ABSTRACT

This study aims to determine the effect of ownership structure on risk-taking behaviour among the companies listed on the Indonesia Stock Exchange in the period 2013 to 2015 with a total of 390 firm observations. Companies’ risk-taking is measured through income volatility over five years. There are two types of corporate ownership structures investigated in this study: family ownership and foreign ownership. By using fixed effect panel regression, the results showed that both ownership structures have a significant negative effect upon the company’s risk taking behaviour, which implies that family and foreign ownership can function effectively to mitigate excessive risk-taking behaviour in a company.

Type of paper: Empirical

Keywords: risk taking, ownership structure, family ownership, foreign ownership

1. Introduction

The 1998 financial crisis in Russia, Asia, and, Brazil is a proof that the behaviour of the corporate sector influences the overall economy and that weak corporate governance practices endanger global financial stability (Claessens and Yurtoglu, 2013). From late 2001 to 2002, many corporations in the United States and Europe experienced bankruptcy due to weak CG practices, such as Arthur Andersen, Merrill Lynch, Halliburton, WorldCom, AOL Time-Warner, Tyco Qwest, and Health South. The financial crisis of 2008 has also revealed some weaknesses in CG mechanisms in various countries. The crisis originally began in the financial sector in the United States and Britain, then impacted other developing countries and led to huge losses in financial institutions around the world within a few months.

One of the causes of the financial crisis in 2008 was due to the behaviour of corporate executives who took risks without considering the consequences of those risks. Risks carry opportunities for disasters, losses, or poor outcomes. The financial crisis happened as a consequence of the actions of the company executives who took risks excessively (Jiraporn et al., 2012). Within the framework of agency theory, the management is usually categorised as a risk-averse entity because of the impact on reputation and jobs. However, managerial incentives -- particularly those related to company performance-- may encourage managers to take on more risks in order to achieve company performance targets (Jensen & Meckling, 1976).
Cronqvist and Fahlenbrach (2009) confirmed that shareholders with large holdings (large shareholders) can influence company policies directly through their voting rights by electing company directors and voting on changes to the company’s structure and policies. In addition, large shareholders can indirectly influence corporate policy through informal negotiations and discussions on corporate governance with the incumbent management. Indirect influence is also supported by the research of Becht et al. (2010), which states that most of the influence wielded by large shareholders in the company is exerted through an informal process. Furthermore, large shareholders can usually change their investment decisions in response to changes in company policy. They may be able to sell their shares if the company’s policies are not in line with their investment mandate and then prefer to invest in companies that adopt company policies more suitable to their interests.

The ownership structure of a company can be concentrated in one shareholder, spread unevenly among multiple shareholders, or spread relatively evenly among all shareholders. According to the World Bank’s ROSC (Reports on the Observance of Standards and Codes) on Governance in Indonesia in 2010, there are five categories of ownership structures commonly found in Indonesia, namely:

1. Family controlled groups -- a majority of listed companies are controlled by families or approximately ten large groups of family enterprises (family-owned company groups).
2. SOE -- a business entity wholly or largely owned by the state through direct investments from state assets. The Government of Indonesia controls 114 state-owned enterprises through the Ministry of State-Owned Enterprises.
3. Foreign -- foreign individuals, foreign corporations, or foreign government investments in the territory of the Republic of Indonesia.
4. Financial institutions - shares held by financial institutions such as investment firms, mutual funds, insurance companies, pension funds, and banks.
5. Independent companies that are not part of groups.

Family companies are still the most common form of organization in the world (Lee, 2006). Family firms constitute approximately 44% of all firms in Western Europe (Faccio and Lang, 2002), and more than two-thirds of all companies in East Asia (Claessens et al., 2000), including Indonesia as one of the countries where the patterns of ownership concentration and control are dominated by family units. This form of ownership structure can affect the type of agency conflicts that tend to occur. With a distributed ownership structure, agency conflicts tend to be between the principal and the agent due to the separation of ownership and management. However, in companies with ownership concentrated in family entities, agency conflicts tend to take place among the principals, particularly between majority shareholder and minority shareholders.

Countries with concentrated ownership structures are typically characterized by weak protections for minority shareholders (Young et al., 2008). Due to the weaknesses of the legal protection system for minority shareholders, majority shareholders can be tempted to exploit their control over a large proportion of ownership in the company, such as through expropriation of minority shareholders. Expropriation can take many forms; for example, the insiders (managers and controlling shareholders) can put family members in key managerial positions or make excessive payments to corporate executives (La Porta et al., 2000). This concentrated ownership can also be utilized by the controlling shareholder to direct the company’s policy in accordance with their interests, or in other words to exploit the wealth of minority shareholders, although on the
other hand the policy may benefit the non-controlling shareholders instead. This phenomenon is also known as negative entrenchment effect (Claessens et al, 2002)

The characteristics of family firms tend to be unique and different from non-family companies. Family firms usually place family members in key management position, either as top executives or as directors, and actively involve them in the management of the company. The second characteristic is that firms with family ownership have a long-term perspective for future viability rather than short-term profits. That’s because they generally consider the company as an asset to be passed on to future generations (Anderson and Reeb, 2003). Third, companies with family ownership typically have an undiversified portfolio due to the concentrated ownership pattern in the company (Cheng, 2014). Since most of the investor’s assets are invested in the company, the family business tends to be more risk averse, preferring to protect their capital and their wealth rather than acting in riskier or more innovative ways.

In addition to family-dominated corporate ownership structures, Whang and Rhee (2008) suggested that approximately 70% of corporate stocks in Indonesia from 2002 to 2007 are held by foreign institutions, which is equivalent to nearly 40% of the total market capitalization. The KSEI (Central Securities Depository of Indonesia) report in 2015 also stated that that foreign ownership, both by individuals and by institutions, still dominate the Indonesian capital market to the tune of 63.79%. When foreign investors have a substantial proportion of ownership, they may tend to urge companies to restructure for better efficiency. This tendency is also found in countries with economies in transition, where foreign investors are considered to have superior techniques and skills in terms of company management and restructuring (Estrin et al., 2009). Restructuring due to the presence of these foreign investors in the company is expected to increase the volatility of income and hence to increase the level of risks taken.

Restructuring by foreign investors can be done in various ways such as the implementation of innovative investment projects, which can impact the uncertainty of cash inflows, which in turn is expected to impact income volatility. In addition, Ferreira and Matos (2008) also found that foreign investors are more active than local investors in advocating better corporate governance. This can have an impact upon the company’s investment policy. John et al., (2008) suggested that increased foreign ownership in the company leads to the improvement of corporate governance and hence affects the company’s managerial risk-taking activities.

With reference to this, we intend to conduct research on whether the ownership structure of a company, especially family- or foreign- dominated ownership structures, affects the company’s risk-taking behaviour. Several previous studies have examined this issue, such as Boubakri et al., (2013) who examined the influence of foreign and government ownership upon the degree of risk-taking in a sample of 57 countries. The results of this study indicated a negative effect from government ownership and the positive impact of foreign ownership upon companies’ risk-taking behaviour. The study also drew on research by Su and Lee (2013), who studied the effect of the corporate governance mechanisms on risk-taking behaviour among family firms in Taiwan. The results of this study indicate that there is a negative influence from family ownership against companies’ risk-taking behaviour.

This study differs from the research conducted by Boubakri et al. (2013) and Su and Lee (2013) in terms of the samples used. Boubakri et al. (2013) used a sample of newly privatized
companies, while in this study the samples are public companies in the manufacturing sector from 2013 to 2015. The manufacturing sector significantly promotes industrial development in a country and has an important role in the national economy. From about 1970 to the present day, the manufacturing sector has accounted for a substantial contribution to GDP and national non-oil exports. In addition, this study used measurements of income volatility for five years as a proxy of companies’ risk-taking, whereas in the proxy used in Su and Lee (2013) was Research and Development (R&D) intensity. Previous studies also limited their investigation to a single type of ownership each, while this study incorporates two types of ownership commonly found in the Indonesian context.

2. Literature review

2.1 Agency Theory

Agency relationships are defined by Jensen and Meckling (1976) as contractual agreements between company owners (shareholders, principals) and others (corporate managers, acting as agents) involving the delegation of some authority to agents to make decisions and to manage the company. The agent is trusted by the principal to perform various managerial tasks within the company.

The emergence of the agency theory is due to the separation of ownership and management that arose as company management began to manage and control assets that are not theirs (i.e. principals’ assets) (Jensen and Meckling, 1976). In practice, there is often a divergence of interests between managers and shareholders, which is termed as an agency problem. When both parties are equally eager to maximize benefits or utility for themselves, it makes sense if the manager does not always act in the shareholders’ best interests. Because shareholders cannot supervise the managers’ performance in detail, problems may arise in the form of hidden information and hidden actions for the sake of personal interest that could have adverse impact on the principal. In addition, managers sometimes have more information than shareholders (asymmetry of information) (Johnson and Droege, 2004).

Shleifer and Vishny (1997) and Young et al (2008) stated that there are two possible potential agency issues related to ownership, i.e. conflict between principal and agent and conflict between principal and principal.

1. Principal - Agent (PA) conflict. In this first type, shareholders and management have different interests (Jensen and Meckling, 1976). This type of agency conflict tends to be found in countries with dispersed ownership. The dispersed means that no single principal has the capability and willingness to supervise and control management. Therefore, management can freely execute the managerial functions of the company in accordance with its own interests.

2. Principal - Principal (PP) conflict. In this second type, a different conflict of interest occurs between controlling shareholders and non-controlling shareholders (Shleifer and Vishny, 1997). This type of agency conflict tends to be found in countries with concentrated ownership. This concentrated ownership can be utilized by the controlling shareholders to direct the company’s policy in accordance with their interests, although on the other hand such policies may inadvertently benefit non-controlling shareholders.
2.2 Family Ownership

Dispersed ownership structure (wide-spread) is found only in the United States and Britain. In other developed and developing countries, especially in countries with weak investor protection, most companies are still under a concentrated ownership regime (La Porta et al., 2000). Claessens et al. (2000) further examined the ownership structure of 2,980 listed companies in nine East Asian countries, including Indonesia. Identification of ownership structure was done by calculating the cash flow rights and control rights traced to ultimate ownership. The result was that ownership structures in East Asia tend to be concentrated with controlling shareholders acquiring control through pyramid structures and cross-holdings. This result also showed that 60% of the companies categorised as having concentrated ownership structures were controlled by families as ultimate owners. Of the nine sample countries, Indonesia is one of the countries with the highest degree of family domination over the pattern of ownership and control. This dominance of ownership has implications for the high potential for expropriation in Indonesia (Diyanty, 2012).

2.3 Definition of Family Ownership

Thomsen and Pedersen (2000) defined family ownership as a dual role for the family as both owners and managers of the company. Eighty percent of all companies in Indonesia experience family interference in management and in the selection of directors and company commissioners (Lukviarman, 2004; Diyanty, 2012). Arifin (2003) defined family firms into four categories based on their ownership structure. In this study the authors use the third definition of family from Arifin (2003), which is the whole family of individuals and associated companies except for public, state, financial institutions and foreign investments with a 50% ownership interest, to identify whether the company is owned and controlled by a family.

2.4 Foreign Ownership

Agency issues affect all types of shareholder groups, including foreign shareholders. Foreign shareholders also have limited oversight of the management due to differences between the business environment in the originating country (home country) and the destination country (host country). Furthermore, Boubakri et al. (2013) stated that foreign investors offered parts/ portions of newly privatized state-owned enterprises are more likely to make capital budgeting decisions that would increase the volatility of income, such as taking on a riskier project.

From 2002 to 2007, approximately 70% of free shares (free float) in Indonesia were held by foreign institutions, which is almost equivalent to 40% of the total market capitalization (Wang and Rhee, 2008). In addition, the report by KSEI (Central Securities Depository of Indonesia) in 2015 stated that foreign ownership, both by individuals and by institutions, still dominates the Indonesian capital market to the tune of 63.79%.

2.5 Development of Hypotheses

2.5.1 Family Ownership and Corporate Risk-Taking

Family firms are more risk-averse than non-family companies. This idea is supported by the finding that family firms invest less in R & D projects because such projects are considered to
be riskier (Le Breton-Miller et al., 2011; Munoz-Bullon and Sanchez-Bueno, 2011; Croci et al., 2011; Anderson et al., 2012; Su and Lee, 2012). Another example lies in the company’s debt policy, where the family company implements a lower debt rate than a non-family company, since debt is perceived to jeopardize the existence of the company. The risk-averse nature of family companies was also indicated in the studies by Anderson et al. (2012), George et al. (2005), Su and Lee (2012).

Moreover, family firms are more focused on long-term policies and are reluctant to endanger their wealth (Su and Lee, 2012). In a company owned by the founding family, maximisation of the company’s value is not the main concern because value is not the sole purpose. Instead, the purpose is to be able to pass on the company to future generations so that the management cannot take personal advantage of their control over the company (Anderson and Reeb, 2003; Burkart et al., 2003). Anderson and Reeb (2003) in Boubaker et al. (2016) stated that companies with the largest proportion of shares held by controlling shareholders take less risk because the controlling shareholder’s investment is usually not diversified. Since most of their wealth is invested in the company, such shareholders tend to be more risk-averse, preferring to protect their capital and wealth rather than acting in more innovative ways by taking riskier projects. For this reason, the hypothesis is formulated as follows.

H1: Family ownership has a negative effect on companies’ risk-taking

2.5.2 Foreign Ownership and Corporate Risktaking

Djankov and Murrell (2002) and Estrin et al. (2009), argue that foreign investors push companies to undertake major restructuring after privatization. In addition, the restructuring by foreign investors is expected to increase income volatility and hence the level of risk to be taken. Many studies claim that foreign investors could affect the company’s risk taking behaviour through improved corporate governance (GCG as a moderating variable that strengthens the association of foreign ownership with risk taking). Gillan & Starks (2003) and Ferreira & Matos (2008) argue that foreign investors tend to be more active than local investors in advocating better corporate governance, which may affect investment policies. Stulz (1999) and John et al. (2008), argue that the increased foreign ownership in a company leads to an improvement in corporate governance and therefore has implications for managerial risk-taking activities.

The effects of foreign investors are expected to be positive as they tend to be large institutions that have the power to influence corporate policy (Shleifer and Vishny, 1986; Gillan and Starks, 2003; Cronqvist and Fahlenbrach, 2009). In particular, they can reduce the tendency of managers to take inadequate risks. In addition, foreign investors seek to increase diversification through their international investments. This diversification is likely to encourage corporate risk-taking as evidenced in the study by Faccio, Marchica, and Mura (2011). For this reason, the hypothesis is formulated as follows.

H2: Foreign ownership has a positive effect on companies’ risk-taking

3. Research Method

This study uses a model that refers to Boubakri et al. (2013) to measure foreign ownership. Foreign ownership variables are used to measure the amount of a company’s shares owned by foreign investors at the end of the research period. To measure family ownership, this study uses the definition of family ownership by Siregar and Utama (2008), which refers to the
third definition of family by Arifin (2003) i.e. all the individuals and registered companies associated with a family, except for public, state, and financial institution and foreign investors with a 50% ownership interest, to identify whether the company is owned and controlled by the family.

For the measurement of risk-taking, this study uses the variable of the standard deviation of Return on Assets (ROA) over five years. This indicator is a comprehensive measure of the level of risk since this indicator reflects the company’s operational decisions (John et al., 2008). The greater the standard value of an enterprise’s deviation, the riskier the operational decisions. This study aims to test the effect of independent variables -- the ownership structure of the company, particularly family ownership and foreign ownership -- upon the dependent variable, namely the corresponding company’s risk-taking behaviour.

The research model to test hypotheses 1 and 2 is as follows.

$$CRT_{it} = \beta_1 FAMOWN_{it} + \beta_2 FOREIGNOWN_{it} + \beta_3 ROA_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \beta_6 CAPEX_{it} + \beta_7 SGROWTH_{it} + \varepsilon_{it}$$ (1)

Information:

- **CRT<sub>i,t</sub>**: Corporate Risk Taking by firm i in year t
- **FAMOWN<sub>i,t</sub>**: Percentage of shares owned by family i in year t
- **FOREIGNOWN<sub>i,t</sub>**: Percentage of foreign-owned stake in firm i in year t
- **ROA<sub>i,t</sub>**: The ratio of EBITDA to total assets at the firm i in Year t
- **LEV<sub>i,t</sub>**: Level of debt of firm i in year t using the ratio of total debt to total assets
- **SIZE<sub>i,t</sub>**: Size of firm i in year t using natural logarithms of total assets
- **CAPEX<sub>i,t</sub>**: The rate of use of capital of firm i in year t calculated using the ratio of capital expenditure to total assets.
- **SGROWTH<sub>i,t</sub>**: The company growth rate as measured through the percentage change between sales in year n and year n-1

3.1 Methods of Data Collection and Sampling

The data used in this study is secondary data derived from the financial statements and annual reports of companies listed on the Indonesia Stock Exchange. Supporting data are also collected from the Indonesian Capital Market Directory, Data Stream Thomson Reuters and Eikon.

The population encompasses all companies in the manufacturing sector that are listed on the Indonesia Stock Exchange and have published the financial statements during the years 2013 to 2015. The data used is still relatively recent to maximise the relevance of the research results. This study uses a purposive sampling method. Purposive sampling is a method of selecting samples by adjusting the information needs based on criteria that have been previously established. The selected sample comes from only one industry sector to avoid complications from differences in the characteristics of companies engaged in different industries. The manufacturing sector was chosen because the number of companies in this industry sector is the largest compared to other industries listed on the Indonesia Stock Exchange (IDX).
3.2 Operationalization of Research Variables

3.2.1 Dependent Variables

Risk taking is measured using the standard deviation of the ROA over five years as described in Faccio, Marchica and Mura, (2011). The standard deviation of the ROA used in this research is as follows.

\[
RISK_{i,t} = \sqrt{\frac{1}{T-1} \sum_{t=1}^{T} (ROA_{i,t} - \frac{1}{T} \sum_{t=1}^{T} ROA_{i,t})^2}
\]

Information:
- \(ROA_{i,t}\): Return on Assets in firm i in year t.
- \(EBITDA_{i,t}\): The company’s earnings before interest expense, taxes, depreciation and amortization at company i in year t.
- \(TA_{i,t}\): Total assets of firm i in year t.
- \(Q\): Measurement of 5-year volatility of return on assets.

3.2.2 Independent Variables

3.2.2.1 Family Ownership

This study uses the definition (3) in the Arifin (2003), which ownership by family-affiliated individuals and companies (over 5%), excluding state companies, financial institutions, and foreign investors. The ownership limit of 50% shareholding is used to identify whether the company is owned and controlled by a family. It also refers to Siregar and Utama (2008) and Lidwina and Wardhani (2011) in that an ownership share of ≥ 50% gives the investor control over the company, including in terms of risk-taking behaviour. Family ownership is measured as the percentage of shares owned by a family out of the number of shares outstanding.

3.2.2.2 Foreign ownership

Foreign ownership is measured using the percentage of foreign ownership of company shares held at the end of each period, after Boubakri et al. (2013). Foreign ownership is defined according to the definitions from KMK No. 1055 / KMK.013 / 1989 as the share of foreign ownership, either by individual foreign nationals or by foreign institutions / legal entities. Foreign ownership is measured as the percentage of shares owned by foreign investors out of the number of shares outstanding.

4. Results and Discussion

The hypothesis testing results are depicted in the table 1.

4.1 The Influence of Family Ownership on A Company’s Risk-taking

According to the results in the tables, the influence of family ownership against companies’ risk-taking can be seen from the negative coefficient on the variable value FAMOWN, which means that family ownership negatively affects risk taking. The probability value of 0.015,
Table 1. Regression Results

| Hypothesis 1 : Family ownership has a negative effect on companies’ risk-taking |
| Hypothesis 2 : Foreign ownership has a positive effect on companies’ risk-taking |

**Research Model:**

Dependent Variables: CRT

<table>
<thead>
<tr>
<th>Independent Variables:</th>
<th>expected Sign</th>
<th>Coefficient</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMOWN</td>
<td>-</td>
<td>-0.1204</td>
<td>0.015 **</td>
</tr>
<tr>
<td>FOREIGNOWN</td>
<td>+</td>
<td>-0.1145</td>
<td>0.038 **</td>
</tr>
<tr>
<td>ROA</td>
<td>-</td>
<td>0.0019</td>
<td>0.488</td>
</tr>
<tr>
<td>LEV</td>
<td>+</td>
<td>0.0786</td>
<td>0.008 ***</td>
</tr>
<tr>
<td>SIZE</td>
<td>-</td>
<td>-0.0065</td>
<td>0.403</td>
</tr>
<tr>
<td>CAPEX</td>
<td>+</td>
<td>0.0063</td>
<td>0.426</td>
</tr>
<tr>
<td>SGROWTH</td>
<td>+</td>
<td>0.0001</td>
<td>0.030 ***</td>
</tr>
</tbody>
</table>

R-squared (within) 0.1013

Prob> F 0.0000

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

Number of observations = 390. CRT = companies’ risk-taking is measured by the standard deviation of company ROA over five years; FAMOWN = Percentage number of shares owned by the family out of the number of shares outstanding; FOREIGNOWN = Percentage number of shares owned by foreign investors relative to the number of shares outstanding; ROA = ratio of EBITDA divided by total assets; LEV = ratio of total liabilities to total assets; SIZE = natural logarithm of the company’s total assets; CAPEX = ratio of capital expenditure to total assets; SGROWTH = Percentage of change in sales in year n compared to year n-1

means that the influence of family ownership upon risk taking is significant at the 5% level. This means that the greater the family ownership in a company, the lower the risk-taking tendency. The results of the regression test are in accordance with the hypotheses.

The results are consistent with Su and Lee (2012), where family companies are more conservative in risk-taking. The lower level of risk-taking in firms with family ownership can also be due to the motive to protect the family’s capital and wealth within the company (Su and Lee, 2012). Anderson and Reeb (2003) in Boubaker et al. (2016) stated that the company with the largest controlling shareholders take less risk because the controlling shareholder’s investment is usually not diversified. Since most of their wealth is invested in the company, these shareholders tend to be more risk averse.

4.2 Influence of Foreign Ownership on Company’s Risk Taking

In the regression results in the table, the effect of foreign ownership on risk taking can be seen from the negative coefficient on the variable FOREIGNOWN, which means that foreign ownership negatively affect companies’ risk-taking. Judging from the probability value of 0.038, we can say that the influence of foreign ownership on companies’ risk taking is significant at the 5% level. It means that the greater the foreign ownership in a company, the lower the risk-taking tendency in the company. The result of the regression test is not consistent with the formulated hypothesis.
Cheng et al. (2011) states that if the foreign investor has a significant proportion of ownership in a company, they may have an incentive to restrict the company’s risk-taking behaviour in order to prevent substantial losses to their portfolio at a specific point in time. Vo (2016)’s research in Vietnam concluded that there is a significant negative effect between the two. The existence of foreign investors tends to reduce risk-taking activities undertaken by local company managers. This implies that foreign investors are likely to focus on a long-term perspective in the invested company as opposed to short-term gains (Vo, 2016).

5. Conclusions

Based on the hypothesis test results, both family ownership and foreign ownership have significant negative effects upon companies’ risk-taking behaviour. The negative effect of family ownership towards risk taking is in accordance with the hypothesis in the study but the negative effects of foreign ownership contradict the corresponding hypothesis. It shows that the greater the portion of family and foreign ownership in a company, then the less likely the company is to take risks.

Family ownership proved to have a significant negative effect on risk-taking in companies. Companies with a high family stake tend to be more conservative in risk-taking. Family companies tend to be risk-averse in order to protect the family’s high share of ownership in the company.

Foreign ownership was not proven to have a positive effect on risk-taking. Foreign investors tend to reduce the risk-taking activities undertaken by local company managers. This implies that foreign investors are likely to focus on a long-term perspective in the company as opposed to short-term gains (Vo, 2016).

5.1 Research Limitations

This study still has limitations that need to be addressed in future studies, including:

1. The sample used in this study only includes companies engaged in the manufacturing industry. For further research it is recommended to broaden the sample of companies.
2. Different definitions of family ownership may result in different interpretations of research results. For further research, it is recommended to use a clearer definition of the family, such as by looking at the ultimate ownership in order to minimize bias.
3. The percentage of foreign ownership still contains subjectivity and limited sources of trustworthy information. Information regarding foreign ownership was only obtained from annual reports and the Internet. In addition, foreign ownership in Indonesia can also be categorized as family ownership as many instances of foreign ownership are quite concentrated. For further research, it is suggested to define foreign ownership criteria in a manner more appropriate to the conditions in Indonesia in order to reduce bias.
4. This study did not test the sensitivity of the risk-taking measurement. Follow-up studies are recommended to use two proxy measurements for risk-taking, namely the standard deviation of Tobin ‘s Q and the standard deviation of stock returns as used in Nguyen (2011).
References


