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STATE OWNERSHIP AND FIRM INNOVATION? EVIDENCE FROM AN EMERGING MARKET

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The Vietnamese government has long recognized the essential importance of innovation in fostering sustainable competitive advantage and economic growth. While transitional countries have experienced limited research on SOEs and firm innovation, our research makes an initial effort to examine the impact of state ownership on innovation in Vietnam's emerging market using extensive panel data of firms listed on the Ho Chi Minh Stock Exchange from 2007 to 2016. The study integrates the institutional view, which regards that SOEs' political and financial favoritism would connect firms to overcome constraints; and agency theory, which holds that SOEs would be less efficient in leveraging these critical resources in pursuing innovative projects. Our study demonstrates that innovation practices occur less often with the increased government involvement in a corporate structure. Our findings are attributable to the inherent problems of state-owned firms and suggest implications for managers and policymakers regarding the benefits and costs of state ownership in fostering innovation in the context of the socialist-oriented market economy of Vietnam.

Keywords: State Ownership, Innovation Investment, Emerging Market, Vietnam
JEL Classification: O31, H70

1. INTRODUCTION

Corporate innovation performance capability is represented by efficient and effective engagement in innovative practices to generate competitive advantages (Shipton et al., 2005). Corporate innovation has been validated as the outstanding driver in formulating a firm's economic development potential and prospects (Jiang and Yuan, 2018). Consistently, with the rise of emerging countries as the global economic hub, innovation investment is essential to their economic prosperity and sustainable growth (Wang et al.,

2019).

The economic structural reform over the last 20 years remains essential for the middle growth potential of the Vietnamese economy. To create breakthroughs in economic growth and bring Vietnam out of the middle-income trap, natural resources and low-cost labor are no longer the driving force but the increased innovation and technology investment. The Vietnamese government has long recognized the essential importance of innovation since it has implemented a variety of programs to encourage technology and industry innovation.

There is a growing interest in how innovation development is influenced by factors unique to emerging market economies (Chen et al., 2014a). Moreover, empirical evidence regarding the relationships between innovation activities and firm characteristics is scarce despite the essential role of innovation investment in fostering sustainable competitive advantage and national economic growth. Nguyen et al. (2008) conducted the earliest research in Vietnam, demonstrating that innovation enhances firms' export efforts, using a cross-sectional sample of 2000 private enterprises in 2005. Similarly, Tuan et al. (2016) discovered that innovation in processes, marketing, and organization positively affected firms' performance in Hanoi, Vietnam. However, the two studies exploited cross-sectional data and a static model hence overlooking unobserved factors. In addition, studies by Nguyen et al. (2008), Phan and Kocaoglu (2014) and Doan and Vu (2016) revealed determinants of innovation activities, employing surveys of SMEs in Vietnam. In detail, SMEs tend to make few and infrequent attempts at innovation due in part to a lack of awareness and information about innovation and SMEs' insufficient internal capabilities (Phan and Kocaoglu, 2014).

The resource-based view (RBV) highlights the number of resources deployed by the companies to produce a substantial competitive advantage (Barney, 1991; Barney, 1986) and the characteristics of these resources (Bicen and Johnson, 2015). As explained by the RBV, Wang et al. (2010) emphasized critical resources as the antecedents of innovation success, in which government support plays a notable role in shaping innovation performance in emerging economies. Remarkably, the involvement of the government in firm ownership structure is noteworthy in emerging economies. State-owned enterprises (SOEs) are of critical significance to national economic development where they account for more than 10% of global GDP (Capalbo et al., 2018), and even more so in developing countries. Official estimates specify a proportion of about 30% of Vietnam's GDP accounted for SOEs in 2015 (OECD, 2020).

On the one hand, the emerging government, particularly in Vietnam, retains control over critical resources while playing an essential role in the institutional environment and exerting influence on the majority of economic players in the country. Hence firms with state ownership may be able to utilize their political connections and financial privileges to get an advantageous position in innovative investments (Chaney et al., 2011). The most often stated favoritism examples are the ease of access to funding, land use rights, the guarantee for insolvency debts, and other direct subsidies from state

budgets (van Thang and Freeman, 2009). This evidence of unequal treatment of the public and non-public sectors has an impact on corporate operational activities, especially innovative performance (Zhou et al., 2017; Song et al., 2016). On the other hand, SOEs are often subjected to excessive interference and a lack of independence required to undertake business activities (Fan et al., 2007) since the government exercises its broad supervisory control over the process of placement and displacement of management boards (Chan and Rosenbloom, 2010). Consequently, SOEs should be less innovatively efficient. They have also reoriented corporate objectives and operations, distinguishing them from governance principles (Abramov et al., 2017). Particularly, SOEs target socio-political goals rather than pursuing economic gain and thus are less market-oriented (Choi et al., 2012; Uddin, 2016). In addition, agency conflicts of interest arise as a result of the disagreement between profitability and stability, while state-owned firms are regulated to guarantee stability rather than to enhance profitability (Nguyen et al., 2020). The preceding arguments pose an intriguing question about whether firms with governmental commitment spend more on innovative activities.

The research contributes to the existing literature in two aspects. First, the majority of the current research focuses on the behavior of SOEs in developed markets, with just a few studies performed in emerging markets (Khaw et al., 2016). While Vietnam provides an ideal setting to investigate the connection between state ownership and firm innovation for the distinctive features of a socialist-oriented market and where SOEs have obtained powerful government support, there has been little attention towards this association in emerging economies, especially Vietnam. The studies of Nguyen et al. (2013), Phung and Mishra (2016), Quang and Xin (2014) primarily investigate the connection between state ownership and firm performance. As a result, the primary aim of this project will be to close this research gap. This study, therefore, adds to the current literature on the analysis of the innovation investment and role of SOEs in Vietnam, a transitional economy where state-owned corporations remain dominant, thus enriching studies of state ownership. This contribution is essential in the context of a transition economy, often characterized by weak institutions and uncertainties.

Second, previous research provides ambiguous evidence as to whether state ownership encourages or discourages firm innovativeness. On the one hand, some studies have argued that state ownership hurts firms' innovation. Notably, Guan et al. (2009) concluded that SOEs are less motivated to conduct innovative projects, considering that they receive financial and political privileges from the government but do not efficiently and effectively utilize these resources. Similarly, state-owned firms with high state concentration are less likely to invest in risky innovative projects and are associated with low R&D investment (Jefferson et al., 2003). They measured SOEs' innovativeness by the firm's output of new product sales and patent applications. Equivalently, enterprises controlled by the local government are the primary drivers of R&D activity and innovation (Teng and Yi, 2017). Compared to privately held enterprises, state-controlled firms had a lower commitment to innovativeness, including being less likely to develop new goods and new technologies and conduct new joint

ventures and license agreements (Ayyagari et al., 2011). On the other hand, numerous studies have indicated an opposite direction, a positive relationship between the two. Choi et al. (2011) proposed a lagged effect of state ownership on innovation in an underdeveloped market context, reasoning that state involvement enhances access to funding and firmly secures firms in a destructible institutional framework. Likewise, Mahmood and Rufin (2005) and Xu and Zhang (2008) presented a positively significant relationship between firms with state shares and process innovation, describing that process innovation facilitates higher economic performance compared to product innovation. Moreover, Zhou et al. (2017) indicated an inverted U-shaped interaction between state ownership and innovation, in which firms with a small state ownership percentage tend to be the most inventive, whereas those with a majority of state control are less innovative. They clarified the outweighed effect of favorable treatment received by the government to the inefficient use of these privileges caused by agency problems in firms with minority state control. Contradictory, though significant-owned SOEs obtain favoritism in finance and regulations, they are subjected to greater inefficient resource management and tend to exhibit lower innovativeness. Choi et al. (2012) found that government involvement in corporate structure had no discernible influence on Korean firms' technological innovation performance. To sum up, this study aims to resolve the empirical inconsistencies about the effects of state ownership on innovation capability, targeting the Vietnamese transitional economy.

This study follows the resource-based view (RBV) logic to control for the effect of state ownership on firms' innovation capability, explained by its influence on resource allocation and utilization processes. The RBV highlighted several resources deployed by the companies to produce a substantial competitive advantage (Barney, 1991; Barney, 1986). However, under different scenarios, a contingency view proposes that different types of organizations capture distinct values from different resources when elevating their competitive edges and innovation (Wang et al., 2019). Remarkably, the organizational context by Chen et al. (2012), the strategic intention by Chen et al. (2014b) and the market environment by Sirmon et al. (2007) constitute the distinctness of these scenarios. The study, therefore, highlights the influence of state ownership, a salient institutional actor, considering that Lee and Zhou (2012) emphasized a unique organizational context of firms with significant government control (e.g., SOEs) whose strategic orientation is essentially different compared to non-SOEs.

The remainder of this paper is structured as follows. Sections 2 and 3 review the institutional background of Vietnamese enterprises and the Literature background. Section 4 introduces data and research methodology. Section 5 presents our empirical results and Section 6 highlights our discussion and conclusions.

2. INSTITUTIONAL BACKGROUND

United Nations Conference on Trade and Development (UNCTAD) reported that

technological innovation is fundamental for all nations' sustainable development, particularly developing nations (UNCTAD, 2021). Simultaneously, UNCTAD urges all developing economies to equip themselves in an era when technological advancement will profoundly affect their markets and society. As a result, emerging countries, particularly low-income nations, cannot disregard the wave of technological transformation.

The World Bank (2021) underscored the necessity of innovation-driven growth among Vietnamese firms. First, after more than 30 years of Doi Moi, Vietnam has relocated its workforce away from agriculture to other sectors. Productivity has stagnated and diminished. However, the space to increase productivity based on capital and labor is no longer available. Consequently, productivity can only be increased through science, technology, and innovation. Second, the application of high technology and the promotion of innovation along with the Industrial Revolution 4.0 provide an opportunity to improve the productivity and flexible adaptability of Vietnamese enterprises in the context of the crisis. Third, by 2035, Vietnam intends to be a member of the upper-middle-income country groups. Currently, Vietnam is undergoing a new period of economic transition, confronted with the problems of decreasing global economic growth and trade, rapid technological development, as well as economic hardships caused by the COVID-19 epidemic. As a result, it is critical to prioritize innovation in the national development agenda.

According to Resolution No.52-NQ/TW, the Vietnamese government affirms that innovation is considered the goal of millennium development growth by 2030. It simultaneously emphasizes the critical role of innovation in promoting economic development, thereby affirming the need to "strongly and comprehensively reform in both scale and intensity in all fields".

To enhance the investment in Science and Technology capability and qualifications, the State of Vietnam has demonstrated its efforts via the completion and amendment of management mechanisms and legislative frameworks. The study mentions some notable policies. First, Resolution No.52-NQ/TW emphasizes "research and application of science and technology to strengthen innovative capacity for the development of Industry 4.0" as one of the critical tasks. Second, the project to "develop large-scale state-owned enterprises, especially multi-owned state economic groups to promote the leading role for other economic sectors" is entrusted to the Ministry of Planning and Investment. Third, the stipulates investment incentives, including incentives on corporate tax, import tax and land tax, for high-tech industries and science and technology enterprises. Specifically, enterprises implementing new investment projects in the fields of scientific research and high-tech applications would enjoy a preferential tax rate of 10% for 15 years. In addition, import tax will be exempted for goods imported to create fixed assets, raw materials, supplies, and components for the implementation of investment projects. Furthermore, enterprises in this industry group are subjected to the exemption and reduction of land rent, land use levy and land use tax.

Despite policy efforts, spending on R&D by the Vietnamese government and

business sectors has climbed 8 times between 2011 and 2017, however it is only 0.4% of GDP, lower than Malaysia, Thailand, and OECD average of 1.6% (OECD, 2021). According to the Global Innovation Index 2021, Vietnam is currently placed fourth in the ASEAN region (WIPO, 2021). However, when examining each assessment criterion separately, particularly the set of indicators on Institutions (including the political environment, regulatory environment, and business environment), Vietnam's ranking remains a significant gap compared to other countries in the ASEAN region. Vietnam's Institutions index, in particular, ranks 83rd, much lower compared to Singapore (1st), Malaysia (41st), and Thailand (64th). This analysis demonstrates that, while the Vietnamese government has made attempts to amend the legal and policy environment to encourage enterprise innovation, there is still a wide gap between policy and reality, which needs to be considered.

In short, Vietnam is in the early stages of development based on efficiency, not innovation (Schwab, 2018). On the other hand, Vietnamese firms need sufficient time since they are in the initial phase of growth, mainly focusing on processing and assembling. Consequently, there is still plenty of space to encourage local enterprises to innovate and invest heavily in engineering and technology to create greater added value (Schwab, 2018).

3. LITERATURE REVIEW

3.1. State Ownership and Firm Innovation

The proportion of a firm's ownership share held by the government is mentioned as state ownership, and state-owned enterprises (SOEs) are businesses with the majority government commitment (Boisot and Child, 2013). The Vietnamese Law on Enterprise (LOE) 2020 has expanded the classification of SOEs and separated them into two categories depending on the proportion of state ownership. According to the LOE 2020, SOEs are defined as enterprises with 100% charter capital owned by the State (as defined in the Law on Enterprises 2014) and enterprises with more than 50% (but less than 100%) charter capital/voting rights granted by the state. Corporate governance regulations will be implemented separately for each group of SOEs to guarantee the effective management of State-owned capital in these SOEs.

The drivers of productivity at the micro level have been the focus of empirical research based on theories of endogenous growth (Lucas, 1988; Romer, 1986) that emphasize technical innovation outputs (such as product and process innovations) and innovation activities (such as R&D). In most studies, researchers have focused on one-way causal relationships between innovation and economic success (Crepon et al., 1998). Different models and approaches have shown that technological innovation has a favorable influence on company productivity, including studies by Aboal and Garda (2015), Chudnovsky et al. (2006), Goedhuys et al. (2008), Miguel Benavente (2006).

The ownership of an enterprise is crucial to its operations, and it has been identified as a critical institutional component in emerging markets (Lee et al., 2015; Liu et al., 2017). Regarding the firm's management practices, different types of shareholders with different social identities are diverse in their investment preferences, strategic goals, and governance practices. As a result, the allocation and utilization of specific resources vary systematically among companies with various ownership structures and then shape the efficiency of their innovation activities (Xia and Walker, 2015). In the Vietnamese market, ownership types here are specified as state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), including domestic private investors and foreign investors. In the following, we develop hypotheses regarding how resource allocation and resource utilization contribute to innovation capability between SOEs and non-SOEs in the Vietnamese market. State ownership is considered to affect firm innovation from two different and competing perspectives, namely resource allocation and resource utilization.

3.2. The Resource-Based View

The resource-based view's foundation revolves around the company's competitive advantage and points to the heterogeneity in resource possession among organizations as the cause of the disparity in operating performance (Barney, 1986). Ultimately, competitive advantage is derived from a firm's ability to collect valuable, unique, and difficult-to-replicate resources (Barney, 1991; Day, 2011). Research shows that capabilities, the accumulated skills that allow organizations to manage and deploy resources, are the most important driver of long-term competitive advantage (Day, 2011; Morgan et al., 2012; Teece et al., 1997). More specifically, not all acquired resources communicate a substantial competitive advantage (Clulow et al., 2007), but the capability to leverage these resources internally plays an equally important role (Lowe and Teece, 2001). In light of this argument, resources that are first allocated, and accessed in the most natural form, might subsequently be able to be deployed and leveraged strategically by firms to achieve distinctiveness (Mathews, 2006). Equivalently, Day (2011), Zhou et al. (2017) justify firms' performance in innovation practices through two schemes of resource allocation and resource utilization. Firm capabilities are indeed challenging to replicate, ensuring a long-term competitive advantage for businesses (Day, 2011).

3.2.1. The Institutional Theory and the Relationship between State Ownership and Innovation Explained by the Resource Allocation Mechanism

Being widely used in organizational studies (Greenwood et al., 2008), the institutional theory emphasizes the conformity of an organization with the exterior institutional environment, including standards, procedures, rules, and policies (Scott, 1995). As a unique feature of the emerging institutional environment, institutional voids

evolve from the uncertain and weakened operation in institutions (Khanna and Palepu, 1997; Park et al., 2006), and create an unstable environment for business and innovation activities. These severe consequences include a lack of capital resources, reduction of experienced and skilled labor (Hoskisson et al., 2000), fragmented and inadequate legal and regulatory systems, restricted access to crucial business knowledge (Bruton et al., 2010; Nguyen and Pham, 2020), etc. Xu et al. (2014) propose solutions to these institutional voids through government intervention via its laws and regulations enforcement process.

Firstly, in emerging economies, the government characterizes a crucial role in shaping the institutional environment in which it regulates critical resources (Lu et al., 2010) and shields particular business players from the competition using national strategic planning and regulations (Hoskisson et al., 2000; Sun and Liu, 2014). For example, only state-owned enterprises are permitted to participate in strategically essential industries (Lazzarini et al., 2015), such as power systems, telecommunications, aviation, and railways sectors, in the Vietnamese emerging market (OECD, 2018). It might be thus unfeasible for private players to compete on equal terms if the state has a significant stake in important network businesses.

Since the growing risks and costs associated with innovation activities pose a severe constraint on business strategies, the regulatory authority would commend an advantageous and healthy environment in which firms possibly will enjoy preferential tax rates and easier access to investment and financing (OECD, 2015). Moreover, Hue (2019) regards the necessity of substantial resources in exhibiting innovative efforts, as firms, particularly in developing nations, confront financial obstacles or constraints in their innovation operations. In Vietnam, SOEs benefit from a plethora of incentives including privileged access to funding and loan guarantees, land use entitlements, competitive advantage in public procurement, improved information access, and direct government budget subsidies van Thang and Freeman (2009) that are not available to private-owned enterprises. Since then, state involvement in corporate structure has proposed a beneficial influence on firms' desire to innovate that would connect firms to overcome institutional voids with favorable treatments and greater resources for innovative endeavors.

Secondly, as an opportunity to make a breakthrough in national socio-economic development, the Vietnamese government emphasizes the strategic importance of actively participating in the Fourth Industrial Revolution and creating favorable conditions for innovation. Throughout, the Vietnamese government has consistently fostered innovation, perceiving it as one of the most effective instruments in the country's sustainable development strategy. Additionally, in their roles as industry leaders, state-owned firms are tasked with building value chains and encouraging innovation in their particular sectors by enlisting the engagement of businesses from a variety of economic sectors and components. According to institutional theory, the institutional environment (e.g., government agencies) places considerable pressure on organizations to exhibit their strategic goals and outcomes (Zhou et al., 2017). As a

result, state-owned businesses are subject to significant regulatory pressure to comply with these obligations and respond to the call of stimulating innovation efforts.

3.2.2. The Agency Theory and the Relationship between State Ownership and Innovation Explained by the Resource Utilization Mechanism

In emerging countries, where the state contributes major stakes in corporate structure and investors' rights are less protected, the agency problem has been a source of contention (Vo, 2018). In terms of the agency problem, SOEs may suffer a heavier burden than private entities since they face a severe "twin agency" problem (He and Wang, 2009). SOEs, in particular, often encounter conventional agency problems stemming from the incompatibility of interests between management and all shareholders, and also objective conflicts between the government (typically as a majority shareholder) and minority shareholders (Dharwadkar et al., 2000).

Furthermore, the common ownership structure of SOEs is a plausible explanation for the emergence of agency problems (Gong and Choi, 2021). Due to the pyramidal ownership structure, majority owners possess a dominating influence over the firm, which aggravates the minority shareholders' interests. In contrast to SOEs that are solely controlled by the state, non-state shareholders benefit more from marketization since they gain more incentives to fix the illogical structure of internal management systems, which results in accelerating firm innovation (Gong and Choi, 2021).

Considering emerging economies, public officials, acting as principals, may exercise their appointment authority toward organizations' management boards for state-oriented considerations rather than for managers' expertise and competence (Qian, 1996). The government thus exercises its broad supervisory control over the process of placement and displacement procedures of key management (Chan and Rosenbloom, 2010), and consequently holds managers accountable (Arsen and Mason, 2013). As a result, citizens own SOEs and SOEs are governed and controlled under a regulatory authority in which hierarchy and strict bureaucracy are highlighted (Ngo et al., 2008). In this sense, SOEs are perceived as inefficient in managing and leveraging resources to achieve innovative objectives. Consequently, the conflict of interest between shareholders and agents is considerable to SOEs.

Firstly, SOEs target socio-political goals, including lower unemployment rate, social security, and increased source of public revenue through corporate taxes and dividends, rather than pursuing economic gain and thus being less market-oriented (Choi et al., 2012; Uddin, 2016). Additionally, Vietnamese non-state owners have expressed concern about the state's continuous use of listed SOEs for public policy initiatives and they should have been adequately notified about non-commercial objectives at the point of their commitment (OECD, 2015, 2020). SOE managers, as appointed by the state, are therefore not driven to pursue increased profit, better investment opportunities and a sounder operating strategy but advance social, and political objectives and boost corporate brand equity (Nguyen et al., 2020). Consequently, socio-political goals partly

distract the emphasis of SOEs' resource utilization on profit maximization, including innovation and enhancing business competitiveness which requires the cooperation and a great deal of effort of many people and cross□functional units (Brettel and Cleven, 2011).

Secondly, agency conflicts of interest arise as a result of the disagreement between profitability and stability while state-owned firms are regulated to guarantee stability rather than to enhance profitability (Nguyen et al., 2020). Since the innovation process is a trial-and-error approach with little probability of success (Leiponen and Helfat, 2010), SOE agents have less motivation to maximize market prosperity, whereas prefer to take the necessary precautions to secure their positions and advantages. Prior research suggests that a reduction in business risk sentiment is caused by an increase in state ownership (Boubakri et al., 2013; Khaw et al., 2016; Nguyen et al., 2020; Vo, 2018). Since innovation demands extremely unpredictable and complicated procedures, SOE agents have less desire to perform innovative practices (Jia et al., 2019).

4. RESEARCH METHODOLOGY

4.1. Data Sample

The sample data includes 281 firms listed on the Ho Chi Minh Stock Exchange (HOSE) from 2007 to 2016, creating 2889 observations. Considering the period of 2007-2016, as the process of equitization moves forward, the government's stake in state-owned corporations is changing significantly. As a result, this sample is both relevant and credible for examining the link between state ownership and innovation. There are more observations for certain firms than others in this imbalanced panel data set because of the availability of data, listing time, and our endeavor to maximize the sample size.

4.2. Measurement of Variables

4.2.1. Innovation Investment (INNO)

Remarkably, the origins of innovation lie in a firm's ability to acquire and manage knowledge, which is called "absorptive capacity" (Cohen and Levinthal, 1989). In other words, knowledge is the most critical production input and determines innovation propensity and intensity. In addition, intangible assets are knowledge-based assets (Andriessen, 2004). Concurrently, Ferracane and van der Marel (2020) stated that using intangible assets, such as patents and goodwill, for performing innovation (in Malaysia and China) and developing innovations as a result of research and development that are new to the market (in Vietnam). While the role of Intangible Assets is recognized as central to sustaining the competitiveness of firms and innovation systems, they are

increasingly seen as critical drivers for knowledge creation, innovation and consequently economic growth (Kramer et al., 2011).

According to the literature on firm innovation, R&D expenses normally take into account firm innovation. Xiaosheng et al. (2020) document that the information on intangible assets mainly concerns patents, non-patent know-how, property rights, etc., the changes in the firm's intangible assets reveal the changes in the firm's innovation activities related to patents, non-patent know-how, and property rights, etc. While firms listed on the Ho Chi Minh City stock exchange do not report their R&D expenditures, the study, therefore, follows Xiaosheng et al. (2020) and defines firm innovation investment as the net changes in intangible assets between year t and year $t-1$, divided by the total asset of year t.

4.2.2. State Ownership (STATE)

We measured state ownership in two ways. First, we treated it as a continuous variable and measured the percentage of shares held by the state to the total outstanding shares. Second, we created a Minority Dummy variable to indicate whether a firm is a minority state-owned firm (with a stake exceeding 10% of voting shares) and an SOE Dummy to indicate whether a firm is a majority state-owned (with a stake exceeding 50% up to 100% of voting shares) or wholly state-owned company. Minority Dummy takes a value of 1 for a minority state-owned firm and a value of 0 otherwise. SOE Dummy takes a value of 1 for a majority state-owned or wholly state-owned company and a value of 0 otherwise. We use 2 dummies to confirm the results since using only a normal rate of 50% of state ownership to split our sample might lead to a huge unequal subset of data.

4.2.3. Institutional development (PCI)

Economic institutions in Vietnam are measured by the Provincial Competitiveness Index (PCI) on Vietnam's business environment, conducted annually by the Vietnam Chamber of Commerce and Industry (VCCI) (Tran et al., 2008). PCI was introduced in 2005, and since 2006 PCI has been calculated for 63 provinces and cities with 10 sub-indices, including entry costs for business start-ups, access to land security, transparency and access to information, time requirements for bureaucratic procedures and inspections, informal charges, state-sector bias, proactiveness and creativeness of provincial leadership, business support services, labor training and legal procedures for dispute resolution. The study collects data from pcivietnam.vn

4.2.4. Industrial Competition (HHI)

We used the Herfindahl-Hirschman Index (HHI) to measure industrial competition (one minus industry concentration). We calculated the Herfindahl index by GICS

Industry Classification, using the sales revenue to calculate the market share of each firm within each industry. The Herfindahl-Hirschman Index (HHI) is used to determine whether a market's competition is perfect or highly monopolistic. The concentration stat has a value from 0% to 100%. The higher this index, the greater the concentration of the market, and the market power will be concentrated in this industry group.

$$HHI = s_1^2 + s_2^2 + s_3^2 + \cdots + s_n^2, \quad (1)$$

where s_n is the market share of the n^{th} firm in an industry and n is the number of firms in the same industry.

4.2.5. Other Control Variables

To be consistent with the literature, this paper employs several control variables that have been applied in various prior studies (Chen et al., 2014a; Choi et al., 2011; Lodh et al., 2014; Zhou et al., 2017), including Firm size (SIZE), Leverage (LEV), Fixed Asset (FIXED), Return on Equity (ROE), Operating Cash Flow (OCF). In addition, the study follows Zhou et al. (2017) to include the Industry Growth Rate (INDGR) defined as the growth of aggregated annual sales of all firms operating in the same industry, to control industry heterogeneity.

4.3. Regression Model

To examine whether ownership structure affects the innovation of firms listed on the Ho Chi Minh Stock Exchange, this paper employs an innovation investment equation as follows:

$$INNO_{i,t} = \beta_1 + \beta_2 STATE_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 FIXED_{i,t} + \beta_6 ROE_{i,t} + \beta_7 OCF_{i,t} + \beta_8 PCI_{i,t} + \beta_9 HHI_{i,t} + \beta_{10} INDGR_{i,t} + \varepsilon_{i,t}. \quad (2)$$

4.4. Estimation Methods

We utilize several linear regression estimation methods for panel data. Given the nature of our data set which has large cross-sections and short periods, an appropriate choice of panel data estimators is important. Specifically, we opt to use the POLS and random effects panel estimators for more robust results.

Similar to previous papers employing corporate finance data in the context of Vietnam, random effects estimators seem to be a natural choice for our data set. However, we further reinforce our priory by employing the Hausman tests for the preference of fixed and random effects estimation. Accordingly, the Hausman tests highlight the preference for random effects estimators.

Table 1. Descriptive Characteristics

Code	Measurement	Obs	Mean	St.Dev	Min	Max
INNO	(Intangible Asset at t - Intangible Asset at t -1)/Total Asset at t	2,483	0.00	0.03	-0.32	0.79
STATE	Continuos and 2 dummies	2,869	9.89	19.92	0.00	96.72
SIZE	The logarithm of total assets	2,784	27.12	3.77	0.00	32.82
FIXED	Fixed assets/total assets	2,736	0.27	0.22	0.00	0.97
LEV	Total debt/ Total asset	2,736	0.25	0.19	0.00	0.92
OCF	Operating Cash Flow/Total Asset	2,736	0.04	0.13	-0.99	0.95
ROE	Net Income/Shareholders Equity	2,733	0.13	0.17	-1.88	0.98
INDGR	(Industry sales at t – Industry sales at t-1)/ Industry sales at t-1	2,581	0.22	0.31	-0.93	6.94
PCI		2,889	60.62	3.96	37.96	77.22
HHI		2,889	0.25	0.21	0.00	1.00

Table 2. Correlations

	INNO	STATE	ROE	LEV	OCF	FIXED	SIZE	INDGR	PCI	HHI
INNO	1									
STATE	-0.04	1								
ROE	-0.02	0.06	1							
LEV	0.02	-0.02	-0.19	1						
OCF	0.03	0.11	0.19	-0.2	1					
FIXED	0.11	0.08	-0.03	0.23	0.23	1				
SIZE	-0.02	0.07	-0.02	0.34	0.02	0.01	1			
INDGR	0.03	-0.08	0.06	-0.08	-0.11	-0.06	-0.06	1		
PCI	0.00	0.08	0.02	-0.00	0.02	0.01	0.01	0.01	1	
HHI	-0.01	0.01	-0.06	-0.04	0.00	0.09	0.00	0.09	-0.02	1

Table 3. Impact of State Ownership on Innovation

Variable	State share		State dummy			
	Pool OLS	Random Effect	Pool OLS		Random Effect	
Intercept	2.82	2.80	2.62	2.87	2.56	2.93
	(2.04)	(2.12)	(2.04)	(2.03)	(2.12)	(2.09)
STATE	-0.00**	- 0.00**	-	-	-	-
	(0.00)	(0.00)	-	-	-	-
SIZE	-0.09	0.09	-0.09	-0.09	-0.09	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
ROE	-0.25	-0.27	-0.25	-0.24	-0.27	0.25
	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)	(0.06)
LEV	0.21	0.23	0.24	0.23	0.25	0.34
	(0.42)	(0.41)	(0.43)	(0.42)	(0.41)	(0.43)
FIXED	2.25***	2.31***	2.23***	2.23***	2.29***	2.31***
	(0.36)	(0.37)	(0.36)	(0.36)	(0.37)	(0.37)
OCF	0.58	0.61	0.57	0.54	0.63	0.48
	(0.58)	(0.58)	(0.57)	(0.57)	(0.58)	(0.57)
INDGR	0.43*	0.41*	0.41*	0.41*	0.41*	0.38*
	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)
PCI	0.00	0.00	0.00	0.02	0.00	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
HHI	-0.35**	-0.37**	-0.36**	-0.34**	-0.38**	-0.33**
	(0.42)	(0.44)	(0.42)	(0.42)	(0.43)	(0.43)
Minority Dummy		-	-0.36**	-	-0.35**	-
	-	-	(0.16)	-	(0.16)	-
SOE Dummy	-	-	-	-0.34*	-	-0.34*
	-	-	-	(0.23)	-	(0.23)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	2.38%	5.42%	2.41%	2.32%	5.49%	5.88%

Notes: * p < .05; **p < .01; ***p < .001. * Standard errors are in parentheses. Industry and year fixed effects are included and not shown.

5. EMPIRICAL EVIDENCE

Descriptive statistics and variable correlations are shown in Tables 1 and 2, respectively. The negative coefficients between state ownership and innovation initially suggest that the higher the state ownership level, the lower the innovation investment.

Multicollinearity is not significant, as evidenced by the range of the variance of inflation factor (VIF) of 1.02 to 1.31, according to an examination of correlations among these variables (Hair et al., 1998).

Table 3 presents the estimation results, including state ownership evaluated by both continuous and dummy measurements. Regarding Models 1 and 2, the state ownership and innovation exhibit a negative statistically significant at 5% with Pooled OLS and Random Effect. Additionally, coefficients of the Minority and SOE Dummies are all negatively statistically significant at 5% and 1%. Specifically, the results of firms that have a state as a significant minority shareholder are presented in Models 3 and 5, explaining the case in which minority-owned firms are less likely to pursue innovation compared to firms with less than 10% of state commitment. The estimates of firms that have the state as a majority and wholly shareholder are presented in Models 4 and 6, revealing that majority and wholly-owned firms have lower innovation investment compared to firms with less than 50% of state commitment.

These findings are consistent with all models and indicate that state involvement in corporate structure weakens innovation investment among Vietnamese firms. Our study contribution is in line with the previous research, including Guan et al. (2009), Jefferson et al. (2003), Xu and Zhang (2008), Ayyagari et al. (2011), and contradicts Choi et al. (2011), Li and Xia (2008) where state ownership facilitates firms' innovation capability.

In terms of the control variables' effects, fixed asset and industry growth have a positive, significant effect on firms' innovation practices, while other variables of firm size, return on equity, operating cash flow, leverage and PCI have no significant influence on firms' innovation. Moreover, HHI which measures industrial competition is negatively statistically significant at 5%, explaining the case that the higher the value of HHI toward 1, the lower the firms' innovation commitment. Equivalently, our study confirms that firms have less motivation to innovate in the more concentrated industry (e.g., less competitive).

6. DISCUSSION AND CONCLUSIONS

The Vietnamese government has long recognized the essential importance of innovation performance in fostering sustainable competitive advantage and economic growth. Since the majority of the current research focuses on the association of SOEs and firm innovation in developed markets, a limited number of studies have been undertaken in transitional countries. Our study is the first to investigate whether state

ownership flourishes or impedes firms' innovation in Vietnam's emerging market, using rich panel data of listed firm in the Ho Chi Minh Stock Exchange during the period 2007-2016. Our study on the innovation efficiency of SOEs demonstrates that innovation practices occur less often with the increased government involvement in a corporate structure. The findings are attributable to the inherent problems of state-owned firms, including the overlap of operational objectives, weakened governance in terms of the assessment of SOE representatives' performance, the imbalance in resource allocation and utilization, and the lack of competitive pressure.

First, SOEs are not designated to pursue economic gains but to advance socio-political objectives (Choi et al., 2012; Nguyen et al., 2020; Uddin, 2016). SOEs in Vietnam themselves are subject to relatively little competitive pressure and have been dispersed in resources due to the fact that they have to perform socio-political functions, engage in community support activities, and directly contribute to the performance of social security work, in addition to their market-oriented objectives (Knutsen and Khanh, 2020). Dang et al. (2021) argued that SOEs should prioritize the generation of social welfare since emphasizing an evaluation criterion solely on profitability might mislead policymakers. as may mislead policymakers. Throughout the years, large state-owned firms have consistently stressed the importance of community support activities and prioritized social security for their employees and the community. As a part of the state's strategy of development and social justice, they also actively support the community through advocacy programs of social organizations. Consequently, socio-political goals partly distract the emphasis of SOEs' resource utilization on profit maximization, including innovation and enhancing business competitiveness which requires the cooperation and a great deal of effort of many people and cross□functional units (Brettel and Cleven, 2011).

Second, since the innovation process is a trial-and-error approach with little probability of success (Leiponen and Helfat, 2010), SOE agents tend to avoid risks to ensure safe positions, thus reducing innovation incentives (Jia et al., 2019). On the one hand, enterprises are encouraged to pursue innovative projects that are associated with inherent uncertainty. On the other hand, state-owned firms must strictly adhere to the orientation of "not using the state budget", "not violating the law on preserving and increasing the value of state capital in enterprises", and "preventing loss of capital and state assets". It is infeasible to reconcile these two requirements, which are themselves a contradiction. Equivalently, SOEs are less motivated to commit to innovative but risky projects as they would be regarded as causing a loss of capital and state assets. In addition, the tenure of each appointment of the representative of state capital at the enterprise is 5 years. Correspondingly, the assessment of SOE managers takes place once a year, after the performance categorization and annual financial statements have been released, including criteria on the compliance with the law provisions and competent authorities' direction, profit after tax, and the ratio of profit after tax on assigned equity (The Minister, 2020). Given that the creation, testing, and validation phases of most innovation initiatives take a long time (Fernandes and Brandao, 2016),

SOE managers consequently are less motivated to pursue innovative initiatives since they are subjected to a short tenure and a vague performance assessment.

Third, as mentioned in the literature, since the institutional view and the agency theory both offer justifiable discussion, they, therefore, are combined to explain the overall influence of state involvement on innovative efforts. Specifically, the institutional view regards the favoritism of SOEs in critical resource allocation by the government (e.g., the political and financial privileges) that would connect firms to overcome constraints in pursuing innovative projects. In Vietnam, line ministries that are obligated to policy and regulation essentially control SOEs operating in the same sectors themselves (OECD, 2020). Agency theory addressed the inefficiency of SOEs in managing and leveraging resources to achieve innovative objectives, explained by the non-commercial objectives and the balance of profitability and stability of SOEs. Consequently, the level of state involvement in organizational structure may highlight or conceal the institutional view and agency theory. Our findings suggest a decrease in innovation commitment as state involvement increases because the operational efficiency of Vietnamese state-owned firms is still limited and lower than that of private firms in most sectors, not commensurate with the allocated resources (Kim and Nguyen, 2019). Following the 1986 renovation, the pre-tax profit declarations of the majority of the biggest SOEs are attributed to their favorable treatment received by the government rather than operational efficiency (Kim and Nguyen, 2019). They also emphasized the inefficient and ineffective resource management of SOEs which continuously be a source of concern for the Vietnamese economy. Another piece of evidence relating to Vietnam's low investment efficiency is the high level of the ICOR coefficient in Vietnam which assesses the effectiveness of capital investment (Ho et al., 2019).

Finally, SOEs often need additional external influences to implement innovations, such as the diversification of ownership, increased investment in information technology infrastructure, the participation of foreign shareholders, and competition (Girma et al., 2009). Economic theories indicate that the driving force of innovation, or "creative destruction" (Schumpeter, 1942), does not originate from an economic actor (e.g., SOEs). Nevertheless, competition is the motivating factor behind innovation (Kasper and Streit, 1998). Considerably, state-owned enterprises in Vietnam themselves are subject to relatively little competitive pressure since they play a dominant role in a number of important industries and fields that exhibit monopoly and/or oligopoly positions (OECD, 2018). The lack of competition in the marketplaces where SOEs are prominent thus discourages innovation commitment.

Despite the government's efforts in implementing a variety of mechanisms and policies to encourage innovation investment, Vietnam's innovativeness process appears to lag behind other ASEAN countries. Since Vietnam is in the early stages of development based on efficiency but not innovation, there is still plenty of space to encourage local enterprises to innovate and invest heavily in engineering and technology to create greater added value. Our findings are attributable to the inherent problems of state-owned firms and suggest implications for managers and policymakers regarding

the benefits and costs of state ownership in fostering innovation. There would be a need to continue improving the legal framework to create synchronization and unity in restructuring and improving the efficiency of state-owned enterprises. The study thereby extends the literature on SOEs and innovation in the context of the socialist-oriented market economy of Vietnam.

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