

## IMPACT OF OWNERSHIP CONCENTRATION ON THE INNOVATION OF SMALL AND MEDIUM-SIZED ENTERPRISES

Oanh D.L.K, Nguyen H.T., Linh N.T.X., Nhan D.T.T.\*

**Abstract:** The study was conducted to assess the impact of ownership concentration on the innovation of Small and Medium-sized Enterprises (SMEs) in Vietnam. Furthermore, innovation is seen as an important element in creating competitiveness to achieve long-term development for a company. This topic has been reported in many previous pieces of research where innovation is often measured through the number of patents. However, this study measures the innovation of SMEs through whether these businesses introduce products/services or introduce a new production process or new technology in 3 years. By Logit Bayes regression method, the research results show that ownership concentration harms the innovation of SMEs in Vietnam. The authors explain this result through channels like "access to capital" and the "Risk aversion" channels.

**Keywords:** Ownership Concentration, Innovation, SMEs, FDI and Bayes.

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### Introduction

According to the Organisation for Economic Co-operation and Development, "Innovation is the implementation of a new or significantly improved product (goods/service) or process, a new marketing method, or a new organizational measure in operational practice in the organization of work or external relations" (OECD, 2005). Innovation premises a competitive advantage for an enterprise's long-term development in today's fast-moving society. Enterprises constantly improve their innovative ability to survive and develop during globalization (Lesáková, 2014). It can be seen as a key role in the growth rate, which is the main driver of economic growth (Aghion et al., 2013). Most companies in emerging markets enter innovation activities and technology, concentrating on setting and implementing new product phases, marketing tools, or established organizations used in other developed countries (Ayyagari et al. 2011). However, innovation pursuing is related to huge and costly capital investments (Shane & Ulrich, 2004). A series of studies examining the innovation factors have been carried out (Gao et al., 2018). The results are paramount in the innovation for the corporate, industry, and

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\* **Dao Le Kieu Oanh**, Faculty of Banking, Hochiminh University of Banking, Vietnam. **Hong Thu Nguyen**, Thu Dau Mot University, Binh Duong, Vietnam. **Nguyen Tran Xuan Linh**, Faculty of Accounting - Finance and banking, Ho Chi Minh City Industry and Trade college, Vietnam. **Do Thi Thanh Nhan**, Faculty of finance and banking, Ton Duc Thang university, Hochiminh university, Vietnam.

✉ corresponding author: thunh@tdmu.edu.vn

national levels that support policymakers and the owners. According to the Vietnam White Paper (2020), Small and Medium-sized Enterprises (SMEs) make up the majority of Vietnam's business class (more than 97%), employing nearly half of the total workforce and contributing significantly to more than 40% of GDP each year. Therefore, the study of factors influencing SMEs' creativity is important for enterprises themselves and the sustainable development of the national economy. In this study, the research team will evaluate the impact of ownership concentration on the innovation of SMEs. This is a controversial topic among researchers (Iwasaki and Mizobata, 2020). With an accessible data source, the authors focus on reviewing the ownership concentration and creative activities of SMEs in Vietnam with the data updated to 2015.

### Literature Review

The ownership concentration plays an integral role in corporate governance that reduces management rights issues arising from the separation of ownership and management and improves firm performance (Shleifer & Vishny, 1986). Moreover, ownership concentration can be financially constrained because the firms depend heavily on the assets of major shareholders when they need to generate internal cash flow for financing (Wang & Shailer, 2015). According to agency theory (Jensen and Meckling, 1976), the owners are concerned with maximizing value and long-term profits, while the managers tend to enhance personal wealth, job security, or short-term goals (Baysinger et al., 1991). Some argue that a high failure rate in innovation does not give immediate results and can be risky for top positions (Alchian & Demsetz, 1972; Baysinger et al., 1991). Managers do not seem to invest in innovation. Francis and Smith (1995) believe that diffusely held firms are less innovative than firms with a concentration of ownership. This could mean that SMEs owned by one owner (higher degree of ownership concentration) are more efficient in product innovation than those with multiple owners. Similar to Kornecki (2011), the paper concluded that SMEs encourage innovation capacity. Then, Eng and Shackell (2001) found a positive correlation between concentrated ownership and R&D. This finding is confirmed by Aghion et al. (2009) and Bayarc et al. (2014). Some previous papers also confirmed the inverse relationship between innovation and ownership concentration. Hope et al. (2011) argued that controlling ownership can increase financial constraints due to the rise in agency costs and asymmetric information problems. As a result, concentration-owned companies could suffer from resource shortages for R&D and capital-intensive activities. In addition, there is a potential risk of interference from major shareholders, undermining the innovation initiative of managers by major shareholders (Edmans, 2014). Rossi and Cebula (2015) and Rapp and Udoieva (2017) indicated the negative relationship between ownership concentration (measured by the percentage of shares held by the three major shareholders) and innovation activity (measured by research and development costs). Choi et al. (2012) showed that the central owner (measured by

the ownership structure of the five major shareholders and major owners) does not affect the company's innovation as the existing data could not clearly predict the ownership effect along with the innovation. Minetti et al. (2015) suggested that ownership concentration has a negative effect on innovation, significantly reducing firms' R&D efforts. Similarly, Rossie and Cebula (2015) used balanced panel data from 369 observations of 5 companies to confirm the negative relationship between ownership structure and R&D investment in public companies in Italy from 2005 to 2013. Recently, Nguyen et al. (2021) used the data set of 27,623 SMEs in 95 countries, covering eight surveys of the World Bank from 2011 to 2018, to re-examine the relationship between the concentration of ownership and innovation activities of SMEs. Research results investigated a negative relationship between the level of ownership concentration and innovation activities of small and medium enterprises.

From the theoretical basis and the results of empirical research, the following hypothesis is given H1: Ownership concentration impact negatively on the innovation of SMEs.

### **Research Methodology**

To conduct this research, the authors use the data from the SMEs survey by the Central Institute for Economic Management (CIEM) under the Ministry of Planning and Investment, Institute of Labour Science and Social Affairs under the Ministry of Labor, War invalids and Social Affairs Vietnam and Economic Development Research Group of Copenhagen University in Denmark. The research had 2647 SMEs around Vietnam participating in the survey. However, the research is conducted by enterprises with two or above owners, so the sample included in this research is only 356 SMEs.

Currently, this dataset has been updated to 2015, which is the most updated data. These data surveys effectively represent the only data source providing information on the innovation of SMEs in Vietnam.

According to Bayesian statistics, the data study is combined with a priori information to calculate the posterior distribution. The result is interpreted as a probability distribution of parameter values. The Bayesian method can overcome the small sample disadvantage in studies (Mariëlle et al., 2017). Numerous articles and books detail Bayesian statistics' advantages and disadvantages in social science research (Howard et al., 2000; Gelman & Hill, 2007; Kruschke, 2011). Moreover, the most outstanding advantage of Bayesian statistics is that it can handle the small sample problem. McNeish (2016) highlights that Bayesian statistics is approachable and popular. More experimental research is on a Bayesian approach to modeling small sample data. According to Schoot (2016), the number of experimental studies using the Bayesian method has increased nearly fivefold between 2010 and 2015. So, the authors apply Bayesian econometrics to evaluate the impact of ownership concentration on SMEs in Vietnam.

***Dependent variable***

Qi and Ongena (2020) and Bhattacharya and Bloch (2004) apply the innovation products/services or production process to measure the creative capacity. This approach suits SMEs, especially in developing countries like Vietnam. Therefore, in this research, the authors will inherit Bhattacharya and Bloch (2004) and Qi and Ongena (2020) to measure the innovation capacity of enterprises, meaning that SMEs are innovative when they develop or introduce products and new services or improved products/service or manufacturing process. To initialize the variable to measure the innovation capacity of enterprises, the authors use questions named Aq121 and Aq123 to investigate whether the enterprise has introduced new products/services within the past 3 years. Aq121 is "Has the firm introduced new product groups since 2013?", and Aq123 is "Has the firm introduced new production processes/new technology since 2013."

***Independent variable***

To measure ownership concentration, the authors used the percentage of shares that are held by the firm's largest shareholder (Gedajlovic & Shapiro, 1998). The higher the value means, the greater the concentration of business ownership. The enterprises with only one owner will be excluded from the sample.

***Control variables***

*The academic level of business managers:* highly educated managers may absorb and accept new technologies leads to a higher innovation capacity (Sözbilir, 2018).

*Firm Age:* Enterprise age is defined as the number of operation years starting from when it was established (Rossi & Cebula, 2015). The long operating time strengthens the communication and idea exchange in the employee groups. This could create favorable conditions for the emergence of cross-functional working groups that can benefit from innovation development (Chatterjee & Bhattacharjee, 2020).

*Enterprises located in industrial zones, export processing zones:* Research by Audretsch and Feldman (1996) stipulates that the rate of product innovation is faster for enterprises located in the economic cluster than for enterprises outside the cluster.

*Enterprises with export activities:* Enterprises with export activities will have the opportunity to participate in world markets that need new products to compete with others (Aghion et al., 2018).

*Firms with a website:* Ramayah et al. (2016) indicated that an official website will provide detailed information about the company's activities and new products at each stage to customers.

*Financial statement audit:* Cole and Frost (2018) believed that audited financial statements improve reports' transparency. In a transparent information environment, managers will facilitate innovation activities of enterprises and easily access credit sources to finance their innovation activities.

***Characteristics of Provincial Competitiveness***

*Institution:* Beck et al. (2006) emphasize a country's institutional quality in reducing restrictions on enterprises' investment activities. In addition, Love and Martínez Pería stated that when the quality of institutions increases, it promotes the

development of the financial system, thereby reducing the impact of credit barriers on entities in the economy. Research by He and Tian (2020) also affirms that institutional quality positively impacts SMEs innovation.

*FDI*: Natural logarithm of FDI in the province (Ascani & Gagliardi, 2015).

**Research design**

$$Pr(INV = 1) = \alpha + \beta * CON\_CAP + \gamma * E + \theta * P + \varepsilon$$

INV: collective variable for enterprise's creative capacity; CON\_CAP: the level of ownership concentration; E: collective variable for firm characteristics; P: collective variable for Provincial Competitiveness.

**Table 1. Descriptive variable.**

Variable	Variable concept	Expectation	Questions
INV	Dummy variable takes the value 1 if the business introduces a new product or introduces a new production process and 0 otherwise		Aq121 and Aq123
CON_CAP	The proportion of equity held by the largest shareholder	+/-	Aq12ca
EDU	Academic level: No education (0), Not finished primary (1), Not Finished secondary (2), Not Finished high school (3), Finished upper high school(4)	+	Aq27b
AGE	Natural logarithm of enterprise age	+	Aq6a
SIZE	Natural logarithm of enterprise total asset	+	Eaq1h_14
LOCA	Dummy variable takes the value 1 if the enterprise is located in an industrial park, high-tech zone, or export processing zone and 0 for otherwise	+	Aq5a
EXP	Dummy variable takes the value 1 if the enterprise has export activities and 0 otherwise	+	Aq51a
WEB	Dummy variable takes the value 1 if the business has a website and 0 otherwise	+	Aq3f
AUDIT	Dummy variable takes the value 1 if the firm's financial statements are audited and 0 otherwise	+	Aq85a
PCI	Provincial Competitive	+	
FDI	Natural logarithm of FDI in the province	+	

**Source:** Own study.

Most previous papers have been done with the frequency approach, and a priori information is not available, then the Logit Bayes regression model is used. Gelman

et al. (2008) suggested Cauchy (0, 2, 5) for all coefficients and Cauchy (0, 10) for the constants.

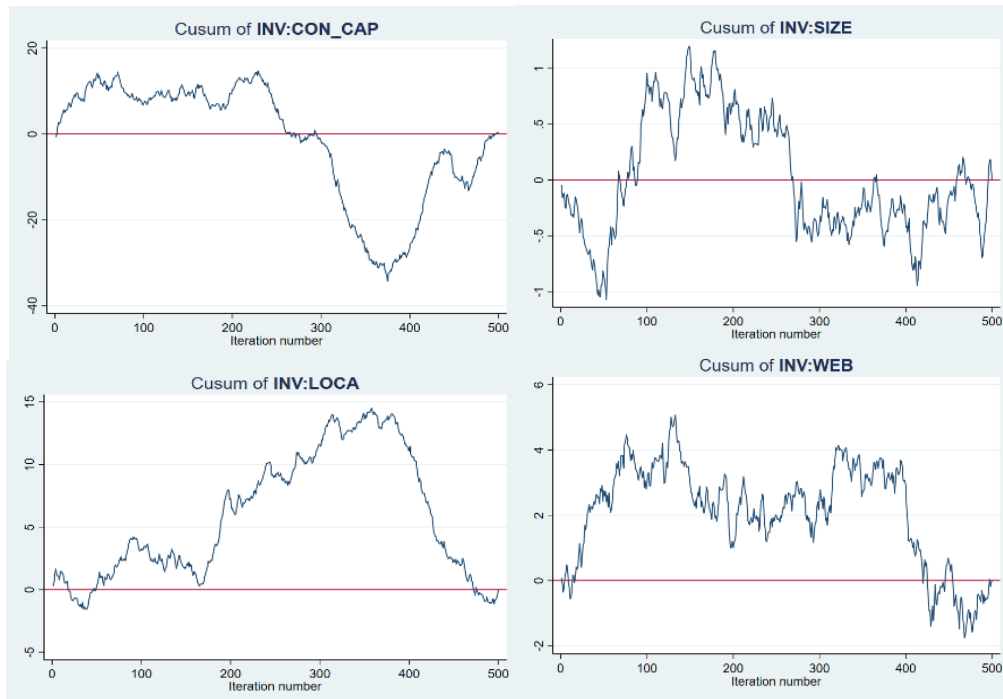
## Research Results

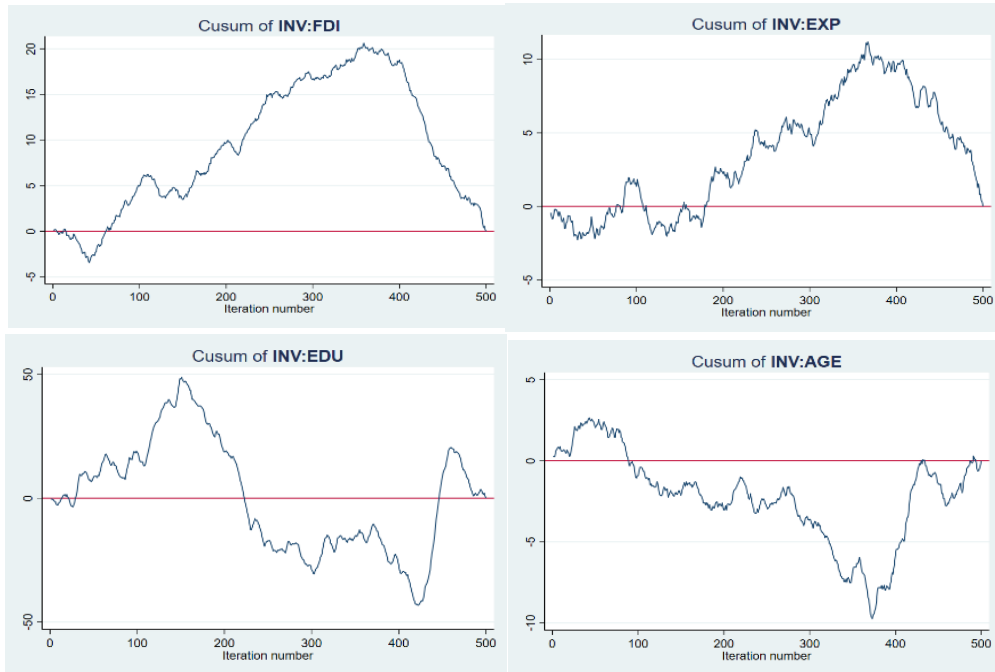
**Table 2. Descriptive statistics.**

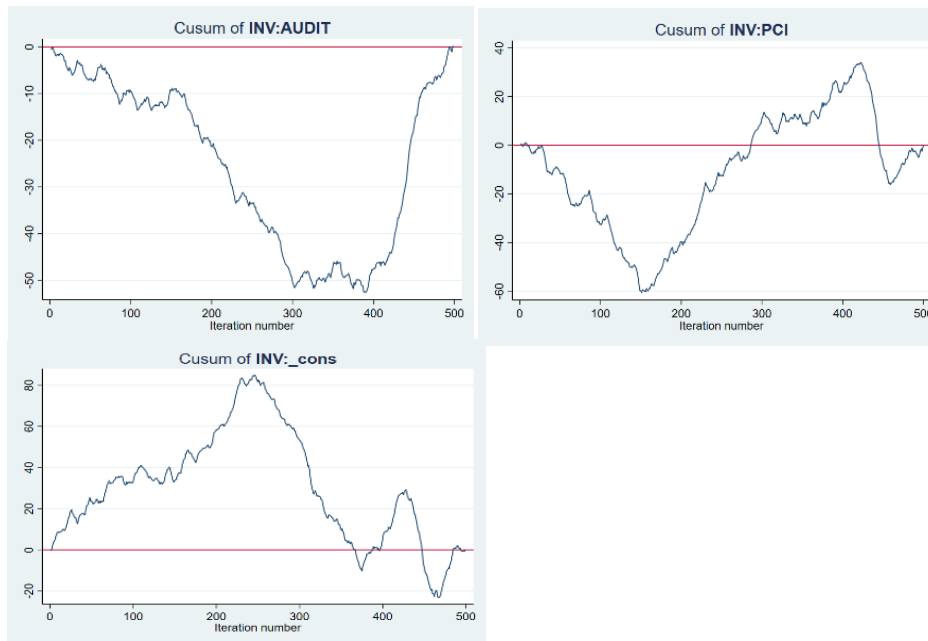
Variable	Obs	Mean	Std. Dev.	Min	Max
INV	355	0.29	0.45	0	1
CON_CAP	355	0.57	0.16	0.1	0.96
EDU	355	3.98	0.15	3	4
AGE	355	2.49	0.57	0.69	4.11
SIZE	355	8.84	1.51	4.28	14.27
LOCA	355	0.24	0.43	0	1
EXP	355	0.24	0.43	0	1
WEB	355	0.42	0.49	0	1
AUDIT	355	0.946	0.225	0	1
PCI	355	4.09	0.02	4.07	4.12
FDI	355	4.21	0.53	2.68	4.62

Source: Own study.

Table 2 illustrates descriptive statistics of the variables in the research. From the result, the level of ownership concentration in the research sample is considerably high, accounting for 57%, while the number of SMEs with innovation activities is just about 30%. Besides, the authors conduct converging diagnostics by image through Cusum chart in Figure 1.







**Figure 1: The Cusum.**  
Source: Own study.

Cusum graphs can also be used to evaluate the sequence shuffle rate. The slower the sequence shuffles, the smoother the Cusum cells. In contrast, the faster the sequence shuffles, the rougher the Cusum cells. Figure 1 shows the Cusum plot of the parameters with a sawtooth intersecting the x-axis many times, which offers a mixture of Cusum graphs and can confirm that the MCMC sequence meets the convergence conditions.

**Table 3. The relationship between innovation and ownership concentration.**

Dependent variable: INV						
	Model 1		Model 2		Model 3	
	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
CON_CAP	-0.9424*	91.40%	-0.9547*	92.90%		
<b>Firms characteristics</b>						
EDU	1.5150*	93.20%			5.6461***	99.60%
AGE	0.0653	61.60%			0.1658	79.00%
SIZE	0.1784**	98.40%			0.1967***	99.20%
LOCA	0.141	70.80%			0.1959	77.40%
WEB	0.4066*	92.80%			0.3446*	90.00%
EXP	0.2663	82.60%			0.2542	82.40%
AUDIT	1.6103***	100%			0.8342*	91.60%
<b>Province characteristics</b>						



PCI	17.8562** *	100%			12.2679**	98.00%
FDI	- 1.2232***	100%			-0.9999***	100.00%
Acceptance rate		0.1868		0.218		0.2674
Efficiency min		0.0463		0.1153		0.0364
Observations		355		365		365

**Note:** Symbols (\*\*\*), (\*\*), (\*) indicate statistical significance levels of 1%, 5%, 10%, respectively. Source: the authors' calculations.

Table 3 presents the results of Bayesian regression on the impact of the CON\_CAP variable and other control variables listed in the previous section on the innovation activities (INV) of SMEs. Bayesian method allows us to determine the impact rate of the independent variables on the dependent variable.

The independent variables belonging to specific enterprises tend to promote innovation activities in SMEs, in which there are factors with a very high probability of impact, such as EDU with a probability of positive impact is 93.2%, size is 98.4%, an enterprise with the website is 92.8%, and enterprises with independent audit is 100%. The remaining factors also tend to positively impact SMEs' creative capacity for innovating. Specifically, enterprises with female managers have a positive probability impact of 83.4%, the operation years are 79.6%, LOCA is 70.8%, and enterprises with a website are 82.2%. All macro-control variables certainly impact SMEs' innovation activities when the probability of the impact on these factors is up to 100%. Specifically, provincial competitiveness has encouraged innovation activities in SMEs. This result is similar to the study of He and Tian (2020), where institutional development positively impacts the promotion of SME innovation activities. FDI has a negative impact on the creative capacity of SMEs. This can be explained that FDI enterprises have an advantage with capital and technology that have attracted well-educated resources in the province, so it is difficult for SMEs to get access to this labor force, which can cause the limited creativity of SMEs. Many experimental studies show a crowding-out effect of FDI on SME operating investments at the host location (Avci & Akin, 2020).

The results show that the more concentrated equity capital is, the more limited firms are involved in innovative activities. This evidence supports the theory of the negative effects of equity concentration on firm's innovation activities found in previous studies (Edmans, 2014; Chen et al., 2011; Carney & Gedajlovic, 2002; Shleifer & Vishny, 1997). The results in this section are similar to those found in the study of Rossi and Cebula (2015), Minetti et al. (2015), and Rapp and Udoieva (2017), Nguyen et al. (2021). However, the economic mechanisms behind this relationship have not been fully elucidated. The following sections will clarify the reasons behind this relationship by analyzing two channels: access to capital and risk aversion.

**Access to capital channel**

The ownership concentration negatively impacts creativity activities by "accessing to finance channel". To clarify, enterprises paying attention to ownership concentration could face financial resource troubles resulting from financial dependence on major shareholders. This dependency makes it difficult for resources to carry out R&D projects. Therefore, the negative impact of ownership concentration on innovation activities will be more specific for enterprises facing difficulties/barriers in accessing external finance.

Next, to verify the capital access channel, the authors divide enterprises into 2 groups:

- (a) Enterprises with high access to the finance channel
- (b) Enterprises with limited access to the finance channel

**Table 4. The relationship between CON\_CAP and the control variables for SMEs' creativity in accessing the finance.**

Dependent variable: INV				
	Model 4		Model 5	
	Coefficient	Probability	Coefficient	Probability
CON_CAP	-0.58	76.80%	-2.6726*	93.00%
<b>Firm characteristics</b>				
EDU	0.5851	73.60%	-0.2707	60.00%
AGE	0.2632	87.20%	-0.7891*	91.20%
SIZE	0.0881	82.60%	0.8420***	100.00%
LOCA	-0.0992	60.40%	1.3733**	98.80%
WEB	0.4362*	92.80%	0.9276*	92.40%
EXP	0.2299	75.20%	1.699***	99.60%
AUDIT	0.2606	62.20%	1.8648*	92.40%
<b>Province characteristics</b>				
PCI	18.4667***	100.00%	-1.8324	81.00%
FDI	-1.1897***	100.00%	-0.3961	76.00%
Acceptance rate		0.2559		0.2608
Efficiency min		0.0462		0.0327
Observations		271		84

**Note:** Symbols (\*\*\*), (\*\*), (\*) indicate statistical significance levels of 1%, 5%, 10%, respectively. Source: the authors' calculations.

Table 4 shows the relationship between CON\_CAP and the control variables for SMEs' creativity of firms with high access to finance (model 4) and SMEs with limited access to finance (model 5). As expected, the regression coefficient of the variable CON\_CAP is negative, and the probability of impact is up to 93%. In contrast, the negative effects of CON\_CAP on the INV of SMEs without barriers to capital are not apparent when its impact probability is only 76.8%.

**Risk aversion channel**

According to He and Tian (2020), innovation activity is a long process with hidden risks and is affected by related parties' behaviors, including shareholders (investors). Despite a worthy use of time and financial resources, innovative ideas are often with a low probability (Holmstrom, 1989). Therefore, major shareholders with less diversified investment portfolios and assets associated with the success or failure of SMEs may not be able to bear the risks when investing in innovative activities. The authors hypothesize that the negative effect of ownership concentration will be clearer for SMEs whose managers have a high degree of risk aversion.

To verify the "risk aversion", the authors divide the research sample into 2 groups:

(c) Manager's group with low-risk aversion (high risk-loving)

(d) Manager's group with high-risk aversion (low risk-loving)

**Table 5. The influence of concentrated ownership on innovation by risk-averse.**

<b>Biến phụ thuộc: INV</b>				
	<b>Model 6</b>		<b>Model 7</b>	
	<b>Coefficient</b>	<b>Probability</b>	<b>Coefficient</b>	<b>Probability</b>
CON_CAP	0.2378	58.00%	-2.0796**	97.60%
<b>Firm characteristics</b>				
EDU	1.688	89.80%	2.0633*	94.60%
AGE	-0.0897	60.20%	0.3477	87.00%
SIZE	0.3575	89.80%	0.1287	86.60%
LOCA	0.1215	62.20%	0.261	73.00%
WEB	0.9078***	98.60%	0.2471	75.00%
EXP	-0.3403	75.40%	0.7992**	96.40%
AUDIT	-0.1797	60.00%	1.3190*	91.00%
<b>Province characteristics</b>				
PCI	0.3395	60.80%	39.4813***	100%
FDI	-0.1627	67.80%	-1.9753***	100%
Acceptance rate		0.2569		0.2065
Efficiency min		0.022		0.0114
Observations		153		202

**Note:** Symbols (\*\*\*), (\*\*), (\*) indicate statistical significance levels of 1%, 5%, 10%, respectively. Source: the authors' calculations.

Model 6 shows the relationship between ownership concentration, control variables, and creative capacity of SMEs with low-risk aversion managers, while model 7 is the case of managers with high-risk aversion. As expected, the negative impact of CON\_CAP on INV only exists in model 7 (SME has a risk-averse manager).

## Conclusion

This study aims to evaluate the impact of ownership concentration on the creative capacity of SMEs in Vietnam. Most previous studies measured the innovation

activities of large enterprises based on the quantity and quality of patents, but this study uses whether or not new product launches new processes to measure innovation activity (Qi & Ongena, 2020; Bhattacharya & Bloch, 2004) in SMEs. The results of Bayesian regression show that ownership concentration negatively affects the creative capacity of SMEs is certain when the probability of its impact is more than 90%. The results of this study are consistent with the studies of Nguyen et al. (2021), Rapp and Udoieva (2017), Minetti et al. (2015) and Rossie and Cebula (2015). In addition, the study also analyzes the mechanism of this relationship. Specifically, the analysis results show that ownership concentration has a negative impact on SMEs that face many difficulties in accessing finance and those with high-risk aversion.

The results also give some paramount importance to management implications as follows. Firstly, the findings of this paper support the financing theory (Beck & Demircuc, 2006), which emphasizes the integral role of financing for SMEs. Expanding access to capital will limit the negative impact of equity concentration on innovation. The results provide useful information for policymakers in implementing appropriate regulations that increase financial inclusion, such as promoting competition in the banking field (Love & Martínez Pería, 2015; Beck et al., 2006) or improving the problem of private credit and public credit (Jappelli & Pagano, 2002). Secondly, Bayesian results show that SMEs with audited financial statements have clear creative capacity. The results highlight the role of information transparency and the capacity of managers to limit information asymmetry as well as conflicts of interest between major shareholders and small shareholders. Therefore, regulations and policies should be introduced to promote the quality of financial statements and information disclosure, similar to that proposed by Healy and Palepu (2001). In addition, this study also confirms that if provinces make efforts to improve their competitiveness, it will create conditions for enterprises to enhance their operational efficiency, including innovation activities.

Finally, the results also show that FDI inflows tend to create a crowding-out effect on the activities of SMEs to attract FDI. Many provinces in Vietnam have offered many tax and land incentives for businesses, which unintentionally creates unfairness for domestic enterprises. Therefore, Vietnam needs to re-screen the incentives for foreign companies to avoid unfairness between different businesses.

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### WPLYW KONCENTRACJI WŁASNOŚCI NA INNOWACYJNOŚĆ MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW

**Streszczenie:** Badanie przeprowadzono w celu oceny wpływu koncentracji własności na innowacyjność małych i średnich przedsiębiorstw (MŚP) w Wietnamie. Ponadto innowacyjność postrzegana jest jako ważny element tworzenia konkurencyjności w celu osiągnięcia długoterminowego rozwoju firmy. Ten temat został poruszony w wielu poprzednich badaniach, w których innowacyjność jest często mierzona liczbą patentów. Jednak badanie to mierzy innowacyjność MŚP poprzez to, czy te firmy wprowadzają produkty/usługi lub wprowadzają nowy proces produkcyjny lub nową technologię w ciągu 3 lat. Wyniki badań metodą regresji Logit Bayes pokazują, że koncentracja własności szkodzi innowacyjności MŚP w Wietnamie. Autorzy wyjaśniają ten wynik kanałami, takimi jak „dostęp do kapitału” i „niechęć do ryzyka”.

**Słowa kluczowe:** koncentracja własności, innowacje, MŚP, BIZ i Bayes.

### 股权集中度对中小企业创新的影响

**摘要:** 本研究旨在评估所有权集中度对越南中小企业 (SMEs) 创新的影响。此外, 创新被视为创造竞争力以实现公司长期发展的重要因素。这个话题在之前的许多研究中都有报道, 其中创新通常通过专利数量来衡量。然而, 本研究通过这些企业在 3 年内是否引入产品/服务或引入新的生产工艺或新技术来衡量中小企业的创新。通过 Logit Bayes 回归方法, 研究结果表明, 所有权集中损害越南中小企业的创新。作者通过“获取资本”和“风险规避”等渠道解释了这一结果

**关键词:** 所有权集中度、创新、中小企业、外国直接投资和贝叶斯