Independent directors and corporate investment: evidence from an emerging market

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Abstract

Purpose – The purpose of this paper is to examine whether independent directors reduce corporate overinvestment and improve investment efficiency in an emerging market.

Design/methodology/approach – First, the author developed a research model in which corporate investment is a function of Tobin's Q, the proportion of independent directors in the board and an interaction between them. Second, the author divided the full sample into groups of firms with a low- and high-financial constraint to compare the effects of independent directors between financially unconstrained and constrained firms.

Findings – With a full sample of 1,281 observations collected from 193 firms listed in Ho Chi Minh Stock Exchange during the period from 2009 to 2017, the author find that the proportion of independent directors is negatively related to firm investment but its interactive term with Tobin's Q is positively related to corporate investment. These findings imply that independent directors can help firms reduce overinvestment and improve investment efficiency. Moreover, the research findings indicate that these effects of independent directors are stronger for financially constrained firms.

Originality/value – The extant literature shows that independent directors are an effective mechanism to reduce agency problems in firm decisions and operating performance. However, there has been no research on the role of independent directors in corporate investment policy.

Keywords Vietnam, Emerging market, Independent directors, Corporate investment

Paper type Research paper

1. Introduction

Corporate governance is one of the most interesting topics in corporate finance. Due to information asymmetry, firm managers tend to take advantage of corporate resources in order to serve their own interest rather than serving shareholders' benefits. Particularly, firm managers conduct overinvestment in unprofitable business projects that increase their wealth and sacrifice firm owners' interest (Jensen and Meckling, 1976). Realizing this agency problem, shareholders use many mechanisms to control and monitor managers and make their behavior and firm benefits align. Recently, independent directors have become a common approach of corporate governance after the global financial crisis, which revealed severe weaknesses in corporate governance systems across countries. The extant literature shows that independent directors positively influence firm decisions (Weisbach, 1988) and financial performance (Brickley *et al.*, 1994; Choi *et al.*, 2007; Chou *et al.*, 2010; Dahya and McConnell, 2007; Ezzamel and Watson, 1993; Joh and Jung, 2012; Klein, 2002; Liu *et al.*, 2015). However, there are no specific studies on how independent directors affect corporate investment. In this paper, we examine whether independent directors reduce corporate overinvestment and improve investment efficiency in an emerging market.

Vietnam's stock market is young, having been launched in 2000. Therefore, investors fail to have adequate knowledge and experience to control managers. In addition, legislation on corporate governance is not binding firms strictly. Regulations on the minimum number of independent directors stipulated in Circular No. 121/2012/TT-BTC (The Ministry of Finance, 2012) and Decree No. 71/2017/ND-CP (Government, 2017) have not been adhered to by many listed firms, since there are no effective remedies for violations. Therefore, employing independent directors is at a firm's discretion. This is a good opportunity to examine the role of independent directors in corporate investment behavior.

First, we developed a research model in which corporate investment is a function of Tobin's Q, the proportion of independent directors in the board and an interaction between them. Control variables include firm profitability, financial leverage, cash holdings, firm size and state ownership. Second, we divided the full sample into groups of firms with low and high financial constraint to compare the effects of independent directors between financially unconstrained and constrained firms. Financial constraint measures used are the Kaplan and Zingales (1997) index, financial leverage and payout ratio. With a full sample of 1,281 observations collected from 193 firms listed in the Ho Chi Minh Stock Exchange during the period from 2009 to 2017, we find that the proportion of independent directors is negatively related to firm investment but its interactive term with Tobin's Q is positively related to corporate investment. These findings imply that independent directors can help firms reduce overinvestment and improve investment efficiency. Moreover, our research findings indicate that these effects of independent directors are stronger for financially constrained firms.

The rest of this paper is structured as follows. Section 2 presents the institutional environment of the Vietnamese stock market. Section 3 summarizes the extant literature on corporate governance, the role of board independence and develops the research hypotheses. Section 4 is about research design and data collection. Section 5 reports regression results. Section 6 presents conclusions.

2. Institutional environment
The Vietnamese stock market was launched in 2000 with the first stock exchange located in Ho Chi Minh City. Over the first five years, training activities in the market were not attractive with about 40 listed firms and market capitalization constituted approximately 1 percent of the gross domestic product (GDP). However, during the short period from 2006 to 2007, the Vietnamese stock market developed rapidly with over 300 listed companies in the two stock exchanges in Ho Chi Minh City and Hanoi. In 2007, the market capitalization reached 43 percent of GDP. After two booming years, the market started to decline in 2008 and this decline was stronger under the impact of the global financial crisis. As in many countries, the collapse of the Vietnamese financial market during the crisis period disclosed many weaknesses in corporate governance. Therefore, the Vietnamese Government focused on legislation for the corporate governance of public firms. Circular No. 121/2012/TT-BTC (The Ministry of Finance, 2012), which was issued by the Ministry of Finance in July 2012 and came into force in the same year, required public firms to have independent directors accounting for at least one third of the board. However, most listed firms failed to follow this requirement. Then, the Government (2017) issued Decree No. 71/2017/ND-CP with the same requirement for independent directors on the boards of listed firms. Firms failing to have enough independent directors would be fined from 70 to 100m Vietnamese dong (VND) in accordance with Decree No. 145/2016/ND-CP (Government, 2016) on penalties for administrative violations against regulations of the securities and securities market. Nevertheless, this fine has not been effective enough to force listed firms to adhere to the legislation, and there are still about 60 percent of the listed firms without independent directors now. According to Clause 2 Article 151 of

Law No. 68/2014/QH13 (The National Assembly, 2014) on enterprises, independent directors are defined as follows:

- not working for the firm or a subsidiary of the firm, and not having worked for the firm or a subsidiary of the firm within the last three consecutive years;

- not receiving salaries and/or remuneration from the firm, except income from independent directors' allowances;

- not having a spouse, natural father/mother or adoptive father/mother or natural child or adopted child or sibling who is a large shareholder or is a manager of the firm or a subsidiary of the firm;

- not holding directly or indirectly at least 1 percent of the voting shares of the firm; and

- not having been a member of the board or the supervisory committee of the firm within the last five consecutive years.

3. Literature review and hypothesis development

According to Berle and Means (1932), when firms are larger, their ownership structure becomes more diverse and complicated. Firm owners face more difficulties in running businesses and they hire managers that are agents operating the firms on their behalf. This is an agency relationship in which managers are agents and shareholders are principals. However, since shareholders fail to have enough information on business activities, managers tend to divert firm resources to serve their personal interest and sacrifice shareholders' wealth (Jensen and Meckling, 1976). There are many approaches that shareholders can employ to monitor firm managers and make sure that managers' behavior is aligned with shareholders' benefits. First, firms pay managers based on firm performance or grant them a certain number of shares. When firm performance is higher, managers' incomes are also higher due to higher payment or stock prices. Second, firms dismiss managers when firm performance is lower than an expected level or they create negative effects on firm performance. Third, firms employ external auditing services or establish internal controlling systems with supervisory boards, internal regulations and independent directors. Independent directors that have no private or business relationship with managers can monitor managers' behavior and protect shareholders' wealth effectively (Knyazeva et al., 2013). Besides, independent directors with their own professional knowledge and experience are helpful to firms. Independent directors also function as professional consultants to make better corporate decisions and improve firm performance (Kim et al., 2014).

Prior studies document that the presence of independent directors on boards positively affects firm decisions and operating performance. Weisbach (1988) investigates the role of independent directors in chief executive officer (CEO) turnover in the USA market and finds that the likelihood of CEO turnover due to bad firm profitability or market value is higher if independent directors dominate the board with 60 percent of the board members. Chou et al. (2010) find that independent directors of firms with higher financial distress have less work effort to control financial leverage. Chen and Chuang (2009) document that board independence leads to higher levels of cash holdings since shareholders consider independent directors as watchdogs to mitigate agency problems. In addition, Schwartz-Ziv and Weisbach (2013) analyze the minutes of the board meetings of firms and point out that an independent director's function is monitoring managers' behavior. Brickley et al. (1994), Klein (2002) examines how independent directors work in US firms and shows that they serve shareholders' wealth growth. Dahya and McConnell (2007) investigate how

government regulations on independent directors affect firm performance in the UK during the 1989–1996 period when the Cadbury Report requested a minimum number of three independent directors to become effective. Their research results show that followers of this recommendation experience considerable increases in their absolute profitability and relative profitability compared with different peer group benchmarks. In addition, Ezzamel and Watson (1993) also document a positive effect of independent directors on firm performance in the UK. In New Zealand, Hossain *et al.* (2001) show that the positive association between the use of independent directors and operating performance is stable despite changes in the legislation on enterprises and financial statements. Choi *et al.* (2007) analyze the influence of independent directors on market value when the corporate governance regulations requiring independent directors came into force after the East Asian crisis. They find that the presence of independent directors is positively related to firm value. Furthermore, Liu *et al.* (2015) document that independent directors can help Chinese firms control insider self-dealing and increase corporate investment efficiency. Interestingly, Zhu *et al.* (2016) show that firm value is higher when independent directors have higher rankings. Independent directors with higher rankings are more effective in controlling the management, and these rankings negatively affect earnings management.

Apart from the number or fraction of independent directors in the board, several prior studies show that their characteristics also affect firm performance. According to Becker (2009), human capital consists of knowledge, information, ideas, skills and personal health, which are reflected by the age and educational level. Leibenstein (1957) posits that the educational level of directors positively affects firm performance, but this relationship is weaker when directors are older. Kor and Sundaramurthy (2009), using a research sample including high-tech firms, find that independent directors with more industry-specific management experience and firm-specific launching experience strongly affect firm growth. However, these directors may have negative effects on firm performance if they fail to have expertise in the industry. Reguera-Alvarado and Bravo (2017) document that positive effects of independent directors on firm performance only exist in a certain period during their tenure. These effects are weaker when their tenure is longer. Moreover, Wang (2015) finds that privately controlled firms listed in China are more likely to outperform their counterparts if they have independent directors with political ties. Politically connected directors help firms have better access to external funds and receive more subsidies granted by the government.

In Vietnam, the role of board independence in firm performance is mixed. Duc and Thuy (2013), using a sample of 77 listed firms over the period from 2011 to 2016, find that the relationship between the use of independent directors and firm performance is insignificant. Nevertheless, Vo and Nguyen (2014) document that the presence of independent directors is negatively related to firm performance with a larger sample of 177 firms listed between 2008 and 2012. In this paper, we analyze how independent directors mitigate agency problems via corporate investment decisions and investment efficiency. Xiao (2013) investigates the relationship between shareholder protection and corporate research and development (R&D) investment across countries. They find that shareholder rights can reduce firms' R&D overinvestment. In line with the agency theory, we hypothesize that independent directors can help firms reduce overinvestment and improve investment efficiency:

H1. The fraction of independent directors in the board is positively related to corporate investment and negatively associated with corporate investment efficiency.

4. Research methods
4.1 Research models
Following Chen *et al.* (2017), we employ corporate investment as a function of the Tobin's *Q*, board independence and their interaction. Control variables are firm profitability, financial

leverage, cash holdings, firm size, state-controlled firm dummy, industry dummies and year dummies. Firms with higher profitability are more likely to have a higher cash flow and thus they tend to increase investment. Financial leverage is a signal of financial constraint; firms with higher financial leverage have worse access to external funds; and their investments are restricted. In addition, cash holdings are a main source of internal finance; therefore, cash holdings positively affect corporate investment (Opler *et al.*, 1999; Ozkan and Ozkan, 2004). Larger firms with good reputation are able to raise external funds with lower costs and tend to have higher investment than smaller ones. Moreover, state-controlled firms are likely to follow political aims beside economic efficiency (Yang *et al.*, 2017); hence, they may have lower corporate investment. Finally, industry dummies and year dummies are added to control both industry and time effects:

$$\begin{aligned} \mathrm{INV}_t = {} & \alpha + \beta_1 \mathrm{TOB}_{t-1} + \beta_2 \mathrm{IND}_t + \beta_3 \mathrm{TOB}_{t-1} \times \mathrm{IND}_t + \beta_4 \mathrm{ROA}_{t-1} \\ & + \beta_5 \mathrm{LEV}_{t-1} + \beta_6 \mathrm{CAS}_{t-1} + \beta_7 \mathrm{SIZ}_{t-1} + \beta_8 \mathrm{SOE}_t \\ & + \delta \ \text{Industry dummies} + \eta \ \text{Year dummies} + \varepsilon, \end{aligned} \quad (1)$$

where INV_t is corporate investment in year t; TOB_{t-1} is Tobin's Q in year $t-1$; IND_t is board independence in year t; ROA_{t-1} is firm profitability in year $t-1$; LEV_{t-1} is financial leverage in year $t-1$; CAS_{t-1} is cash holdings in year $t-1$; SIZ_{t-1} is firm size in year $t-1$; and SOE_t is state ownership dummy in year t. Definitions of these variables are presented in Table I. Coefficients of Tobin's Q and its interactive term with board independence (i.e. β_1 and β_3) are expected to be positive, while board independence's coefficient is expected to be negative.

To ensure the robustness of our research findings, we employ three regression approaches to estimate Equation (1), namely, pooled ordinary least squares (OLS), fixed effects and random effects. According to Baltagi (2008) and Wooldridge (2010), compared with pool OLS, fixed effects and random effects have some advantages: increasing sample size, capturing heterogeneity related to both in cross-section units and time dimensions, and testing hypotheses of heteroscedasticity or autocorrelation.

4.2 Data collection and description

We construct our research sample from non-financial firms listed on the Ho Chi Minh City Stock Exchange. Research information presented in financial statements and state ownership are collected from the Stoxplus database. The fraction of independent directors is hand-collected. After observations with missing information are removed, we obtain a final research sample with 1,281 firm-years from 193 firms over the period from 2009 to 2017.

Table II presents the research data description. Panel A shows that the number of firms in the sample increases gradually over the research period. In 2009, there are 78 firms and this figure reaches 185 in 2017. In addition, the distribution of observations by industry, grouped by The Industry Classification Benchmark reported in Panel B, shows that

Variables	Variable names	Definitions
INV	Corporate investment	Capital expenditure deflated by total assets
TOB	Tobin's Q	Market value of equity plus book value of debt deflated by total assets
IND	Board independence	Fraction of independent directors in the board
ROA	Firm profitability	Return on assets
LEV	Financial leverage	Total liabilities deflated by total assets
CAS	Cash holdings	Cash and equivalents deflated by total assets
SIZ	Firm size	Natural logarithm of total assets
SOE	State-controlled firm	A dummy variable assigned 1 if at least 50% of shares are held by government agencies and 0 otherwise

Table I.
Variable definitions

A: sample distribution by year					
Year	n	%	Year	n	%
2009	78	6.09	2014	154	12.02
2010	108	8.43	2015	165	12.88
2011	128	9.99	2016	176	13.74
2012	139	10.85	2017	185	14.44
2013	148	11.55			

B: sample distribution by ICB industry					
Industry	n	%	Industry	n	%
Technology	30	2.3	Health Care	66	5.2
Industrials	485	37.9	Consumer Goods	315	24.6
Oil and Gas	14	1.1	Basic Materials	184	14.4
Consumer Services	77	6.0	Utilities	110	8.6

C: descriptive statistics of research variables					
	Mean	Median	SD	Min.	Max.
INV_t	0.03	0.02	0.02	0.00	0.09
TOB_{t-1}	1.02	0.93	0.44	0.34	2.39
IND_t	0.13	0.00	0.20	0.00	0.83
ROA_{t-1}	0.07	0.06	0.07	−0.03	0.26
LEV_{t-1}	0.48	0.51	0.21	0.09	0.84
CAS_{t-1}	0.15	0.11	0.13	0.01	0.52
SIZ_{t-1}	27.61	27.40	1.16	25.81	30.55
SOE_t	0.24	0.00	0.43	0.00	1.00

Notes: INV_t is corporate investment measured by capital expenditure deflated by total assets in year t. TOB_{t-1} is Tobin's Q measured by market value of equity plus book value of debt deflated by total assets in year $t-1$. IND_t is board independence measured by the fraction of independent directors in the board in year t. ROA_{t-1} is firm profitability measured by return on assets in year $t-1$. LEV_{t-1} is financial leverage measured by total liabilities deflated by total assets in year $t-1$. CAS_{t-1} is cash holdings measured by cash and equivalents deflated by total assets in year $t-1$. SIZ_{t-1} is firm size measured by the natural logarithm of total assets in year $t-1$. SOE_t is a state ownership dummy assigned 1 if at least 50 percent of shares are held by government agencies and 0 otherwise in year t

Table II.
Data description

industrials contribute the largest percentage of firm-years in the research data with 37.9 percent, while oil and gas is the smallest industry with only 1.1 percent. Consumer goods is the second largest with 24.6 percent, followed by basic materials (14.4 percent) and utilities (8.6 percent). Technology, health care and consumer services constitute 2–6 percent of the sample.

Moreover, Panel C illustrates descriptive statistics of key variables. To eliminate outliers' effects, we winsorize financial variables at 3 percent. Corporate investment ranges from 0 to 9 percent of total assets and its mean value is 3 percent. On average, Tobin's Q is 1.02 and return on assets is 7 percent. The fraction of independent directors on the board varies from 0 to 83 percent, and its mean and median are 13 and 0 percent, respectively. Corporate cash holdings constitute from 1 to 52 percent of total assets. Besides, 24 percent of the observations in the research sample are from SOEs.

5. Research results
Table III presents a correlation matrix of key research variables. Corporate investment has positive correlation with Tobin's Q, return on assets and the SOE dummy, while it has a negative correlation with financial leverage. In addition, all correlation coefficients are lower than 0.5. These imply that there is no multicollinearity.

Table IV reports regression results of three models including pooled OLS, fixed effects and random effects. Tobin's Q is positively related to corporate investment in all models.

	INV	TOB	IND	ROA	LEV	CAS	SIZ
TOB$_{t-1}$	0.10*** (0.00)						
IND$_t$	−0.04 (0.16)	0.01 (0.77)					
ROA$_{t-1}$	0.15*** (0.00)	0.48*** (0.00)	0.00 (0.91)				
LEV$_{t-1}$	−0.11*** (0.00)	−0.09*** (0.00)	−0.06** (0.03)	−0.50*** (0.00)			
CAS$_{t-1}$	0.04 (0.17)	0.24*** (0.00)	0.05* (0.06)	0.47*** (0.00)	−0.37*** (0.00)		
SIZ$_{t-1}$	0.00 (0.92)	0.19*** (0.00)	−0.03 (0.30)	−0.14*** (0.00)	0.35*** (0.00)	−0.01 (0.64)	
SOE$_t$	0.25*** (0.00)	0.03 (0.37)	−0.04 (0.14)	0.08*** (0.00)	0.01 (0.61)	0.11*** (0.00)	0.05* (0.06)

Notes: INV$_t$ is corporate investment measured by capital expenditure deflated by total assets in year t. TOB$_{t-1}$ is Tobin's Q measured by market value of equity plus book value of debt deflated by total assets in year $t-1$. IND$_t$ is board independence measured by the fraction of independent directors on the board in year t. ROA$_{t-1}$ is firm profitability measured by return on assets in year $t-1$. LEV$_{t-1}$ is financial leverage measured by total liabilities deflated by total assets in year $t-1$. CAS$_{t-1}$ is cash holdings measured by cash and equivalents deflated by total assets in year $t-1$. SIZ$_{t-1}$ is firm size measured by the natural logarithm of total assets in year $t-1$. SOE$_t$ is the state ownership dummy assigned 1 if at least 50 percent of shares are held by government agencies and 0 otherwise in year t. *,**,***Significant at 10, 5 and 1 percent levels, respectively

Table III.
Correlation matrix

Variables	Pooled OLS	Fixed effects	Random effects
TOB_{t-1}	0.0019** (2.00)	0.0007*** (4.53)	0.0001*** (3.02)
IND_t	−0.0218*** (−2.59)	−0.0188*** (−2.74)	−0.0185*** (−2.78)
$IND_t \times TOB_{t-1}$	0.0169** (2.19)	0.0174*** (3.02)	0.0172*** (3.01)
ROA_{t-1}	0.0432*** (3.20)	−0.0151 (−1.30)	−0.0022 (−0.20)
LEV_{t-1}	−0.0118*** (−3.16)	−0.0074 (−1.51)	−0.0092** (−2.10)
CAS_{t-1}	−0.0224*** (−4.14)	−0.0291*** (−5.59)	−0.0246*** (−4.98)
SIZ_{t-1}	−0.0005 (−0.74)	−0.0002 (−0.14)	0.0002 (0.14)
SOE_t	0.0079*** (5.04)	0.0042** (2.02)	0.0062*** (3.32)
Intercept	0.0638*** (3.66)	0.0378 (1.17)	0.0497* (1.68)
Year dummies	Yes	No	Yes
Industry dummies	Yes	No	Yes
R^2	0.1927		
F-statistics	13.05***	6.25***	
Wald χ^2			89.98***
Number of observations	1,281	1,281	1,281

Notes: The dependent variable is corporate investment (INV_t) and is measured by capital expenditure deflated by total assets in year t. TOB_{t-1} is Tobin's Q measured by market value of equity plus book value of debt deflated by total assets in year $t-1$. IND_t is board independence measured by the fraction of independent directors in the board in year t. ROA_{t-1} is firm profitability measured by return on assets in year $t-1$. LEV_{t-1} is financial leverage measured by total liabilities deflated by total assets in year $t-1$. CAS_{t-1} is cash holdings measured by cash and equivalents deflated by total assets in year $t-1$. SIZ_{t-1} is firm size measured by the natural logarithm of total assets in year $t-1$. SOE_t is the state ownership dummy, assigned 1 if at least 50 percent of shares are held by government agencies and 0 otherwise in year t. *,**,***Significant at 10, 5 and 1 percent levels, respectively

Table IV.
Baseline regression
results

These findings indicate that firms with higher investment opportunities tend to have more investment. Moreover, there is a negative relationship between the fraction of independent directors and firm investment at the significance level of 1 percent. This implies that independent directors help firms mitigate agency problems. When managers are strictly controlled by independent directors, their overinvestment in unprofitable investment projects is limited. Remarkably, the interaction between board independence and Tobin's Q is positively associated to corporate investment. The explanation for this is that independent directors may work as watchdogs to monitor managers' behavior and professional consultants to improve firms' investment efficiency (Kim *et al.*, 2014; Zhu *et al.*, 2016). Firms with higher board independence are more efficient in their investment policies. These research findings are consistent with Hossain *et al.* (2001), Liu *et al.* (2015), Zhu *et al.* (2016) and contrary to Duc and Thuy (2013). In an emerging market like Vietnam, when corporate governance is weak, the role of independent directors in corporate governance is important to align managers' behavior and shareholder's benefits.

Furthermore, we extend our analysis by comparing the effects of board independence between financially constrained and unconstrained firms. In line with Almeida *et al.* (2004), we classify observations in the full sample into two sub-samples by the median values of financial constraint measures including Kaplan and Zingales (1997) index (KZ index), financial leverage and payout ratio. Observations have a high (low) KZ index if their index is higher (lower) than the year median. Observations have a high (low) leverage if their leverage is higher (lower) than the year median. Observations have a high (low) payout ratio if their ratio is higher (lower) than the year median. Observations with a high KZ index, high leverage and low dividend payout ratio are defined as financially constrained. Then, pooled OLS regression models are applied for each pair of sub-samples.

Table V presents the impacts of board independence on corporate investment by financial constraint. Regression results for both financially constrained and unconstrained groups

Variables	KZ index		Leverage		Payout ratio	
	Low	High	Low	High	High	Low
TOB$_{t-1}$	0.0045** (2.12)	0.0113* (1.71)	0.0023 (0.99)	0.0009 (0.23)	0.0048 (0.60)	0.0018* (−1.88)
IND$_t$	−0.0147 (−1.36)	−0.0552*** (−4.12)	−0.0159 (−1.54)	−0.0554*** (−3.36)	−0.0200* (−1.68)	−0.0221* (−1.71)
IND$_t$*TOB$_{t-1}$	0.0075 (0.83)	0.0605*** (4.36)	0.0085 (0.94)	0.0505*** (3.21)	0.0125 (1.26)	0.0222* (1.65)
ROA$_{t-1}$	0.0510*** (3.18)	0.1484*** (6.17)	0.0357** (2.05)	0.0275 (1.16)	0.0076 (0.38)	0.0362* (1.74)
LEV$_{t-1}$	−0.0167*** (−3.41)	−0.0108** (−2.05)	−0.0012 (−0.17)	−0.0209** (−2.51)	−0.0092 (−1.56)	−0.0067 (−1.40)
CAS$_{t-1}$	−0.0138*** (−2.22)	−0.0036 (−0.36)	−0.0284*** (−3.98)	−0.0059 (−0.70)	−0.0345*** (−5.05)	−0.0070 (−0.76)
SIZ$_{t-1}$	−0.0015* (−1.83)	0.0129*** (5.81)	−0.0016 (−1.63)	−0.0003 (−0.35)	−0.0037*** (−3.94)	0.0021** (2.47)
SOE$_t$	0.0020 (0.97)	0.0006 (0.68)	0.0085*** (3.59)	0.0084*** (4.03)	0.0043** (2.01)	0.0102*** (s4.13)
Intercept	0.0866*** (3.77)	0.0190 (1.61)	0.0957*** (3.55)	0.0608*** (2.60)	0.1651*** (6.24)	−0.0167 (−0.71)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.2455	0.2817	0.235	0.1956	0.2557	0.1312
F-statistics	8.63***	10.62***	8.21***	6.53***	9.22***	4.05***
Number of observations	634	647	639	642	641	640

Notes: The dependent variable is corporate investment (INV$_t$) measured by capital expenditure deflated by total assets in year t. TOB$_{t-1}$ is Tobin's Q measured by market value of equity plus book value of debt deflated by total assets in year t–1. IND$_t$ is board independence measured by the fraction of independent directors on the board in year t. ROA$_t$ is firm profitability measured by return on assets in year t–1. LEV$_{t-1}$ is financial leverage measured by total liabilities deflated by total assets in year t–1. CAS$_{t-1}$ is cash holdings measured by cash and equivalents deflated by total assets in year t–1. SIZ$_{t-1}$ is firm size measured by natural logarithm of total assets in year t–1. SOE$_t$ is the state ownership dummy assigned 1 if at least 50 percent of shares are held by government agencies and 0 otherwise in year t. *, **, ***Significant at 10, 5 and 1 percent levels, respectively

Table V.
The effects of board
independence on
corporate investment
by financial constraint

show that the negative effect of board independence on firm investment is economically and statistically higher for financially constrained firms. This implies that independent directors work more effectively to reduce overinvestment when firms face high financial constraint. In addition, the positive relationship between the interactive term and corporate investment is statistically significant and larger in the regression results for firms with high financial constraint. This indicates that independent directors are more likely to help firms improve their investment efficiency when they are financially constrained.

6. Conclusions

The extant literature shows that independent directors are an effective mechanism to reduce the agency problem in firm decisions and operating performance. However, there has been no research on the role of independent directors in corporate investment policy. In this paper, we argue that board independence can help firms reduce managers' overinvestment and increase investment efficiency in Vietnam, an emerging market that experiences low enforceability of legislation on corporate governance. Using a research sample of 1,281 observations from 193 firms listed in the Ho Chi Minh City Stock Exchange, we find that the fraction of independent directors in the board is negatively related to corporate investment and positively associated to investment efficiency. Besides, these effects are stronger with financially constrained firms. These results provide both government agencies and public firms policy implications to increase board independence with the aim of improving corporate governance quality in Vietnamese stock markets.

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