Unsystematic risk and corporate performance in family ownership studies: A mediation effect or a weak instrument?

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Abstract

In recent years, the emergent interests in corporate governance have been focused on the impact of family ownership – a special type of ownership concentration - on firm performance. In this baseline of research, the prominent problem are the selection bias and the endogeneity. Therefore, this study is conducted to examine these problems in the relationship between family ownership on firm performance by using a new econometric technique – generalized structural equation model (GSEM) – in comparison with the original method – Instrumental Variable. On the sample of 289 Vietnamese listed firms in Ho Chi Minh stock exchange in the year of 2013, we found that family ownership or participations of relative members on the board of directors and the executive position could hurt company activities which then results in a lower firm's performance and a higher risk of bankruptcy. In addition, findings from this study consider the presence of using weak instrumental variable (unsystematic risk).

Key words: *Unsystematic risk, Family Ownership, Firm's Performance, Multivariate regression model, General structural equation model, HOSE.*

1. Introduction

The corporate governance framework specifies the essential structure of controlling and directing the companies. This framework involves the activities of board of directors, controlling shareholders, the relationship among the management and so on. A good corporate governance can stabilize the financial situation, and foster firm's performance (International Finance Corporation 2013). Within this framework, a growing body of researches has focused on family's ownership. Family firms have been considered less efficient and less profitable than those without the family control. These family firms may have the conflict of financial benefits (Anderson & Reeb 2003). These firms may have become too costly to run if there is the duality of the founder, being the owner and the manager (Villalonga et al., 2006). On the other hand, King and Santor (2008) found that family firms have a similar market performance with other firms. Also, Isakov and Weisskopf (2014) presented that family firms can even be more profitable and these firms exhibit better market value than the non-family firms.

For the emerging countries in Asia, several papers have been attempted to verify this complex issue in recent years. Claessens et al. (2002) investigated public companies in the Asian economies and found that firm value has risen by increasing the large shareholder ownership, while Jaggi et al., (2009) showed the effective monitor of corporate governance to firm performance if there is a family control in a firm. In Vietnam, World Bank (2013) has presented the emergence of the family's business and the private concentrated shareholders in corporate governance framework. This is the formulation of the sharing responsibilities among the family members, or the activities of holding the important positions on the board of directors and management process of family business. Whereas, reports from the Asian Development Bank (ADB) (2013, and 2014) and the International Finance Corporation (2012) indicated that the quality of the Vietnam corporate governance process has been considered low which is classified as *the below average situation* (obtaining 28.4% and 33.9% point in 2012 and 2013). Consequently, it is necessary to considered carefully to check whether there is the relationship between family ownership and firm performance in Vietnam context or not.

In addition, another prominent issue in the analysis of family ownership, the sample would tend to be not randomly selected due to the family's decisions on what firm to manage or control. It means that the proxy of family may not represented for all the observations (Miller et. at., 2007;

Li & Prabhala 2008; and Jameson & Prevost 2014). Therefore, it could be the case of the sample selection bias. In the way of dealing with this bias, Khandker et. al., (2010), and Guo and Fraser (2014) has pointed the underscored process of using instrumental variable by applied the treatment effect model. However, this application should be carefully considered since there could be a case of weak instrumental variable. Noticing the interpretation of the regression coefficients in the selection equation, Li and Prabhala (2008); and Guo and Fraser (2014) has specified that this problem is prevalent when there is an insignificant coefficient of instrumental variables, although the likelihood ratios test (in treatment effect model) is significant. In addition, they has demonstrated the instrumental variable could not be actually exogenous, or even potentially affect on the main dependent variable.

In conclusion, this study is different with the extended literature by shedding light on the following fundamental areas. *First,* the family ownership is strictly considered in the new context of Vietnam. *Second,* the various aspects of family ownership (the family involvement, the relative founders, and the family CEO) and different measurements of firm performances (market measurement, accounting measurement, and risk of bankruptcy) are deliberated to analyze. *Third,* the empirical evidence of using the weak instrumental variable is clarified in the line of family ownership's research. *Fourth,* the empirical evidence of insignificant results of market measurement (Tobin's Q), in the Vietnam context. *Fifth,* it has been confirmed about the potential effect of unsystematic risk on firm performance since the family CEO is concerned as a mediate channel. *Sixth,* a number of the newly used econometric techniques, are adopted in this study including (i) the multivariate regression model (MVREG); (ii) the sensitive analysis of treatment effect model; and (iii) the generalized structural equation model (GSEM).

2. Literature review

2.1. Potential benefits of family ownership

Family ownership is a special case of ownership structure. The family usually invests most of their private assets in the company. Definitely, this wealth is not well diversified. Investors will concern mostly about their companies and constitute a long term strategies for the company that could create a strong incentive for them to strictly control management mechanism. (Demsetz & Lehn 1985, Andres 2008). Families usually care about their company since they have contributed the large part of their wealth in the company, they then constituted the company from the

beginning, or considered the company as their identity and patrimony (Arregle et al., 2007). Reputation, the perception of family in the society have directly linked the company fortune to the family owners that create a strong incentive to make the company operate in the long term strategy, not a pure self-controlled (Miller and Le Breton Miller 2005). As a result, the family ownership could explore less their benefit, focus on building up the company and controlling efficiently the managers (Ward 2004, Corbetta & Salvato 2004). In addition, it could help narrow down the owner-manager conflict when the family member hold the important position in company such as the executive board. Ideally, the descendant can oppose to the outsiders, create the trust in the employees, mature a long term relationship with suppliers and external shareholders, if they could grow up closely with the firm, or stretch the knowledge and experience within their families (Andres 2008).

Ward (1988) concerned the spirit of moving forward of reinvestment. It is considered as a commitment that can target for the future benefit of the company. It means that the emotional investment design a strategic planning so as to create the motivation that foster the family business based on the individual characteristic and unique perspective. Preparing a good strategy planning, the family can release the energy that can strengthen for the family enterprise in the next generation. As a result, the long term family business creates a working network or a working environment which sustain the trust, the loyalty embedded with employees. It will lead to a lower level of turnover and recruitment cost. Then, this will construct a good reputation to customers or suppliers of funds. Anderson et al. (2003) exhibited that family firms have incurred a lower cost of debt in comparison with non-family firms. These findings are related to the long term survival that would be a promise for reducing the agency conflicts. Furthermore, the long term contract among shareholders is also necessary to promote investment plans. This is a basement for increasing firm's credibility to commit implicit contracts which is a desirable solution of gaining trust of the potential external shareholder in the future (Williamson 1979, Tagiuri and Davis 1996). Since most families consider their asset in the companies should be passed from generation to generation rather than consumed it at a time, their investment decisions do not forgo the long term interests due to the temporary earning in present. This would lead to the efficient mechanism of investment that has contributed to an increase of firms' value (Stein 1988, Casson 1999, Chami 2001).

The last but not least, applying the resources-based view of the firm to the study of family firms, Eddleston et al., (2008) figure out the view moderation of the opportunities for the technology and the strategic planning for the family business. He concerned the two aspects of competitive advantage of the family business: the reciprocal altruism and the innovative capacity. These aspect can help to contribute to the family performance. It create a high environment that examine the family relationship. Then, it create a positive manner of kinship which benefits for the firm performance.

2.2. Potential costs of family ownership

Nevertheless, there are a number of situation that family ownership make the firm value decreasing. Theoretical research has confirmed that the professional managers or outside director will do productively than the descendants or family members. It could be the case that the founder make their benefit sticking with the fortune of the company while their family members just withdraw the interest from the company, use for other purpose, not constitute it (Morck et al., 1988). There is a worse case as the heirs are put into the executive position instead of outside or professor directors. In addition, the firm valuation and profitability would be decreased instantly, because of the fragile knowledge of the family members (Pérez-González 2006). The fact that is the family members tend to take over the executive position, then the labor pool is restricted to a very small group. Nonetheless, their entrepreneurial ability and expert characteristic are partly transferred from the initial founders, and their talent is just at average stage that leads to the negative firm performance (Morck et al., 2000).

Furthermore, the assumption of outperforming performance of family ownership is not actually true. The results depends on the characteristic of board structure, types of companies, or the country's culture. The main driver of positive effects is just at the initial or founder stage (Isakov & Weisskopf 2014). The family ownership has created the impediment toward the third party in choosing the directors or managers. It would make the process of recruiting the skilled or talent human resources be damaged that make the lower firm values in comparing with nonfamily firms (Gomez Mejia et al., 2001). Even, the family would also explore the firm's wealth by paying exceeding compensation, or receiving special dividends (Anderson & Reeb 2003). Schack (2001) has showed that the increasing voting right of family members without any compensation has led to widespread controversial at the Ford Motor company. This received the criticism that the board

has brought the benefits for the family at the expense of others. Whereas, DeAngelo and DeAngelo (2000) exhibited the family's desire of special dividend can affect the firm's capital plans, leading to a poor performance.

Demsetz and Lehn (1985) also argued the families get the non-pecuniary benefit by move the firm's strategy in the ways that supports for their own interest, not for maximizing profits. In addition, Andres (2008) discussed that the family usually prefer the less risky (in the sense of the probability of default) one. Because they normally use the less debt in financing capital structure. It means that the will miss the opportunity of the potential external funds for investment and the advantage of higher tax shield ratios. Tsoutsoura (2014) investigated the impact of the succession tax on the investment decisions of family firms and figured out that the family ownership with a succession tax strategy would bear a slow sale growth, a reduction of cash reserve or depletion of investment.

3. Data description

3.1. Sample sections

Data are collected at the firm level from Ho Chi Minh City Stock exchange (HOSE). However, there is the fragment of this publicly available data set. It is necessary to use several other sources which are publicly available such as firms' prospectus or annual reports, and the firms' information on the websites - cafef.vn and vietstock.vn. The initial number of firms in HOSE is 341, then we narrow down to 289 firms. The removed firms include 28 financial firms which have a different capital structure in comparison with the others from the sample; 23 firms violated the security regulations, consecutive loss, merged by other company or delisting; and 1 company (SFG) does not have enough information for this analysis.

3.2. Descriptive statistic

From Table 1, families contribute 43.3 percent in the board from the firms' sample. This ratio is quite similar with the Japanese companies (Abdellatif et al., 2010, 42.68%), and the European companies (Faccio 2002, 44.3%; Barontini 2006, 52.3%). It is small in comparing with Hongkong companies (Jaggi 2009, 52.4%), and the general level of eight East countries (Claessens 2006, 60%). Nevertheless, it is quite large in comparing with the US companies (Anderson and Reeb 2003, 35%; Villalonga & Admit 2006, 37%; King and Santor 2008, 32%; Miller 2011, 29%). As a result, this could be a good signal of the structure of sample for analyzing the family effect

in this paper. Besides that, the family CEO and the founding family present 40.1% and 31.1% of the sample. These number are also quite high in the context of Vietnam's corporate governance.

Table 1. Descriptive statistic. The sample is collected from the 289 listed companies in the Ho Chi Minh stock exchange in the year of 2013.

Variable	Obs	Mean	Std. Dev.	Min	Max
Family's facets					
Family	289	0.432	0.496	0	1
Founding family	289	0.311	0.464	0	1
Family CEO	289	0.401	0.491	0	1
The corporate governance feature					
Board size	289	5.872	1.365	3	11
Duality	289	0.343	0.475	0	1
Diversity	289	0.152	0.171	0	0.800
Outside directors	289	0.149	0.185	0	0.833
Directors over 60s	289	0.105	0.138	0	0.600
Foreign ownership	286	0.109	0.143	0	0.725
The financial factors					
Total asset	289	2563.813	6778.834	75.661	75772.600
Capital expenditure	289	0.048	0.089	0	0.877
Debt	289	0.133	0.168	0	0.921
Growth in sale	289	0.221	1.259	-0.952	11.459
Firm performance					
Tobin's Q	278	1.083	0.909	0.015	12.658
ROA	287	5.245	9.090	-19.980	74.260
Z-score	287	6.879	9.191	-18.345	75.428
The strategic risk					
Unsystematic risk	276	0.128	0.152	0.030	2.080
Systematic risk	276	0.647	0.631	-1.087	7.011

Source: Author's analysis

Most of corporate governance factors is quite small in comparing with the other countries. Particularly, the mean of board size is 5.8 which is similar with the result of Vietnam's corporate governance studies (Vo & Phan 2013; and Vo & Nguyen 2014), but is small in comparing with the studies in other countries (8.02 – Jameson et. Al., 2014; 8.3 – Jaggi 2009). In addition, the present of diversity and outside director (15.2 percent and 14.9 percent) is quite small which is similar with the report of International finance corporate corporation (2012). Whereas, CEO duality (34.3 percent); and directors over 60 years old (10.5 percent); and the voting power of foreign ownership have just recorded at 10.98 percent.

The long term debt ratio is 13.25 percent, while the sale growth is small (0.221 percent). For the firm size, the total asset is 2563.81 billion VND. The mean of Tobin's Q ratio (the market measurement of firm performance) is 1.08; the ROA ratios (the accounting measurement of firm performance) is 5.2; and the Z-score ratio (the risk of bankruptcy measurement) is 6.88. The last

but not least is the strategic risk. In average, it is quite large, and near to the market unit - 0.65 unit of the systematic risk -, while the unsystematic risk is quite small at the 0.128 unit.

4. Family ownership and performance

In order to clarify the impact of family ownership on various aspects of firm performance, this research begins with the examinations of the multivariate analysis technique. Actually, the current estimations have just concerning in the uni-variate analysis which used the separated regression equation. Nevertheless, in order to have a general view, and a more precise conclusions, it is necessary to proceed an analysis of multiple equation with estimating simultaneously the expected value of response variable. This will examine the simultaneous model as the linear function which take into account a set of various dependent variables and an identical independent variables (Khattree & Naik 2000, and Johnson & Wichern, 2008). This is called the multivariate regression model (MVREG). The following models is considered in this empirical study:

$$\textit{(Tobin's Q/ROA//Z-score)} = \beta_0 + \beta_1 \textit{(family involvement/founding family/family CEO)} + \beta_2 \textit{(control variable)} + \beta_3 \textit{(two digit VSIC code)} + \varepsilon$$

The set of equations will figure out the impact of various aspect of family ownership (proxied by family involvement, founding family, and family CEO) on various firm performance (proxied by the market measurement – Tobin's Q; the accounting measurement – ROA; the risk of bankruptcy – Z-score). The detail of variable definitions are presented in the appendix.

From Table 2, the results of the multivariate regression model present the negative impact (significant at 1 per cent) of the various aspect of family ownership (family involvement, founding family, and family CEO) on firm's performance when the accounting measurement (ROA) and risk of bankruptcy (Z-score) are used as a proxy for firm's performance. However, when firm's performance is proxied by the measurement of market factor (Tobin's Q), the result is not statistically significant. In the next sections, this will be examined in details so as to answer whether this is the proper result or not.

Next, most of the proxies for board characteristics are insignificant. This exhibits a signal for the weak application of the management standard in Vietnam circumstance that the previous report have been considered (Cung 2008; Minh, 2008; International Finance Corporation 2012, and World Bank 2013). Particularly, the insignificance of board size can come from the situation of "partial observed" state of corporate governance practice (International finance corporate 2012),

and the problem of "separate power" in the board structure (Quang et al. 1998). The insignificant coefficients of the duality, the diversity and the outside directors are occurred due to the following reasons: (i) the active roles of these directors can be eliminated by the strong concentration ownerships (Anderson & Reeb 2004; and Jameson et al., 2014); (ii) it is a problem of distinguishing functions between the chairman and the executive positions (International finance corporate 2012); and (iii) there is a fuzzy determination of the outside directors (between the role of "independent" and "non-executive" director).

Nevertheless, the results also presents some good signals of redeeming the firm's performance, since there is an increase in foreign ownership and the positive contribution of director over 60 years old. These results has confirmed that the responsibility, the experiment of the board's operation can benefit for the company; and the positive role of foreign ownership in improving the firm performance. (The International Finance Corporation 2012, and World Bank 2013). This is a tendency that emerge as the effective solution for the most successful companies in Vietname, such as Vinamilk, Vinh Hoan corp, FPT.

In relation to financial characteristics, capital expenditure represents a positive effect on firm's performance (significant at 1 percent). With the model of accounting measurement (ROA) and risk of bankruptcy (Z-score), the firm performance will increase approximately 20 units when capital expenditure increases by 1 unit. However, it has also demonstrated that the increase of debt could lead to a lower firm performance (significant at 1 percent). For this result suggests that the corporate managers should consider carefully by using debt structure.

Table 2. The multivariate regression model. Applying the multivariate regression model, this table analyzes the impact of three aspect of family ownership (family's involvement, founding family, and family CEO) on firm performance (proxied by: market measurement – Tobin's Q; accounting measurement – ROA; and risk of bankruptcy – Z-score). There is a simultaneous effects of each of proxies of family ownership on three aspects of firm performance. The Breusch-Pagan test of independence demonstrates the significant correlation between each three of equations. ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

Variables	**MVREG Tobin's Q**	**MVREG ROA**	**MVREG Z-score**	**MVREG Tobin's Q**	**MVREG ROA**	**MVREG Z-score**	**MVREG Tobin's Q**	**MVREG ROA**	**MVREG Z-score**
Cons	0.858	7.044	8.400*	0.911*	5.468	6.858	0.899*	6.378	7.745*
	(0.110)	(0.116)	(0.061)	(0.092)	(0.226)	(0.129)	(0.094)	(0.159)	(0.087)
Family's involvement	**0.028**	**-3.125*** **	**-3.046*** **						
	(0.798)	**(0.001)**	**(0.001)**						
Founding family				**0.091**	**-3.272*** **	**-3.200*** **			
				(0.442)	**(0.001)**	**(0.001)**			
Family CEO							**0.103**	**-2.658*** **	**-2.606*** **
							(0.365)	**(0.006)**	**(0.007)**
Board size (log)	0.416	0.558	0.557	0.390	1.140	1.128	0.404	0.478	0.482
	(0.129)	(0.807)	(0.807)	(0.158)	(0.622)	(0.625)	(0.141)	(0.836)	(0.834)
Duality	0.008	0.439	0.438	-0.003	0.298	0.302	-0.017	0.453	0.456
	(0.943)	(0.646)	(0.647)	(0.978)	(0.753)	(0.749)	(0.886)	(0.643)	(0.640)
Diversity	-0.222	-1.416	-1.388	-0.246	-1.081	-1.058	-0.235	-1.693	-1.655
	(0.490)	(0.598)	(0.604)	(0.446)	(0.688)	(0.694)	(0.464)	(0.530)	(0.539)
Outside director	-0.415	-2.419	-2.451	-0.407	-2.521	-2.552	-0.419	-2.094	-2.134
	(0.141)	(0.304)	(0.297)	(0.149)	(0.284)	(0.278)	(0.137)	(0.376)	(0.366)
Director over 60s	0.560	6.033*	6.029*	0.556	5.220	5.239	0.546	5.307*	5.325*
	(0.149)	(0.063)	(0.063)	(0.148)	(0.105)	(0.103)	(0.156)	(0.100)	(0.100)
Foreign ownership	2.054***	12.608***	15.816***	2.064***	13.361***	16.546***	2.107***	12.524***	15.724***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total asset (log)	-0.073	-0.118	-0.128	-0.075	-0.075	-0.087	-0.078	-0.045	-0.057
	(0.135)	(0.771)	(0.752)	(0.123)	(0.853)	(0.831)	(0.113)	(0.913)	(0.890)
Capital expenditure	1.499**	20.540***	20.512***	1.502**	20.631***	20.599***	1.479**	21.292***	21.248***
	(0.018)	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)
Debt	-0.263	-13.162***	-13.140***	-0.271	-12.506***	-12.501***	-0.252	-13.024***	-13.008***
	(0.442)	(0.000)	(0.000)	(0.427)	(0.000)	(0.000)	(0.460)	(0.000)	(0.000)
Growth in sale	-0.011	-0.244	-0.243	-0.009	-0.345	-0.342	-0.012	-0.257	-0.257
	(0.792)	(0.493)	(0.494)	(0.827)	(0.333)	(0.337)	(0.775)	(0.473)	(0.475)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.168	0.221	0.247	0.1698	0.2195	0.246	0.171	0.209	0.237
Breusch-Pagan test (Pro>chi2)		(0.000)***			(0.000)***			(0.000)***	

5. Controlling for the problem of selection bias

5.1. Problem of selection bias

The prominent issue in the analysis of family ownership is that the sample would tend to be not randomly selected due to the family's decisions on what firm to manage or control. It means that the proxies of family ownership may not represented for all the observations (Miller et at., 2007; Li & Prabhala 2008; and Jameson et. al., 2014). Therefore, it could be the case of the sample selection bias. In the way of dealing with this bias, Khandker et., al. (2010), and Guo and Fraser (2014) has pointed the underscored process of using instrumental variable by applied the "Treatment effect model" as following:

A sample selection model will include two main parts: (1) a regression equation obtains the process of calculating the outcome; (2) a selection equation with outcome is observed from a portion of the sample.

$$y_i = \beta x_i + \delta w + \varepsilon_i \quad (1)$$

$$w^* = \gamma z_i + u_i,\ w_i = 1 \text{ if } w^*>0, \text{ and } w_i = 0 \text{ otherwise} \quad (2)$$

$$\text{Prob}\ (w_i = 1|z_i) = \Phi\ (z_i\gamma)$$

$$\text{Prob}(w_i = 0|z_i) = 1 - \Phi\ (z_i\gamma)$$

Equations (1) and (2) are the switching regressions. When equation (2) is substituted for equation (1), the regression is as follows:

$$y_i = \beta x_i + \delta(\gamma z_i + u_i) + \varepsilon_i \quad (\text{when } w^*>0,\ w_i = 1)$$

$$yi = \beta x_i + \varepsilon_i \quad (\text{when } w^*\leq 0,\ w_i = 0)$$

For now, one notable issue should be concerned that is the identity of the z_i factor. From the point of view of observing the participant i in the treatment condition of both family and non-family ownership, Villalonga and Amit (2006); Masulis (2011); Isakov and Weisskopf (2014); Jameson et. al., (2014) consider the set of exogenous variable that includes at least a strict exogenous variable that is uncorrelated with the residual ε, but can predict the event w_i. In this case, the unsystematic risk (or the specific risk) is consider as this special exogenous variable or an instrumental variable. Actually, Gomez et al. (2003); Florackis et al. (2009) discussed that the specific risk may not affect the firm performance since it's affected by the activities "diversification" and "hedge" of the managers. Whereas, this risk can affect the probability of family ownership due to the endowment mechanism, the entrenchment of family's power, and the balance for the threat and risks in family's companies. Applying this ideas, Villalonga and Admit

(2006); Miller et al. (2007); Masulis et al. (2011) Isakov and Weisskopf (2014) consider the following model (CAPM) so as to calculate the specific risk:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}$$

The unsystematic risk is represented respectively by the residual ε. It is captured by obtaining the standard deviation of the residual from the regression in which firm's weekly stocks returns are regressed on the weekly VN-Index return in the period of 2011-2013.

From table 3, 4, 5, family effect toward firm's performance is considered in 3 different measurements, including (i) market measurement (Tobin's Q); (ii) accounting measurement (ROA); and (iii) risk of bankruptcy (Z-score). Each of these measurements will be analyzed after dealing with the selection bias by using the unsystematic risk as the instrumental variable. In addition, this section will clarify this problem in various aspects of family ownership, such as: family's involvement, founding family, and family CEO.

As a result, findings from the analysis presents that the significance of the likelihood ratio test (at 1 per cent) confirms the existence of the self-selection bias problem when the firm performance are analyzed by the market measurement – Tobin's Q. whereas, it is insignificant when the corporate performance are calculated by the accounting measurement (ROA), and the risk of bankruptcy (Z-score). It means that when the null hypothesis is rejected, there is a present a selection bias problem. And then the result of "treatment effect" is chosen in case of market measurement (Tobin's Q).

Table 3. The adjusting selection bias in the family's involvement. By using the treatment effect model, this table has portrayed the family effect toward firm performance after being adjusted for the selection bias in the family's involvement. There are the two crucial steps in the self-selection bias analysis: (i) the "selection" model which is defined the Probit model that obtain the estimation of the instrumental variable – unsystematic risk; (ii) the "outcome" model which specifies original model, obtains the adjusted estimation of family's involvement. The likelihood ratios test (LR test) determines the significant level of using treatment effect model, and the presence of the self-selection bias problem. ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

Variables	**Outcome 1 (Tobin's Q)**	**Selection 1 (Family's involvement)**	**Outcome 2 (ROA)**	**Selection 2 (Family's involvement)**	**Outcome 3 (Z-score)**	**Selection 3 (Family's involvement)**
Cons.	1.259***	-0.279*	3.247	-0.469***	5.035	-0.460***
	(0.009)	(0.074)	(0.473)	(0.004)	(0.266)	(0.005)
Family's involvement	-1.371***		6.512**		6.628***	
	(0.000)		(0.011)		(0.009)	
Board size (log)	0.176		0.545		0.414	
	(0.471)		(0.805)		(0.851)	
Duality	0.384***	0.399**	-2.147*	0.594***	-2.149*	0.588***
	(0.007)	(0.012)	(0.083)	(0.001)	(0.082)	(0.001)
Diversity	0.187	0.321	-4.462	0.804*	-4.476	0.816*
	(0.639)	(0.489)	(0.154)	(0.088)	(0.154)	(0.083)
Outside director	-0.568	-0.455	-1.062	-0.327	-1.244	-0.327
	(0.105)	(0.270)	(0.694)	(0.436)	(0.646)	(0.436)
Director over 60s	1.229**	0.808	1.875	1.010*	1.773	1.005
	(0.011)	(0.137	(0.628)	(0.099)	(0.647)	(0.102)
Foreign ownership	1.567***	-0.632	15.358***	-1.156**	18.754***	-1.179**
	(0.001)	(0.229)	(0.000)	(0.036)	(0.000)	(0.033)
Total asset (log)	-0.018		0.024		-0.006	
	(0.672)		(0.952)		(0.988)	
Capital expenditure	1.692***		21.109***		21.076***	
	(0.009)		(0.000)		(0.000)	
Debt	-0.475		-13.276***		-13.291***	
	(0.135)		(0.000)		(0.000)	
Growth in sale	-1.823		-32.114		-32.089	
	(0.628)		(0.330)		(0.330)	
Unsystematic risk		0.024		0.112		0.101
		(0.947)		(0.783)		(0.804)
industry	Yes		Yes		Yes	
LR test (rho = 0), Chi-square	39.14		1.61		1.68	
Prob>chi2	(0.000)***		(0.205)		(0.194)	

Sources: Author's analysis

Table 4. The adjusting selection bias in the founding family. By using the treatment effect model, this table has portrayed the family effect toward firm performance after being adjusted for the selection bias in the founding family. There are the two crucial steps in the self-selection bias analysis: (i) the "selection" model which is defined the Probit model that obtain the estimation of the instrumental variable – unsystematic risk; (ii) the "outcome" model which specifies original model, obtains the adjusted estimation of founding family. The likelihood ratios test (LR test) determines the significant level of using treatment effect model, and the presence of the self-selection bias problem. ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

Variables	**Outcome 4 (Tobin's Q)**	**Selection 4 (Founding family)**	**Outcome 5 (ROA)**	**Selection 5 (Founding family)**	**Outcome 6 (Z-score)**	**Selection 6 (Founding family)**
Cons.	1.066**	-0.589***	7.075	-0.998***	8.959**	-0.990***
	(0.032)	(0.000)	(0.109)	(0.000)	(0.042)	(0.000)
Founding family	-1.281***		-8.003***		-7.963***	
	(0.000)		(0.009)		(0.009)	
Board size (log)	0.215		0.483		0.332	
	(0.393)		(0.829)		(0.881)	
Duality	0.291**	0.351**	1.118	0.580***	1.107	0.575***
	(0.035)	(0.031)	(0.323)	(0.001)	(0.327)	(0.001)
Diversity	0.255	0.477	0.507	1.086**	0.569	1.093**
	(0.513)	(0.318)	(0.863)	(0.029)	(0.847)	(0.028)
Outside director	-0.594*	-0.568	-3.104	-0.574	-3.301	-0.579
	(0.081)	(0.188)	(0.203)	(0.217)	(0.177)	(0.213)
Director over 60s	0.890*	0.451	6.968**	0.737	6.926**	0.732
	(0.056)	(0.421)	(0.038)	(0.214)	(0.039)	(0.217)
Foreign ownership	2.019***	0.023	13.285***	0.014	16.524***	-0.005
	(0.000)	(0.966)	(0.000)	(0.980)	(0.000)	(0.994)
Total asset (log)	-0.024		-0.018		-0.049	
	(0.570)		(0.963)		(0.900)	
Capital expenditure	1.864***		20.175***		20.150***	
	(0.004)		(0.000)		(0.000)	
Debt	-0.425		-12.639***		-12.675***	
	(0.185)		(0.000)		(0.000)	
Growth in sale	-2.471		-38.719		-38.448	
	(0.532)		(0.264)		(0.267)	
Unsystematic risk		0.135		0.602		0.595
		(0.717)		(0.199)		(0.205)
Industry	Yes		Yes		Yes	
LR test (rho = 0), Chi-square	25.87		1.29		1.31	
Prob > chi2	(0.000)***		(0.256)		(0.252)	

Sources: Author's analysis

Table 5. The adjusting selection bias in the family CEO. By using the treatment effect model, this table has portrayed the family effect toward firm performance after being adjusted for the selection bias in the family CEO. There are the two crucial steps in the self-selection bias analysis: (i) the "selection" model which is defined the Probit model that obtain the estimation of the instrumental variable – unsystematic risk; (ii) the "outcome" model which specifies original model, obtains the adjusted estimation of family CEO. The likelihood ratios test (LR test) determines the significant level of using treatment effect model, and the presence of the self-selection bias problem. ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

Variables	**Outcome 7 (Tobin's Q)**	**Selection 7 (Family CEO)**	**Outcome 8 (ROA)**	**Selection 8 (Family CEO)**	**Outcome 9 (Z-score)**	**Selection 9 (Family CEO)**
Cons.	1.272***	-0.418***	7.017	-0.707***	8.625*	-0.731***
	(0.008)	(0.007)	(0.118)	(0.000)	(0.054)	(0.000)
Family CEO	-1.333***		-3.192		-3.166	
	(0.000)		(0.363)		(0.367)	
Board size (log)	0.249		0.087		0.024	
	(0.302)		(0.969)		(0.991)	
Duality	0.436***	0.544***	0.498	0.816***	0.498	0.810***
	(0.002)	(0.001)	(0.723)	(0.000)	(0.723)	(0.000)
Diversity	0.041	0.143	-1.858	0.53	-1.798	0.544
	(0.918)	(0.758)	(0.490)	(0.283)	(0.505)	(0.270)
Outside director	-0.425	-0.258	-1.999	-0.235	-2.075	-0.12
	(0.222)	(0.539)	(0.382)	(0.600)	(0.363)	(0.789)
Director over 60s	0.889*	0.744	5.842*	0.696	5.863*	0.761
	(0.063)	(0.179)	(0.070)	(0.234)	(0.072)	(0.194)
Foreign ownership	1.518***	-0.388	12.197***	-1.110*	15.419***	-1.121*
	(0.002)	(0.467)	(0.001)	(0.053)	(0.000)	(0.051)
Total asset (log)	-0.04		0.001		-0.022	
	(0.337)		(0.999)		(0.957)	
Capital expenditure	1.926***			20.961***		20.914***
	(0.000)		(0.000)		(0.000)	
Debt	-0.421			-13.092***		-13.087***
	(0.179)		(0.000)		(0.000)	
Growth in sale	-2.753		-31.495		-31.36	
	(0.423)		(0.361)		(0.363)	
Unsystematic risk		0.14		1.265*		1.300*
		(0.699)		(0.082)		(0.083)
Industry	Yes		Yes		Yes	
LR test (rho = 0), Chi-square	47.080		0.060		0.06	
Prob > chi2	(0.000)***		(0.812)		(0.803)	

Sources: Author's analysis

Nevertheless, it has also been figured out that the insignificant coefficient of instrumental variable – unsystematic risk – in most of models, although the likelihood ratios test is significant in the model of market measurement (Tobin's Q). In this view of this problem, Li and Prabhala (2008); and Guo and Fraser (2014) has specified the importance of interpretation the regression coefficients in the selection equation, and the significant coefficients of the instrumental variable is always meaningful for this method. Unless there is a significant level of instrumental variable, it could be a case of the prevalent of the potential effects from this variable on the main dependent variable. As a result, this instrumental variable could not be actually exogenous, or be a weak instrumental variable.

5.2. Problem of weak instrumental variable

The previous section has clarified the problem of using the weak instrumental variable. Actually, it is a premise for a necessity of applying a more relevant model in order to deal with the problem of selection bias (or even endogeneity), but not using a weak instrumental variable.

For that reason, this section deliberates the mechanism of using the switching mechanism of General Structural Equation Model (GSEM) that is demonstrated by Li and Prabhala (2008). Actually, they has figured out the issue of identifying the true instrumental variable, and then considered this following characteristics of GSEM technique:

$$y_1 = \gamma_{11} x_1 + \zeta_1 \quad (3)$$

$$y_2 = \beta_{21} y_1 + \gamma_{22} x_1 + \zeta_2 \quad (4)$$

The two equations exhibits the recursive mechanism that the x_1 exogenous variables impact on the y_1 and y_2 responded variables. It should be noticed about the role of the y_1 variable in the model as following: (i) it is the endogenous variable (defined within model); (ii) it has kept the role of the outcome variable in the former model, but contributed as the independent variable in the latter model. The mediation models obtain the transmitted mechanism in both direct and indirect effect of x_2 variable that can deal with the problem of selection bias.

In general term, this study has concerned the results of generalized structural equation model instead of treatment effect model. And that provide an empirical solution for dealing with the selection bias (or endogeneity) when there is a weak instrumental variables in corporate finance context. The following models are specified in the GSEM method:

Family's effect (family/founding family/family CEO) = $\beta_0 + \beta_1$ (idiosyncratic risk)
$+ \beta_2$ (duality) + β_3 (diversity) + β_4 (outside director) + β_5 (director over 60)
$+ \beta_6$ (foreign ownership) + ε (5)

Firm performance (Tobin's Q/ROA/Z-score) = $\beta_0 + \beta_1$ (family/family and founder)
$+ \beta_2$ (idiosyncratic risk) + β_4 (control variable)
$+ \beta_5$ (two digit SIC code) + ε (6)

From these equations, an interest question is how unsystematic risk considered as an instrumental variable in the previous section is now presented in the main equation that affects on corporate performance. Actually, although there is a number of empirical research has concerned that the unsystematic risk may not impact on the firm performance due to the companies has proceeded the activities "diversification" and "hedge" of the managers (Miller et al., 2005; Gomez et al., 2003; Florackis et al., 2009, Masulis 2011; Isakov & Weisskopf, 2014), it exists also a number of empirical study clarify the opposite way. In the fact that, Nickel and Manuel (2005), Bettis and Hall (1982), and Change and Thomas (1989) demonstrated the relationship between unsystematic risk and return can be arose due to the differences of the strategic position from the companies. It means that a good manager can achieve not only higher return, but also lower risk. And then, the concentrated diversification strategy can explore the variation of corporate performance. As a results, it could be a case of the potential effects on firm performance from unsystematic risk.

From the table 6, 7, 8, it presents the significant impact of family's ownership (proxied by family involvement, founding family, and family CEO) on firm performance when the accounting measurement (ROA) and risk of bankruptcy (Z-score) are used as a proxy for firm's performance. Again, when firm's performance is proxied as the measurement of market factor (Tobin's Q), the result is not statistically significant.

In general, after obtaining the two econometric technique – MVREG and GSEM –, demonstrating the problem of weak instrumental variable, this research can deliberate to accept a robust results that there is no actual effects from the family's ownership when the firm performance is analyzed by the market approach in the Vietnam current context. The reasonable explanations for this result could be considered as following: (i) there is a weak application of corporate governance that leads to a bias analysis of market approach (proxied by Tobin's Q) (Claessens & Djankov 1999; and Phung & Hoang 2013); (ii) the market approach is not actually represented for

the firm performance in the emerging market (Joh 2003; and Vo and Nguyen 2014); and (iii) there is the more efficient application of the accounting measurement, or others (Hang 2015).

That last but not least, by figuring out the problem of weak instrumental variable, this study has also confirmed the potential negative effect of unsystematic risk on firm performance since the family CEO is concerned as a mediate channel. This can be explained by the analysis of the family's attitude when the facing with the specific risk. In the fact that, James, (1999); Casson (1999); Gomez Mejia et al., (2001); and Gomez-Mejia et al., (2003) has described that family's business would tend to preclude from accessing the outside fund, limit the diversified portfolio, obtain higher cost of specific risk, and thereby exacerbate the business failure. It means that the more family business presented, the higher specific risk could be suffered, and that could lead to the low performance.

Table 6. The unsystematic risk, family's involvement, and firm performance. This tables figures out: (i) the causal impact of the family's involvement, together with corporate governance factors on the firm performance; (ii) the direct effect of the unsystematic risk and firm performance; and (iii) the mediation effects of the unsystematic risk toward the firm performance which is specified by the direct impact of specific risk on family's involvement, and then the direct effect of family's involvement on the firm performance. The results are analyzed by using the generalized structural equation model (GSEM). ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

	Tobin's Q	**Family's Involvement**	**ROA**	**Family's Involvement**	**Z-Score**	**Family's Involvement**
Cons.	0.867*	-0.559***	8.751**	-0.559***	10.733**	-0.559***
	(0.098)	(0.001)	(0.039)	(0.001)	(0.011)	(0.001)
Family's involvement	0.043		-2.558***		-2.479***	
	(0.699)		(0.004)		(0.005)	
Board size (log)	0.415		-0.669		-0.860	
	(0.125)		(0.760)		(0.693)	
Duality	0.016	0.656***	-0.205	0.656***	-0.229	0.656***
	(0.889)	(0.000)	(0.823)	(0.000)	(0.804)	(0.000)
Diversity	-0.232	0.808*	-1.195	0.808*	-1.087	0.808*
	(0.464)	(0.093)	(0.639)	(0.093)	(0.670)	(0.093)
Outside director	-0.416	-0.380	-1.622	-0.380	-1.767	-0.380
	(0.134)	(0.380)	(0.471)	(0.380)	(0.433)	(0.380)
Director over 60s	0.542	1.325**	5.887*	1.325**	5.889*	1.325**
	(0.155)	(0.021)	(0.055)	(0.021)	(0.055)	(0.021)
Foreign ownership	2.090***	-0.886	11.946***	-0.886	15.261***	-0.886
	(0.000)	(0.109)	(0.000)	(0.109)	(0.000)	(0.109)
Total asset (log)	-0.074		0.108		0.067	
	(0.123)		(0.781)		(0.863)	
Capital expenditure	1.536**		20.680***		20.680***	
	(0.013)		(0.000)		(0.000)	
Debt	-0.289		-12.589***		-12.557***	
	(0.402)		(0.000)		(0.000)	
Growth in sale	-0.011		-0.266		-0.264	
	(0.789)		(0.431)		(0.434)	
Unsystematic risk	0.002	0.309	4.366	0.309	4.273	0.309
	(0.997)	(0.543)	(0.198)	(0.543)	(0.209)	(0.543)
Industry	Yes		Yes		Yes	

Sources: Author's analysis

Table 7. The unsystematic risk, founding family, and firm performance. This Table figures out: (i) the causal impact of the founding family, together with corporate governance factors on the firm performance; (ii) the direct effects of the unsystematic risk and firm performance; and (iii) the mediation effects of the unsystematic risk toward the firm performance which is specified by the direct impact of specific risk on founding family, and then the direct effect of founding family on the firm performance. The results are analyzed by using the generalized structural equation model (GSEM). ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

	Tobin's Q	**Founding family**	**ROA**	**Founding family**	**Z-Score**	**Founding family**
Cons.	0.934*	-0.965***	7.537*	-0.965***	9.511**	-0.965***
	(0.078)	(0.000)	(0.080)	(0.000)	(0.027)	(0.000)
Founding family	0.108		-2.588***		-2.502***	
	(0.359)		(0.007)		(0.009)	
Board size (log)	0.386		-0.233		-0.428	
	(0.157)		(0.916)		(0.846)	
Duality	0.004	0.559***	-0.346	0.559***	-0.362	0.559***
	(0.972)	(0.001)	(0.704)	(0.001)	(0.692)	(0.001)
Diversity	-0.260	1.043**	-0.941	1.043**	-0.848	1.043**
	(0.413)	(0.032)	(0.714)	(0.032)	(0.741)	(0.032)
Outside director	-0.404	-0.568	-1.705	-0.568	-1.845	-0.568
	(0.146)	(0.220)	(0.449)	(0.220)	(0.414)	(0.220)
Director over 60s	0.539	0.760	5.193*	0.760	5.216*	0.760
	(0.153)	(0.204)	(0.088)	(0.204)	(0.088)	(0.204)
Foreign ownership	2.096***	0.030	12.574***	0.030	15.871***	0.030
	(0.000)	(0.956)	(0.000)	(0.956)	(0.000)	(0.956)
Total asset (log)	-0.077		0.139		0.100	
	(0.111)		(0.721)		(0.799)	
Capital expenditure	1.536**		20.770***		20.773***	
	(0.013)		(0.000)		(0.000)	
Debt	-0.301		-12.046***		-12.034***	
	(0.381)		(0.000)		(0.000)	
Growth in sale	-0.009		-0.346		-0.342	
	(0.833)		(0.305)		(0.312)	
Unsystematic risk	-0.009	0.539	4.645	0.539	4.545	0.539
	(0.982)	(0.290)	(0.172)	(0.290)	(0.182)	(0.290)
Industry	Yes		Yes		Yes	

Sources: Author's analysis

Table 8. The unsystematic risk, family CEO, and firm performance. This Table figures out: (i) the causal impact of the family CEO, together with corporate governance factors on the firm performance; (ii) the direct effect of the unsystematic risk and firm performance; and (iii) the mediation effects of the unsystematic risk toward the firm performance which is specified by the direct impact of specific risk on family CEO, and then the direct effect of family CEO on the firm performance. The results are analyzed by using the generalized structural equation model (GSEM). ***, **, and * mark for the 1-, 5-, and 10-level of significant. P-value is in the bracket.

	Tobin's Q	**Family CEO**	**ROA**	**Family CEO**	**Z-score**	**Family CEO**
Cons.	0.914*	-0.682***	8.235*	-0.682***	9.944**	-0.682***
	(0.083)	(0.000)	(0.055)	(0.000)	(0.021)	(0.000)
Family CEO	0.094		-2.125**		-2.100**	
	(0.407)		(0.022)		(0.024)	
Board size (log)	0.403		-0.725		-0.837	
	(0.136)		(0.742)		(0.703)	
Duality	-0.004	0.784***	-0.199	0.784***	-0.204	0.784***
	(0.975)	(0.000)	(0.833)	(0.000)	(0.829)	(0.000)
Diversity	-0.234	0.459	-1.555	0.459	-1.434	0.459
	(0.458)	(0.347)	(0.543)	(0.347)	(0.575)	(0.347)
Outside director	-0.418	-0.173	-1.432	-0.173	-1.496	-0.173
	(0.132)	(0.696)	(0.526)	(0.696)	(0.508)	(0.696)
Director over 60s	0.539	0.698	5.174*	0.698	5.245*	0.698
	(0.153)	(0.229)	(0.091)	(0.229)	(0.087)	(0.229)
Foreign ownership	2.131***	-1.116**	11.891***	-1.116**	15.126***	-1.116**
	(0.000)	(0.050)	(0.000)	(0.050)	(0.000)	(0.050)
Total asset (log)	-0.078		0.162		0.134	
	(0.106)		(0.681)		(0.734)	
Capital expenditure	1.518**		21.238***		21.229***	
	(0.014)		(0.000)		(0.000)	
Debt	-0.279		-12.556***		-12.507***	
	(0.418)		(0.000)		(0.000)	
Growth in sale	-0.011		-0.284		-0.281	
	(0.784)		(0.402)		(0.407)	
Unsystematic risk	-0.023	1.219*	4.913	1.219*	4.894	1.219*
	(0.956)	(0.087)	(0.151)	(0.087)	(0.153)	(0.087)
Industry						

Sources: Author's analysis

6. Discussions and conclusion

Using data collected from 289 listed companies in the Ho Chi Minh stock exchange in 2013, this study is conducted to consider the fundamental gaps in current research by shedding light on the following areas. *First,* the family ownership is strictly considered in the new context of Vietnam. *Second,* the various aspects of family ownership (the family involvement, the relative founders, and the family CEO) and different measurement of firm performances (market measurement, accounting measurement, and risk of bankruptcy) are deliberated to analyze. *Third,* it is the empirical evidence of insignificant results of using market measurement (Tobin's Q), in the Vietnam context. *Fourth,* the empirical evidence of using the weak instrumental variable is clarified in the line of family ownership's research. *Fifth,* the problem of selection bias is deliberated in the new way of analysis by using GSEM model, not by instrumental variable (based on the mechanism of treatment effect model). *Sixth,* there is a confirmation of potential effect of unsystematic risk on firm performance since the family CEO is concerned as a mediate channel.

Based on the adoption of Vietnam corporate governance framework (IFC and state securities commission Vietnam 2006, 2010; International Finance Corporate 2012; World Bank 2013), findings from this empirical study provide evidences to confirm that family's ownership and their participation in the board structure could hurt the company's activities leading to lower accounting returns (lower ROA), and a higher risk of bankruptcy (higher Z-score). This study also considers the impact of the relatives of the founder simultaneously with family ownership. As extensive literature review indicates that family relationship comes from the founder. As a result, this person, who has set up and developed the company, has brought their family members into the company with an expectation that these relatives will strengthen the powers. However, in contrast with our expectations, the effect cannot be established when firm performance is proxied by Tobin's Q. The empirical researches presents that market stock price can be a biased estimation, occurred by: (i) there is a weak application of corporate governance (Claessens & Djankov 1999; and Phung & Hoang 2013); (ii) it is not represented for the firm performance in the emerging market (Joh 2003; and Vo and Nguyen 2014); and (iii) there is the more efficient application of the accounting measurement (Hang 2015).

Findings from this study also provide an empirical evidence to confirm the positive effect on firm's performance from several factors which are generally considered as the typical characteristics for a company board, including the experienced directors and foreign investors.

These positive effects are in accordance with the view presented in the report published by the International Finance Corporation (2012) which presented, among many, two key findings in relation to firm's performance: (i) the increasing quality of corporate governance process would be impacted significantly by the role of foreign ownership; and (ii) the board experiment (proxied by all board directors at 60 years of age or more) can provide benefits to firm's performance. Nevertheless, this study fails to provide evidence to support the link between a number of corporate governance characteristics and firm's performance for the listed firms in HOSE during the research period. These findings are somewhat consistent with the conclusions from the report of IFC and the State securities commission Vietnam (2006, 2010); and International Finance Corporation (2012), in relation to weak applications of the standard corporate governance framework in the Vietnam environment. In addition, findings from this study confirm that there is a significant positive effects of capital expenditure on improving firm's performance. However, there is a negative impact of increasing more debt on firm's performance. It should be noted from the sample that although firms without family ownership have obtained better firm performance, however, these companies have exhibited a higher proportion of debt out of their total assets in operation.

By figuring out the problem of weak instrumental variable, this study has confirmed the potential negative effect of unsystematic risk on firm performance since the family CEO is concerned as a mediate channel. This can be explained by the analysis of the family's attitude when the facing with the specific risk. Actually, James, (1999); Casson (1999); Gomez Mejia et al., (2001); and Gomez-Mejia et al., (2003) has described that family's business would tend to preclude from accessing the outside fund, limit the diversified portfolio, obtain higher cost of specific risk, and thereby exacerbate the business failure. It means that the more family business presented, the higher specific risk could be suffered, and that could lead to the low performance.

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Appendix

Variables descriptions			
No.	**Var.**	**Definition**	**Measurement**
a. Firm performance			
1.	***Tobin's Q***	The estimation of the connection between the financial market and the market of goods and services.	This ratio was developed by Brainard and Tobin (1968), has been widely used in the empirical research, such as Anderson and Reeb (2003); Barontini, and Caprio (2006); and Jameson et al. (2014); Vo and Phan (2013); and Vo and Nguyen (2014): $$Q = \frac{Equity\ market\ value + market\ value\ of\ debt}{replacement\ value\ of\ all\ production\ capacity}$$
2.	**ROA**	The interaction between the profitability and the company's assets. It demonstrates the effectiveness of using assets or the amount of net income is created by one unit of total assets.	$$\text{ROA} = \frac{Net\ income}{Total\ assets}$$
3.	**Z-score**	The risk of bankruptcy. It is presented in the research of Altman (1968), also used as the instrument for examining the company's health. The higher ratio is, the better the companies are.	This uses the weight for scoring firm performance as presented in the following model: $$\text{Z-score} = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$ • X_1: working capital divided by total assets; • X_2: retained earnings divided by total assets; • X_3: earnings before interest and taxes divided by total assets; • X_4: market value equity divided by book value of total assets; • X_5: sales divided by total assets
b. Various aspects of family ownership			
1.	**Family's involvement**	The binary variables, presents for the impact of family ownership.	It obtains the fraction equity ownership (at least 5% shareholding) of family members or the presence of family members in the board of directors and mangers. The distant relatives such as the grandmother or grandfather, father or mother, son or daughter, siblings or half-siblings, aunt or uncle, niece or nephew, cousins (first or second cousin) daughter-in-law and son-in-law will be considered as a family relationship.
2.	**Founding family**	The binary variables, expresses the simultaneous effect of family and founder	It equals 1 if a relative founder takes part in the board of directors and mangers or the founder's family member hold at least 5% of shares.
3	**Family CEO**	The binary variables, presents the family's manager in the company	It equal 1 if a relative member holds the executive position (CEO).

c. Board characteristics			
1.	**Board Size**	The size of board of directors	A number of directors on the board.
2.	**Duality**	A binary variable.	It indicates the chairman also hold the CEO position.
3.	**Diversity**	Female directors	A number of female directors. It is scaled by board size.
4.	**Outside Directors**	Board independence	A number of outside directors classified as "independent directors", scaled by board size.
5.	**Foreign Ownership**	The shareholding of foreign investors	The percentage of share outstanding owned by foreign investors
6.	**Director over 60 years**	The experiment directors	A number of directors over age 60. It is scaled by board size.
d. Financial situation			
1.	**Total Asset**	Firm's sizes	The natural log of the total assets.
2.	**Capex**	Capital expenditure	The expenditure for the buying and upgrading "the physical asset". It is divided by the total asset
3.	**Debt**	The long-term debt	The long-term debt divides by total assets
4.	**Growth in sale**	The growth in sales revenue.	One year growth in sale.
5.	**VSIC**	Vietnam standard industry codes	The Vietnam standard industry codes. It is used for controlling the characteristics of industry.
e. Strategic risks			
1.	**Unsystematic risk**	Unsystematic risk in capital asset pricing model (CAPM) (Sharpe 1964)	The specific risk is captured by obtaining the standard deviation of the residual from the regression in which firm's weekly stocks returns are regressed on the weekly VN-Index return in the period of 2011-2013: $$r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}$$