research Results

Based on Table 2 below, financially unconstrained firms' investment activities are more homogenous than constrained ones. The leverage and cash holdings of financially constrained firms are higher and lower than the unconstrained ones. Firm characteristics such as standard deviation of return on assets, size, RandD and change of net working capital are more stable for unconstrained firms than constrained ones.

Table 2. Descriptive Statistics

	All Firms			Constrained			Unconstrained		
	N	Mean	Std.	N	Mean	Std.	N	Mean	Std.
Invest	264861	.012	.029	70240	.012	.033	139274	.012	.028
Δ Lev	264955	0	.059	70240	.004	.085	139368	-.002	.045
Δ Cash	264955	.002	.069	70240	-.001	.07	139368	.004	.075
Dpr	277402	.2092	.5750	74999	.119	.443	146113	.240	.616
Uncertainty	287202	.601	1.451	77453	.316	.236	150955	.106	.132
Lev	287202	.199	.196	77453	.119	.189	150955	.162	.176
Cash	287202	.133	.17	70240	-.013	.108	138812	.007	.084
Δ NWC	264399	0	.09	77453	.335	.285	150911	.272	.23
NFA	287158	.303	.252	75165	.003	.005	148491	.002	.003
Grow	281453	.002	.003	70240	-.006	.064	138812	.014	.039
ICF	264399	.01	.046	57376	.045	.148	108692	.04	.145
Std_ICF	206410	.04	.142	70240	.003	.012	138812	.002	.008
RD	264399	.002	.009	75790	.103	0.163	148990	.056	.083
Std_ROA	282585	0.648	0.1091	77453	.395	.26	150361	.4	.232
RFA	286608	.395	.238	70240	.001	.006	138812	.004	.007
Prof	264399	.003	.006	75209	1.485	3.596	148567	1.791	3.444
Log(Size)	281609	1.78	3.57	70240	.012	.033	139274	.012	.028

Table 3. Effect of the Uncertainty on *Investment* under System Equations

	(1) Invest (Full)	(2) Invest (Big)	(3) Invest (Small)	(4) Difference (Big-Small)
Uncertainty	-0.000	-0.003*	-.0.004**	0.002
	(0.000)	(0.002)	(0.002)	(0.002)
Invest t-1	0.367***	0.136*	.0.380***	0.040**

	(0.061)	(0.102)	(0.106)	(0.104)
Δ Cash t	-0.042	-0.008*	-0.035	0.053
	(0.036)	(0.012)	(0.048)	(0.035)
Δ Cash t-1	-0.043***	0.011	-0.021***	0.050
	(0.013)	(0.038)	(0.005)	(0.027)
Dpr t	0.000	-0.000**	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Dpr t-1	0.001	0.000	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.000)
Δ Lev t	-0.158*	0.256	0.060	0.383
	(0.093)	(0.268)	(0.081)	(0.199)
Δ Lev t-1	-0.013	0.047	0.033	0.054
	(0.031)	(0.090)	(0.042)	(0.071)
Cash t	0.040**	0.018	-0.023	0.061
	(0.017)	(0.078)	(0.069)	(0.074)
Lev t	-0.008	-0.039	-0.039***	0.039
	(0.008)	(0.040)	(0.014)	(0.030)
ΔNWC t	0.003	-0.000	-0.004	0.007
	(0.013)	(0.013)	(0.030)	(0.023)
NFA t	0.044***	0.072*	-0.011	0.134
	(0.017)	(0.059)	(0.063)	(0.061)
Growth t	1.319*	0.355	-0.280	0.955
	(0.699)	(1.138)	(1.113)	(1.126)
ICF t	-0.013	0.144	-0.002	0.247
	(.0283)	(0.119)	(0.042)	(0.089)
Std_ ICF t	0.006**	0.006	0.007	0.006
	(0.003)	(0.010)	(0.005)	(0.008)
RFA t	0.029	0.039	0.029	0.045
	(0.027)	(0.092)	(0.085)	(0.089)
Intercept	-0.000***	-0.000	-0.000	0.000
	(0.000)	(.0003)	(0.000)	(0.000)
Industry dummy	YES	YES	YES	YES
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Sargan-Hansen test (2-step)	0.243	0.147	0.113	
Arellano-Bond test AR(2)	.0.579	0.345	0.722	
Observations	170134	75458	74759	

Source: Data Processing (2022) *Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 4. Effect of the Uncertainty to *Leverage Change* under System Equations

	(1) Full	(2) Big	(3) Small	(4) Difference (Big-Small)
Uncertainty	-0.001***	-0.001***	-0.001	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Δ Lev t-1	0.238	-0.266**	0.412	-0.679***
	(0.168)	(0.126)	(0.252)	(0.199)
Invest t	0.401***	0.624***	-0.237	0.861***
	(0.101)	(0.128)	(0.238)	(0.191)
Invest t-1	-0.108	0.070	0.442**	-0.372**
	(0.113)	(0.112)	(0.173)	(0.146)
Δ Cash t	-0.112**	-0.011	-0.232*	0.221**
	(0.045)	(0.028)	(0.125)	(0.091)
Δ Cash t-1	-0.015	-0.062	-0.028	-0.034
	(0.016)	(0.049)	(0.042)	(0.046)
Dpr t	0.000	0.000***	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Dpr t-1	-0.000***	0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Cash t	0.016	-0.138	-0.023	-0.115
	(0.064)	(0.121)	(0.127)	(0.124)
Lev t	0.057	-0.170**	0.233	-0.403***
	(0.085)	(0.081)	(0.167)	(0.131)
Controls	YES	YES	YES	
Industry dummy	YES	YES	YES	
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Sargan-Hansen test (2-step)	0.113	0.395	0.651	
Arellano-Bond test AR(2)	0.346	0.098	0.691	
Observations	207699	92112	91195	

Source: Data Processing (2022) Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1

Table 5. The Effect of Economic Uncertainty on *Cash Holding Changes* under System Equations

	(1) Full	(2) Big	(3) Small	(4) Difference (Big-Small)
Uncertainty	0.002**	0.033**	0.098**	-0.065*
	(0.001)	(0.015)	(0.047)	(0.035)
Δ Cash t-1	0.688***	0.799***	-0.095	0.894***
	(0.118)	(0.290)	(0.236)	(0.265)
Invest t	-3.859**	1.961*	8.345	-6.384
	(1.671)	(1.179)	(6.650)	(4.760)
Invest t-1	0.294	-0.850	1.623	-2.472
	(0.351)	(0.821)	(1.775)	(1.380)
Δ Lev t	-0.466***	0.078	-2.651*	2.729*
	(0.161)	(0.313)	(1.407)	(1.016)
Δ Lev t-1	0.230	-0.439	1.163**	-1.601***
	(0.171)	(0.356)	(0.484)	(0.424)
Dpr t	0.000	-0.000*	0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Dpr t-1	0.000	-0.001	0.000	-0.001**
	(0.000)	(0.001)	(0.000)	(0.000)
Cash t	0.465***	1.407	-3.635**	5.042***
	(0.154)	(1.018)	(1.771)	(1.442)
Controls	YES	YES	YES	YES
Industry dummy	YES	YES	YES	
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Sargan-Hansen test (2-step)	0.361	0.084	0.240	
Arellano-Bond test AR(2)	0.499	0.772	0.241	
Observations	169107	75458	74383	

Source: Data Processing (2022) Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1

Table 6. The Effect of Economic Uncertainty on *Dividend Payout* under System Equations

	(1) Full	(2) Big	(3) Small	(4) Difference (Big-small)
Uncertainty	-0.011***	-0.039	0.303	-0.342
	(0.003)	(0.027)	(0.333)	(0.234)
Dpr $_{t-1}$	-0.004***	0.002	0.003	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Invest $_{t}$	-1.355	2.696	6.364	-3.668
	(1.186)	(2.909)	(6.635)	(5.087)
Invest $_{t-1}$	-1.760	-3.725	2.477	-6.202
	(1.184)	(2.453)	(8.549)	(6.234)
Δ Cash $_{t}$	-0.466*	-2.330***	-2.784	0.454
	(0.238)	(0.668)	(1.741)	(1.309)
Δ Cash $_{t-1}$	-2.402***	-0.317**	-2.137	1.819*
	(0.401)	(0.143)	(1.366)	(0.961)
Δ Lev $_{t}$	5.134***	5.379***	-7.727	13.106***
	(0.869)	(1.153)	(5.027)	(3.613)
Δ Lev $_{t-1}$	1.046**	1.819**	2.168	-0.348
	(0.517)	(0.913)	(3.916)	(2.817)
Controls	YES	YES	YES	YES
Industry dummy	YES	YES	YES	
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Sargan-Hansen (2step)	0.1106	0.4036	0.1839	
Arellano-Bond test AR(2)	0.8182	0.9625	0.4073	
Observations	234414	105509	101290	

Source: Data Processing (2022) *Standard errors are in parentheses. *** p<.01, ** p<.05, * p<.1*

Discussion

Financially constrained and unconstrained firms are divided based on the company size. Table 3 shows that economic uncertainty has a negative impact on the firm's investment, and these results are consistent with previous research (Chen et al., 2020; Çolak et al., 2018b). It boosts the value of delay options, and firms tend to postpone investment decisions. Columns (2) to (4) in Table 3 show that economic uncertainty has negative and significant influences on the investment of financially constrained and unconstrained firms. This is consistent with Chen et al. (2020). It was emphasized that the investment of financially constrained firms tends to decrease sharply with increased uncertainty.

Meanwhile, economic uncertainty has a statistically insignificant effect on the investment of financially constrained and unconstrained firms. Initially, cash

holdings had a negative effect on investment, but it has a positive association with this variable presently. Leverage and dividend do not consistently affect investments when applying the system equations approach. Table 4 shows the effect of economic uncertainty on leverage changes. An increase in uncertainty tends to reduce firms' leverage. This finding is consistent with the arguments of Çolak et al.,(2018) that uncertainty increases market frictions, thereby reducing the accessibility of the firm to external financing. However, there is no difference between the reduced leverage of financially constrained and unconstrained firms. Based on the equation system, the current investment of financially unconstrained firms tends to increase more than the constrained ones. The effect of current and one lag investment policies on the leverages of financially constrained and unconstrained firms differs significantly. It is difficult to interpret since current and one lag investment positively and negatively affect leverage change. A change in current cash holding tends to reduce the leverage of both firm types. However, its effect on financially constrained firms is stronger than that of unconstrained, and its difference is statistically significant. This indicates that financially constrained firms rely on cash holdings rather than external funding. Table 5 shows the effect of uncertainty on cash holdings.

As shown in column (1), firms tend to raise their cash holdings with increased economic uncertainty. This is consistent with the findings of Duong et al. (2020). Equations (2) to (4) in the table imply that economic uncertainty strongly motivates financially constrained firms to hoard cash. This research reconfirmed that financially constrained firms value cash holdings, especially when faced with a surge of economic uncertainty. Based on simultaneous equations, other financial policies strongly impact cash holdings (Gatchev et al., 2010; Kirch and Terra, 2019). The current investment and leverage change has a significant effect on cash holdings.

Meanwhile, the dividend has an insignificant impact on cash holdings change. Leverage change and level, including dividends for financially constrained and unconstrained firms, affect the cash holdings' change. Table 6 shows the significant and negative effect of economic uncertainty on dividend payout. This contradicts the findings of Attig et al. (2021) that economic policy positively affects dividend payment since it mitigates conflicts of interest and uncertainty. It was argued that these variables are mainly related to government regulations and differ from macroeconomic uncertainty. However, the negative association between economic uncertainty and dividend payment under surge may trigger cash holdings (Breuer et al., 2017). When the increase of the value of cash holdings is more dominant than the mitigation of agency conflicts, it negatively affects the economic certainty and uncertainty of the dividend payment. However, the standard errors associated with economic uncertainty and dividend payment for financially constrained firms become huge with an insignificant coefficient. In other words, economic uncertainty has varying effects on financially constrained firms' dividends. This is related to the dividend payout tendency of the sample. Based on yearly

observation, more than 75% of firms do not pay dividends. The small or financially constrained ones have a higher tendency not to pay a dividend. Other financial policies influence dividend payment. Changes in cash holdings and leverage have significant effects on dividend payment, as shown in column (4) in Table 6. Tables 3 to 6 show that current and previous financial policies are interrelated. These results are consistent with Modigliani and Miller (1958), Gatchev et al. (2010), and Kirch and Terra (2019).

Robustness Tests

This section explains the robustness test results of the Effects of uncertainty on investment and financial policy of financially constrained and unconstrained firms. Table 7a shows the effects of uncertainty on investment. These results support Table 3 and are consistent with previous findings (Gatchev et al., 2010; Kirch and Terra, 2019).

Table 7a. Robustness Test: Effect of the Uncertainty on Investment under System Equations

	(1) Invest (Full)	(2) Unconstraint	(3) Constraint	(4) Difference (Big-Small)
Uncertainty	-0.000	-0.009***	-0.000	-0.009***
	(0.000)	(0.003)	(0.003)	(0.003)
Invest t-1	0.366***	0.506***	0.213**	0.292***
	(0.061)	(0.112)	(0.104)	(0.109)
Δ Cash t	-0.042	-0.034	-0.002	-0.032
	(0.036)	(0.050)	(0.018)	(0.042)
Δ Cash t-1	-0.043***	-0.039**	-0.013*	-0.027*
	(0.013)	(0.018)	(0.007)	(0.015)
Dpr t	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Dpr t-1	0.001	0.000	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.000)
Δ Lev t	-0.158*	-0.118	0.113	-0.232
	(0.093)	(0.242)	(0.086)	(0.204)
Δ Lev t-1	-0.013	-0.037	0.027	-0.064
	(0.031)	(0.054)	(0.033)	(0.048)
Cash t	0.040**	-0.274***	0.024	-0.297***
	(0.016)	(0.095)	(0.088)	(0.093)
Lev t	-0.007	-0.147**	-0.006	-0.141**
	(0.008)	(0.073)	(0.016)	(0.061)
Controls	YES	YES	YES	YES
Industry dummy	YES	YES	YES	
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Arellano-Bond	0.0000	0.0000	0.0000	

test AR(1)				
Observations	170134	86046	42370	

Source: Data Processing (2022) Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1

Equations (2) to (4) in Table 7b show the varying effect of uncertainty on the leverage change of financially constrained and unconstrained firms. The system of the equation shows consistent interrelation among financial policies. The current investment, level of cash holdings, and leverage have varying effects on financially constrained and unconstrained firms.

Table 7b. Robustness Test: Effect of the Uncertainty on the Leverage Change under System Equations

	(1) Leverage (Full)	(2) Unconstraint	(3) Constraint	(4) Difference (Big-Small)
Uncertainty	-0.001***	-0.000	-0.002**	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Δ Lev t-1	0.238	-0.092	0.137	-0.045
	(0.167)	(0.058)	(0.157)	(0.102)
Invest t	0.401***	0.014	0.721	-0.708***
	(0.101)	(0.086)	(0.517)	(0.303)
Invest t-1	-0.108	0.142	-0.244	0.386*
	(0.113)	(0.093)	(0.324)	(0.200)
Δ Cash t	-0.112**	-0.013	-0.308	0.294
	(0.045)	(0.043)	(0.325)	(0.189)
Δ Cash t-1	-0.015	-0.003	0.026	-0.029
	(0.016)	(0.016)	(0.074)	(0.044)
Dpr t	0.000	0.000**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Dpr t-1	-0.000***	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Cash t	0.016	-0.013	0.290*	-0.303***
	(0.064)	(0.081)	(0.170)	(0.118)
Lev t	0.057	-0.146**	0.031	-0.177***
	(0.085)	(0.066)	(0.082)	(0.072)
Controls	YES	YES	YES	YES
Industry dummy	YES	YES	YES	
Country dummy	YES	YES	YES	
Year dummy	YES	YES	YES	
Sargan-Hansen test (2-step)	0.113	0.395	0.494	
Arellano-Bond	0.346	0.098	0.819	

test AR(2)			
Observations	207699	104514	50202

Standard errors are in parentheses. *** p<.01, ** p<.05, * p<.1

Conclusion

The varying effects of economic uncertainty on investment and financial policies of the financially constrained and unconstrained firms were investigated using a system of equations. It was proven that this variable has negative effects. Irrespective of the fact that it is more on financially constrained firms than the unconstrained, it only exhibits an insignificant difference. This happens because firms tend to postpone their investment decision and prefer holding cash when uncertainty increases. Moreover, our result also shows that increasing economic uncertainty creates stronger motivation for financially constrained firms to hold more excess cash than unconstrained firms. This result supports the idea that financially constrained firms treat cash holdings as more valuable than financially unconstrained firms when economic uncertainty increases. The economic uncertainty also negatively affects the leverage changes and dividend payments, but the difference is insignificant.

Meanwhile, it strongly motivates financially constrained firms to hoard cash holdings. Another result shows that uncertainty has a negative effect towards leverage. It means, firms try to reduce their leverage when economic uncertainty increases on both constrained and unconstrained firms. When uncertainty increases, firms face difficulty getting external funding. However, the negative association between economic uncertainty and dividend payment under a surge of economic uncertainty may be related to increased cash holdings' value (Breuer et al. 2017). If the increase of the value of cash holdings is more dominant than the mitigation of agency conflicts under the surge of general economic uncertainty, economic uncertainty negatively affects the dividend payment. From this study, we can conclude that the impact of uncertainty towards investment, cash holdings and dividend payment between financially constrained and unconstrained firms did not show significant differences. It means this interdependency relationship can be generalized towards firms on any financial condition.

References

Agliardi, E., Agliardi, R. and Spanjers, W., (2016). Corporate financing decisions under ambiguity: Pecking order and liquidity policy implications. *Journal of Business Research*, *69*(12), 6012–6020.

Ahir, H., Bloom, N. and Furceri, D., (2018). The World Uncertainty Index. Working Paper

Alhudhaif, E., (2021). *Corporate Payout and Economic Policy Uncertainty in the US*. Working Paper. Darla Moore School of Business, University of South Carolina.

Altman, E. I., (2005). An emerging market credit scoring system for corporate bonds. *Emerging Markets Review*, *6*(4), 311–323.

Attig, N., El Ghoul, S., Guedhami, O. and Zheng, X., (2021). Dividends and economic policy uncertainty: International evidence. *Journal of Corporate Finance*, *66*, 101785.

Baum, C. F., Stephan, A. and Talavera, O., (2009). The effects of uncertainty on the leverage of nonfinancial firms. *Economic Inquiry*, *47*(2), 216–225.

Bolton, P., Wang, N. and Yang, J., (2019). Investment under uncertainty with financial constraints. *Journal of Economic Theory*, *184*, 1–58.

Bordo, M. D., Duca, J. V. and Koch, C., (2016). Economic policy uncertainty and the credit channel: Aggregate and bank level U.S. evidence over several decades. *Journal of Financial Stability*, *26*, 90–106.

Boyle, G. W., Guthrie, G. A., (2003). Investment , Uncertainty , and Liquidity. *The Journal of Finance*, *58*(5), 2143–2166.

Breuer, W., Rieger, M. O. and Soypak, K. C., (2017). Corporate cash holdings and ambiguity aversion. *Review of Finance*, *21*(5), 1933–1974.

Chen, X., Le, C. H. A., Shan, Y. and Taylor, S., (2020). Australian policy uncertainty and corporate investment. *Pacific Basin Finance Journal*, *61*.

Çolak, G., Durnev, A. and Qian, Y., (2017). Political uncertainty and IPO activity: Evidence from U.S. gubernatorial elections. *Journal of Financial and Quantitative Analysis*, *52*(6).

Çolak, G., Gungoraydinoglu, A. and Öztekin, Ö., (2018). Global leverage adjustments, uncertainty, and country institutional strength. *Journal of Financial Intermediation*, *35*(October 2016), 41–56.

Delaney, L., (2022). The impact of operational delay on irreversible investment under Knightian uncertainty. *Economics Letters*, *215*, 110494.

Denis, D. J., and Sibilkov, V. (2010). Financial constraints, investment, and the value of cash holdings. *Review of Financial Studies*, *23*(1), 247–269.

Diamond, D. W., Verrecchia, R. E., (1991). Disclosure, Liquidity, and the Cost of Capital. *Journal of Finance*, *46*(4), 1325–1359.

Djankov, S., Hart, O., Mcliesh, C. and Shleifer, A., (2008). Debt Enforcement around the World Debt Enforcement around the World Caralee McLiesh Andrei Shleifer. *Journal of Political Economy*, *116*(6), 1105–1149.

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*, *62*(March), 101607.

Fachrudin, K. A., Pirzada, K. and Iman, M. F., (2022). The role of financial behavior in mediating the influence of socioeconomic characteristics and neurotic personality traits on financial satisfaction. *Cogent Business and Management*, *9*(1), 2080152.

Fazzari, S., Hubbard, G. and Petersen, B. C., (1988). Financing constraints and corporate investment. Brookings Papers on Economic Activity.

Francis, B. B., Hasan, I. and Zhu, Y., (2014). Political uncertainty and bank loan contracting. *Journal of Empirical Finance*, *29*, 281–286.

Gatchev, V. A., Pulvino, T. and Tarhan, V., (2010). The interdependent and intertemporal nature of financial decisions: An application to cash flow sensitivities. *Journal of Finance*, *65*(2), 725–763.

Gilchrist S., Sim J. W. and Zakrajšek, E., (2014). Uncertainty, Financial Frictions, and Investment Dynamics. *National Bureau of Economic Research*.

Goodell, J. W., Goyal, A. and Urquhart, A., (2021). Uncertainty of uncertainty and firm cash holdings. *Journal of Financial Stability*, *56*(July), 100922.

Gulen, H., and Ion, M., (2016). Policy uncertainty and corporate investment. *Review of Financial Studies*, *29*(3), 523–564.

Harford, J., Klasa, S. and Maxwell, W. F., (2014). Refinancing risk and cash holdings. *Journal of Finance*, *69*(3), 975–1012.

Im, H. J., Kang, Y. and Shon, J., (2020). How does uncertainty influence target capital structure? *Journal of Corporate Finance*, *64*(May), 101642.

Im, H. J., Park, H. and Zhao, G., (2017). Uncertainty and the value of cash holdings. *Economics Letters*, 155, 43–48.

Kaviani, M. S., Kryzanowski, L., Maleki, H. and Savor, P., (2020). Policy uncertainty and corporate credit spreads. *Journal of Financial Economics*, *138*(3), 838–865.

Kim, H., Kung, H., (2017). The asset redeployability channel: How uncertainty affects corporate investment. *Review of Financial Studies*, *30*(1), 245–280.

Kirch, G., Terra, P. R., (2019). Financial constraints and the interdependence of corporate financial decisions: A cross-country study. *RAUSP Management Journal*, *55*(3), 339–354.

Lambrecht, B. M., Myers, S. C., (2017). The dynamics of investment, payout and debt. *Review of Financial Studies*, *30*(11), 3759–3800.

Li, S., Hoque, H. and Thijssen, J., (2021). Firm financial behaviour dynamics and interactions: A structural vector autoregression approach. *Journal of Corporate Finance*, *69*(March 2018), 102028.

Liu, G., Zhang, C., (2020). Economic policy uncertainty and firms' investment and financing decisions in China. *China Economic Review*, *63*(February).

Makosa, L., Jie, S., Bonga, W. G., Jachi, M. and Sitsha, L., (2021). Does economic policy uncertainty aggravate financial constraints? *South African Journal of Accounting Research*, *35*(2), 151–166.

Modigliani, F., Miller, H. M., (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, *48*(3), 261–297.

Neamtiu, M., Shroff, N., White, H. D. and Williams, C. D., (2014). The impact of ambiguity on managerial investment and cash holdings. *Journal of Business Finance and Accounting*, *41*(7–8), 1071–1099.

Nguyen, D. N., Nguyen, C. P. and Dang, L. P. X., (2022). Uncertainty and corporate default risk: Novel evidence from emerging markets. *Journal of International Financial Markets, Institutions and Money*, *78*(May), 101571.

Novy-Marx, R., (2007). An equilibrium model of investment under uncertainty. *Review of Financial Studies*, *20*(5), 1461–1502.

Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R., (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics*, *52*(1), 3–46.

Pástor, Ľ., Veronesi, P., (2012). Uncertainty about Government Policy and Stock Prices. *Journal of Finance*, *67*(4), 1219–1264.

Phan, H. V., Nguyen, N. H., Nguyen, H. T. and Hegde, S., (2019). Policy uncertainty and firm cash holdings. *Journal of Business Research*, *95*(October 2018), 71–82.

Sarwar, B., Ming, X. and Husnain, M., (2020). Economic policy uncertainty and dividend sustainability: new insight from emerging equity market of China. *Economic Research-Ekonomska Istrazivanja* , *33*(1), 204–223.

Tran, D. V., (2020). Economic policy uncertainty and bank dividend policy. *International Review of Economics*, *67*(3), 339–361.

Tran, Q. T., (2021). Economic policy uncertainty and cost of debt financing: International evidence. *North American Journal of Economics and Finance*, *57*(March), 101419.

Viviani, J. L., Lai, A. N., and Louhichi, W., (2018). The impact of asymmetric ambiguity on investment and financing decisions. *Economic Modelling*, *69*(January), 169–180.

Walkup, B., (2016). The impact of uncertainty on payout policy. *Managerial Finance*, *42*(11), 1054–1072.

Xu, Z., (2020). Economic policy uncertainty, cost of capital, and corporate innovation. *Journal of Banking and Finance*, *111*.

WPŁYW NIEPEWNOŚCI I WSPÓŁZALEŻNOŚCI EKONOMICZNEJ NA INWESTYCJE ORAZ DECYZJE FINANSOWE

Streszczenie: Niniejsze badanie analizuje wpływ niepewności na decyzje finansowe i inwestycyjne spółek notowanych na giełdzie w Australii, Indonezji, Malezji, Singapurze, Korei Południowej i na Tajwanie w latach 1996-2020. Wcześniejsze badania wykorzystywały podejścia oparte na pojedynczych równaniach do badania wpływu niepewności na decyzje finansowe lub inwestycyjne, co doprowadziło do pominięcia zmiennych, ponieważ decyzje inwestycyjne i finansowe są współzależne. Autorzy stosują dwuetapowy system GMM, aby wyeliminować jednoczesne odchylenia systemu równań i dynamiczną współzależność decyzji inwestycyjnych i finansowych. Wyniki pokazują, że niepewność ekonomiczna wpływa w różny sposób na politykę inwestycyjną i finansową firm z ograniczeniami i firm bez ograniczeń. Niepewność gospodarcza motywuje firmy z ograniczeniami finansowymi do zwiększania zasobów gotówki w większym stopniu niż firmy bez ograniczeń.

Słowa kluczowe: Niepewność ekonomiczna, współzależność, firmy z ograniczeniami finansowymi