



# Social capital and firm performance in transition economies

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## Abstract

The study explores how social capital affects the performance of small- and medium-sized enterprises (SMEs) in a transition economy. Social capital is referred to as firm's social interactions with formal and informal creditors, which is financial social capital, and social interactions with politicians and civil servants, which is political social capital. Using a control function estimation method with longitudinal data from repeated surveys of small- and medium-sized enterprises (SMEs) in Vietnam, we find an inverted U-shaped relationship between social capital and SMEs' performance, which is measured by gross profit and labor productivity. We further show that there is a positive complementary effect between innovation and social capital in affecting performance of SMEs.

**Keywords** Social capital · Small and medium enterprises · Performance · Innovation · Transition economies · Vietnam

**JEL Classification** O32 · L14 · L25 · L26

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## 1 Introduction

The performance of small and medium-sized enterprises (SMEs) depends largely upon their ability to acquire external resources and knowledge (Molodchik et al., 2020; Partanen et al., 2020). It has been argued that external resources and knowledge sourcing provide advantages associated to endorsements from exchange partners (Chang, 2004), furnish direct access to complementary resources (Devarakonda et al., 2022), facilitate the identification of new business opportunities (Batjargal, 2010) and guarantee access to new markets (Coviello, 2006).

Nevertheless, in the current business arena, it is difficult for SMEs to gain access to external resources particularly compared to larger counterparts (Lee et al., 2015). Therefore, it is recognized that identifying contingencies which facilitate access to external resources is of major importance for SMEs (Aldrich & Kim, 2007; Hernández-Carrión et al., 2017; Masiello & Izzo, 2019).

The social capital literature suggests that socially better-connected firms will be in a better position to achieve the desired results (Adler & Kwon, 2002; Batjargal, 2003; Batjargal & Liu, 2004; Rodrigo-Alarcón et al., 2020). It also describes the potential costs of networking activities (Laursen et al., 2012b). High levels of social capital may overload firms with obligations to partners (Gu et al., 2008), limit firms' openness to new ideas and alternative ways of doing things (Wincent et al., 2016), and increase flows of redundant information since firms are likely to concentrate exchanges of knowledge on network members (Uzzi, 1999).

Relying on social capital theory and resource-based theory of competitive advantage, the present study seeks to analyze whether and how social capital can become a source of competitive advantage for SMEs. Unlike previous studies which tend to focus on firms in developed countries, in this paper we analyze SMEs operating in a transition economy. Although it could be expected that social capital might operate differently in different contexts (Batjargal, 2010), we do not have much information on the link between social capital and performance of SMEs in transition economies (Batjargal, 2007; Boudreaux et al., 2022; Dalgic & Fazlioglu, 2021; Danquah & Sen, 2022; Le Van et al., 2018; Marjański et al., 2019) The present study aims to show how SMEs in a transition economy might benefit from distinct forms of social capital, i.e., financial and political social capital.

Social capital is defined variously in the literature (Adler & Kwon, 2002). There is, however, an agreement that it consists of networks of relationships and the resources inherent to these networks (Nahapiet & Ghoshal, 1998). Bourdieu (1980, p. 2) defines social capital as “the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition”. In this paper, we focus on network size<sup>1</sup> (Greve & Salaff, 2003), which is defined as the number of direct ties involving individual units (firms). We rely on environment-related social capital, which is understood as the relations a firm

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<sup>1</sup> We also use network intensity, which is frequency of network assistance to conduct robustness analysis.

establishes with key decision makers in its external environment (Westlund & Nilsson, 2005). We focus on political social capital, i.e., links to social politicians and civil servants, and financial social capital, i.e., links to banks and other financial institutions. In transition economies, those decision makers affect SMEs' performance by enabling them to overcome barriers deriving from economic and institutional instability (Danquah & Sen, 2022; Le Van et al., 2018). Additionally, social capital improves indirectly economic performance via innovation channel (Audretsch et al., 2018; Nam et al., 2009; Soete et al., 2010; Thompson, 2018). There is evidence from European Union countries (Akçomak & Ter Weel, 2009) and developing countries (Agénor & Dinh, 2015). While Putnam (2000) shows a positive association between social capital and economic growth in the first twentieth century, and in the late twentieth century, there is a reduced effect due to technological progress, time and money pressure.

Our study is conducted in a unique context of Vietnam, where the transition process is resulting in more dynamic social exchanges than other Western societies (World Bank, 2017). Since 2006, Vietnam has restructured to improve the quality and efficiency of economic growth. Social interactions in Vietnam are deeply embedded in local cultural and historical traditions (Poon et al., 2012; Ralston et al., 2006). According to the statistics from the GovData360, which is released annually by the World Bank (2022), the political participation index in Vietnam has been increasing from 1.5 in 2006 to 2.3 in 2020. The rising trend of the political participation index in line with increasing GDP in Vietnam. This setting makes Vietnam an interesting context for the study, which could shed light on the roles of local culture and social structures on SMEs' performance. SMEs are a major contributor to the Vietnamese economy, low SME profits would cause a substantial loss in government revenues (King-Kauanui et al., 2006). Therefore, the relevance of SMEs has induced institutions to provide SMEs with better access to finance, to lower corporate income tax, promote tax compliance, and support innovation activities.

This paper uses unique panel data from six rounds of biennial surveys of SMEs in Vietnam conducted from 2005 to 2015 to investigate the effects of social capital together with innovation, which is defined by OECD (2005), serving as a moderating factor on the SMEs' performance. We apply the control function method for the correlated random effects (CRE) estimation with panel data to deal with unobserved firm heterogeneity and endogeneity problems (Wooldridge, 2010, 2019). We find an inverted U-shaped relationship between SMEs' social capital and performance. We further analyze the moderating role of innovation in affecting the inverted U-shaped relationship between SMEs' social capital and performance (Haans et al., 2016). The results show that innovation moderates this inverted U-shaped relationship by either flattening the inverted U-shaped curve or shifting the inflection point, depending on types of social capital. This study adds to our understanding of the role and boundary conditions of social capital in a small business context. By applying the theories developed and tested in a Western social environment to a sample of SMEs in a transition economy, we contribute to the management research literature.

The remainder of this study is structured as follows. The next section provides a theoretical background and hypothesis development, which is followed by a section presenting methodology and data. In the fourth section, the empirical results

are interpreted, which is followed by a section on sensitivity tests. The final section offers discussion and concluding remarks.

## 2 Theoretical background and hypothesis development

Starting from the notion of market imperfections, the resource-based theory of competitive advantage states that owning valuable, rare, inimitable, and non-substitutable resources is a source of sustainable competitive advantage for firms (Hitt et al., 2001). Since firms cannot generate all the resources they require internally, they need to conduct exchanges with other organizations (Chesbrough, 2006; Laursen & Salter, 2006).

Various works consider the firm's social capital as a resource in itself which if correctly managed, can facilitate the firm's acquisition of external resources and knowledge (Auh & Menguc, 2005). This approach to social capital represents an emerging theoretical thread which emphasizes the inherent value of social structures (Hernández-Carrión et al., 2017). Social capital theory contends that firms' social ties with external actors are likely to influence their strategies due to the information, trust, and risk reduction benefits inherent in these relations (Nahapiet & Ghoshal, 1998).

The importance of social ties is amplified by the SME context since small firms' social ties are known to be critical for the entrepreneurial process (Partanen et al., 2020; Stam & Elfring, 2008). SMEs use their social capital to obtain information, advice, and support (Westlund & Nilsson, 2005), access financial capital (Boudreaux et al., 2022; Giudici et al., 2018), enhance the perceptions of external actors about their quality (Inkpen & Tsang, 2005), and mediate the relationship between corporate entrepreneurship and performance among firms in the Republic of Ireland (Simsek & Heavey, 2011).

The literature on social capital posits that social interactions with external actors facilitate firms' identification of new opportunities in both the USA and India (Bhagavatula et al., 2010; Devarakonda et al., 2022), increase the probability of product innovation in European countries (Laursen et al., 2012a; Pirolo & Presutti, 2010; Tappeiner et al., 2008), facilitate the mobilization of resources in China and Italy (Batjargal, 2003; Giudici et al., 2018), and build legitimacy in the Netherlands (Elfring & Hulsink, 2003), which reduces the liability of newness in early stage business in the UK (Laursen et al., 2016). While those studies focus on the benefits of social capital (Putnam, 1993), there are potential costs deriving from too high levels of social capital (Laursen et al., 2012b). Too much social capital can trap firms into particular networks (Gu et al., 2008) and prevent them from searching for opportunities outside the network (Adler & Kwon, 2002; Wincent et al., 2016).

The notion of social capital has been studied extensively in Western contexts. Putnam's (1993) analysis of social capital inspired an extensive literature on social interaction and community participation. In transition economies, it has been suggested that entrepreneurs' and managers' social capital has an impact on firms' revenues and profitability (Batjargal, 2003; Tang et al., 2021). In China, Batjargal (2010) analyzes an indigenous social phenomenon known as *guanxi* (connections), which

are the Chinese version of a social network. Chinese *guanxi* ties facilitate entrepreneurs' access to resources, enhance firm performance (Batjargal, 2007), increase job mobility and facilitate the raising of venture capital (Batjargal & Liu, 2004).

The role of social capital is particularly relevant for transition economies where it is difficult for firms to rely on formal infrastructures to acquire external knowledge and resources (Dalzic and Fazlıoğlu 2021; Enriquez-Perales et al., 2022; Mateut, 2018; Nieto et al., 2022). In those economies, the structural uncertainty derived from economic and institutional instability implies more problems for firms. As structural uncertainty increases, resource sharing among the actors becomes more necessary. Under conditions of greater structural uncertainty, social relationships become particularly essential for firms since they allow more stable and reliable flows of resources (Khoshmaram et al., 2020). This applies to the Vietnamese culture which emphasizes collectivism over individualism. In such environments, actors are evaluated on the basis of both their own competence and that of other individuals linked to them (Chen et al., 2004; Le Van et al., 2018; Nam et al., 2010).

## 2.1 Political social capital and SMEs' performance

Political networking refers to the extent to which firms cultivate relationships with government officials and administrative and regulatory agencies to obtain benefits (Li & Atuahene-Gima, 2001). In defining the determinants of social capital, Putnam (1993) refers to people's connections with their communities through associational activities and political participation. Political participation emphasizes the idea of citizens orienting their actions toward the public good through activities and relationships that encourage cooperation, support, and public communication. Putnam (1993) underlines that involvement in public activities represents a school of democracy. Through political participation, individuals increase the opportunities to interact with each other and to create links based on trust and cooperation. Through participation, citizens would come to share a common conception of general good and individual compliance. Therefore, political participation becomes a solvent of social conflicts and means of individual realization through active participation in community life. This approach to political participation, which has spawned significant literature, implies a positive role of political participation on economic outcomes. Through interaction and participation in political affairs, citizens may contribute to defining the direction of economic change. Participation teaches citizens attitudes and skills that they carry over into political activities and mobilizes them directly through group consciousness and solidarity.

Evidence on the importance for firms of political connections has been documented for countries with different economic systems (Faccio, 2006; Fisman, 2001; Goldman et al., 2009; Iorio & Segnana, 2022). There are various reasons why politically connected firms might achieve better performance compared to other firms. First, networking with individuals with political influence is an important strategy for firms to secure lower taxation, award of government contracts, and reduced regulatory requirements (Faccio, 2006; Goldman et al., 2009). All of these privileges increase their performance. Second, politicians are often external to the business

world and can provide the SMEs with an independent opinion of the organization, the market conditions, and customers' needs and demands, which eventually has a positive effect on performance (Faccio, 2006; Goldman et al., 2009). In addition, informal political connections do not necessarily lead to illegal practices such as corruption. Therefore, it could play a role of "greasing-the-wheels" to support firms (Iorio & Segnana, 2022).

However, the political networking effects on firm performance are not universal and may be context specific. In a transition economy, firms report that among the main factors affecting their performance, the political environment is the most influential, most complex, and least predictable.

To alleviate resource deficiencies in a context of high structural uncertainty (Pfeffer & Salancik, 2003), SMEs in transition economies tend to develop relationships with government officials, who may be able to help them attenuate their difficulties and identify new opportunities (Tang et al., 2021). In countries where legal enforcement is ineffective, SMEs with close political ties can exploit the power of their government connections to support their transactions and prevent unlawful competition. Research on the Chinese context shows that social ties with officials help firms achieve more institutional support to mitigate the challenges arising from uncertainty (Tang et al., 2021). Similarly, Markussen and Tarp (2014) find that political connections help entrepreneurs to increase their investment in agricultural land and secure the land rights in Vietnam. Zhou et al. (2022) argue that a network strategy linking small newly founded firms and local officials leads to better firm performance.

Although previous research argues in favor of a positive effect of political networking on firm performance in transition economies (Fan et al., 2007), we would suggest that too high a level of political social capital could be harmful for two main reasons. First, political networking might oblige a firm to return the favors or exchange favors with political actors. Those obligations could potentially result in damage and costs to the firm (Fan et al., 2007; Malesky & Taussig, 2009). In China, Fan et al. (2007) show that highly politically connected entrepreneurs significantly under-performed their unconnected counterparts since they faced high costs of disengagement and often became over-dependent on their political network. Malesky and Taussig (2009) provide similar results for Vietnam. Second, in transition economies, political networking does not involve agreement between equals and the SMEs usually benefit relatively less than the government officials from these links since the latter can extract excessive rents from their relationships with the firms (Fan et al., 2007; Sheng et al., 2011). In sum, we hypothesize that:

*H1a: Political social capital is curvilinearly (inverted U-shaped) related to the SMEs' performance.*

## 2.2 Financial social capital and SMEs' performance

Accessing financial resources has always been a major problem for SMEs (Carter & Auken, 2006) and affects their chances of success (Arinaitwe, 2006). Moral hazard and adverse selection suggest that obtaining external finance is particularly

difficult for SMEs because these firms tend to be more informationally opaque compared to larger firms (Berger & Udell, 2002). SMEs with the capabilities to conduct major projects may be unable to obtain finance because of their inability to provide evidence to potential external providers of their capabilities and assurance that the funding will not be diverted to an alternative project. In transition economies, insufficient institutional infrastructures generate an uncertain business environment which lowers the trust among actors (Nam & Tram, 2021). As a result, information obtained from external social ties “may be more trustworthy, richer, and more useful than information gained by other means” (Luo, 2003, p. 1317). In Vietnam, shortage of credit has been cited as the most critical problem for SMEs (CIEM, 2016; Le et al., 2021). SMEs in Vietnam reported two main difficulties related to acquiring formal credit: complicated lending procedures, and lack of collateral. As a result, SMEs often have to depend on their social networks to obtain credit.

Previous studies support the importance of firm-bank relationships to enable credit availability and ease credit terms such as interest rates and collateral requirements. We posit that one of the most powerful means available to SMEs to reduce information problems is networking with individuals employed in the banking sector. By exploiting this social capital, external providers of finance can acquire information on the SMEs before making their lending decisions (Boudreaux et al., 2022). Thus, social capital could have a positive effect on performance by reducing the cost to the firm of acquiring credit (Alexy et al., 2012). A large network of social ties to banks is beneficial for the firm because it enlarges the pool of potential lenders and allows the firm to play the banks off against one another (Alexy et al., 2012). However, too many contacts with external providers of finance can result in a complicated social network, which is difficult for the firm to manage (Uzzi, 1999). The study by Petersen and Rajan (1994) on the relationship between the firm and its creditors shows that close ties to creditors increase the firm’s likelihood of finding funding. If the firm attempts to widen its network to include multiple providers of finance, this can increase interest rates and reduce the availability of funding. Cole (1998) provides evidence that a potential creditor is less likely to extend a loan to a firm with multiple providers of finance. Therefore, we hypothesize that:

*H1b: Financial social capital is curvilinearly (inverted U-shaped) related to the SMEs’ performance.*

### **2.3 The moderating role of innovation on the relationship between SMEs’ social capital and performance**

Innovation is a crucial channel through which social capital has impacts on economic growth (Audretsch et al., 2018; Soete et al., 2010; Thompson, 2018). Akçomak and Ter Weel (2009) incorporate social capital in the production function and show that social capital improves economic growth by fostering innovation in European Union countries. Similarly, the process that firms in developing countries participate in innovative activities such as product imitation, which boosts accumulation of social capital, is effective to generate economic growth (Agénor & Dinh, 2015). Putnam (2000) documents that in the United States

during the twentieth century social capital had a diminishing effect on economic growth due to technological progress. Putnam's prediction is later confirmed in other studies (Antoci et al., 2013).

Haans et al. (2016) suggest that there are two distinct types of moderation effect on the inverted U-shaped relationship, and they should be tested separately: (i) the shape will become flatter or steeper; and (ii) the inflection point will shift. The first effect is grounded in the literature on absorptive capacity (Yuan et al., 2022) that to benefit from external resources and knowledge transmitted through social capital, firms must invest in in-house knowledge. Prior knowledge provides firms with an appropriate lens to recognize the value of external knowledge, to absorb this knowledge, and to filter out information of little relevance (Yuan et al., 2022). In the absence of prior knowledge, a firm might find it difficult to appreciate the value of external resources and knowledge with a potential consequence of inability to understand its application. Not all firms can be expected to benefit equally from social capital. Those that invest more in innovation should benefit more from both political and financial social capital thanks to their in-house knowledge.

The second effect is based on the high level of dysfunctional competition in transition economies. Dysfunctional competition implies copyright and patent violation, and difficulties related to monitoring and enforcing contracts (Li & Zhang, 2007). Under those conditions, the benefits resulting from the development of new technologies and products are better retained by SMEs with high levels of political social capital, which is associated to legitimacy and government protection. Therefore, political networking represents a complementary asset to materialize the benefits of innovation (Dalzic & Fazlıoğlu, 2021). In contrast, firms with low levels of political social capital may find that the benefits of their innovation are involuntarily leaked to other firms, which then copy their innovation or break contracts (Li & Zhang, 2007). Therefore, in transition economies we expect a complementary effect between innovation and political social capital, which affects firms' performance. Thus, we hypothesize that:

*H2a: Innovation moderates the inverted U-shaped relationship between political social capital and SMEs' performance.*

We also expect that the value of innovation for SMEs' performance will increase with higher levels of financial social capital. In transition economies characterized by poorly specified property rights, weak market mechanisms, and institutional uncertainty, investors make their decisions to offer funding to SMEs based on current projects and future strategies. SMEs' financial social capital signals investors' trust in the current strategies and the firm's future growth, which is an incentive for other creditors to provide additional financial support for innovative projects, leading to the increase in the value of innovation for SMEs' performance. Therefore, we predict a positive moderating effect of innovation on the relationship between SMEs' financial social capital and performance.

*H2b: Innovation moderates the inverted U-shaped relationship between financial social capital and SMEs' performance.*



### 3 Data and methodology

#### 3.1 Data

We use unbalanced panel data from six rounds of biennial surveys of SMEs in Vietnam, which have been conducted from 2005 to 2015 by the Institute of Labor, Science and Social Affairs, the Central Institute for Economic Management (CIEM), the University of Copenhagen, and the United Nations University World Institute for Development Economic Research (UNU-WIDER). The surveys cover randomly selected manufacturing SMEs in 10 provinces in Vietnam. A stratified random sample was created during each round of survey (Rand & Tarp, 2007). The number of SMEs in selected provinces covered about 60 percent of the population of non-state manufacturing firms in Vietnam (The General Statistics Office of Vietnam, 2016). In each round, more than 2500 SMEs were surveyed and the total number of sampled SMEs for six rounds of surveys adds up to around 15,000. The SMEs surveyed included survivals from the previous surveys and newly added SMEs, which were randomly selected from the population. According to CIEM (2016) and Rand and Tarp (2007), the tracer survey feature of the data helps to capture the dynamics of the business environment in Vietnam.

The data collected were for the previous year. For example, data collected in the 2005 survey provide information on the characteristics of the SMEs, their production, and social capital in 2004. The sampled SMEs belong to different industries including food products, beverages, textiles, wearing apparel and leather products, wood products, paper products, printing and reproduction of recorded media, petroleum products, chemical, pharmaceutical, plastic products, non-metallic, mineral products, basic metal and metal product, electronic products, equipment, machinery, transport equipment, and furniture.

##### 3.1.1 Measures

The dependent variable in our regressions is SMEs' performance, which is measured in conventional ways by gross profit and labor productivity (Batjargal, 2003). Gross profit is calculated as value added minus wage payment. Value added is equal to sales revenue minus intermediate costs. We use the logarithm of real gross profit in our regressions, which causes removal of the SMEs with negative profit.<sup>2</sup> Following Lieberman and Kang (2008), we measure labor productivity by taking the logarithm of value added divided by the number of regular workers. Real gross profit and real labor productivity were obtained by deflating them with GDP deflators.

We use SMEs' network size (Greve & Salaff, 2003; Santarelli & Tran, 2013) to measure social capital. Political social capital is measured by the number of politicians and civil servants, who were contacted by the owner/manager of an SME at least once every three months and provided substantial contributions to the business

<sup>2</sup> As a result, we removed these SMEs from our sample. The number of removed SMEs were 18, 10, 8, 7, 46, and 70 in 2005, 2007, 2009, 2011, 2013 and 2015, respectively.

operations of the SME. To measure financial social capital, we use the number of credit providers, who were contacted by the owner/manager of an SME at least once every three months and provided a substantial contribution to the business operations of the SME.<sup>3</sup> Credit providers include formal and informal lenders to the SMEs. Formal providers are commercial banks and other formal financial institutions. Informal providers include input suppliers with delayed payments and friends and relatives of the SME's owner/manager.

The moderating variable *innovation* takes the value of 1 if an SME has reported at least one of the followings: (1) development of a new product, (2) improvement of an existing product, or (3) development of a new production process, and 0 otherwise. The SME's owner/manager during the survey was requested to answer the question "having innovative activities during the last two years". Because the innovative activities had been conducted before the time of the SMEs' survey, we may reasonably assume that the innovation variable with the lagged values is not endogenous.

In our regressions, we control for capital since it is often used to proxy for economic size (Koch & McGrath, 1996). We include the logarithm of the year-end value of the total fix assets, which is deflated by the GDP deflator. Variable *Firm Age* is included to control for any advantages associated with the evolution of work practices or learning curve advantages (Jiang et al., 2022). *Firm Age* is measured as the logarithm of number of years of operation of the SME. *Firm Size* is likely to have an important effect on performance because larger enterprises are associated with larger scale operations (Koch & McGrath, 1996). Therefore, we control for *Firm Size* using the logarithm of the number of regular workers. We also include the square of *Firm Size* ( $Firm\ Size^2$ ) to measure any possible diminishing effects. A firm's participation in exporting activities influences its performance. We, thus, include a dummy variable for exporter, which is equal to 1 if an SME exports and 0 otherwise. In addition, we control for *Infrastructure* conditions, which is a dummy variable taking the value of 1 if there is a main road leading to an SME and 0 otherwise. In Vietnam, more than 91 percent of passengers and 70 percent of freight are transported by road. These ratios have been increasing (Ministry of Transport of Vietnam, 2013). Thus, access to a road has an essential influence on SMEs' performance. The literature shows that there are industry differences in terms of firm performance (Higuchi, 2020). Dummy variables are, hence, used to control for *Industry* effects. Previous studies demonstrate that geography has an effect on firm performance (Audretsch & Keilbach, 2004). We, therefore, control for the *Provincial Location* of SMEs using dummy variables. Finally, we include time dummy variables to control for business cycles. Table 1 presents the basic statistics of the

<sup>3</sup> We used the question "In this year, how many people do you have regular contact at least once every 3 months, which you find useful for your business operations?" in the questionnaire to capture network size of SME, which is answered for politicians and credit provider separately. We also measure financial and political social capital using different variables providing information on the number of times that bank officers and politicians and civil servants assisted the owner/manager over firm operational issues during the previous year. We will discuss about them in Sensitivity Tests section.

**Table 1** Basic statistics of main variables

Variable	Definitions	Mean	Standard deviation	Min	Max
<b>Dependent variable</b>					
Profit	Logarithm of real total gross profit	12.019	1.493	5.04	19.76
Productivity	Logarithm of real value added in thousand Vietnam Dong divided by the number of regular workers	10.678	0.786	6.52	17.11
<b>Main independent variables</b>					
PSC	Political social capital, which is measured by the number of politicians and civil servants with whom the owner/manager of the SME contacts at least once every three months	1.529	2.520	0.00	50.00
FSC	Financial social capital, which is measured by the number of credit providers with whom the owner/manager of the SME contacts at least once every three months	1.104	1.987	0.00	60.00
IN	Innovation of the SME, which is proxied by a dummy variable that takes the value of 1 if the SME has attained at least one of three categories of innovation: (1) development of new products; (2) improvement of existing products; and (3) development of new production process, and 0 otherwise	0.433	0.495	0.00	1.00
<b>Control variables</b>					
Fix assets	Logarithm of real fix assets in thousand Vietnam Dong	12.931	2.712	2.76	20.91
Firm age	Logarithm of years of operation of the SME	2.408	0.709	0.69	4.34
Firm size	Logarithm of the number of regular workers	1.857	1.171	0.00	7.56
Exporter	Export of the SME, which is proxied by a dummy variable that takes the value 1 if the SME exports, and 0 otherwise	0.062	0.242	0.00	1.00
Infrastructure	Infrastructure condition, which is proxied by a dummy variable that takes the value of 1 if there is a main road leading to the SME, and 0 otherwise	0.792	0.406	0.00	1.00
<b>Instrumental variable</b>					
LCs	Local cadres, which is proxied by a dummy variable that takes the value 1 if the previous main work's experience/positions of the SME's owner/manager being local cadres, or in mass organizations (e.g., farmers' union, women' union), and 0 otherwise	0.122	0.327	0.00	1.00

*n* = 15,147

main variables. Table 2 presents the correlation coefficients of the variables. All the correlation coefficients of the independent variables are of our expectation.

## 4 Estimation strategy

### 4.1 Regression specification

To test the inverted U-shaped relationship between SMEs' social capital and performance we apply the following regression:

$$PER_{it} = \alpha_0 + \alpha_1 SC_{it} + \alpha_2 SC_{it}^2 + \alpha_3 IN_{it} + \gamma X_{it} + c_{1i} + \varepsilon_{1it} \quad (1)$$

where  $PER_{it}$  is the logarithm of gross profit or the logarithm of labor productivity of SME  $i$  at time  $t$ ;  $SC_{it}$  denotes political or financial social capital;  $IN_{it}$  is innovation;  $X_{it}$  is a set of control variables including the logarithm of the fix assets, firm age, firm size, square of firm size, exporter, infrastructure, time dummies, industry dummies, and provincial location dummies;  $\varepsilon_{1it}$  is the idiosyncratic errors; and  $c_{1i}$  is the firm fixed effect or unobserved heterogeneity. Under the hypothesis of a curvilinear effect of social capital (H1a and H1b), we expect the sign of  $\alpha_2$  to be negative in Eq. (1).

To test Hypotheses H2a and H2b, we adjust Eq. (1) to allow for interaction between social capital and innovation. The estimation function is as follows.

$$PER_{it} = \beta_0 + \beta_1 SC_{it} + \beta_2 SC_{it}^2 + \beta_3 SC.IN_{it} + \beta_4 SC^2.IN_{it} + \beta_5 IN_{it} + \varphi X_{it} + c_{2i} + \varepsilon_{2it}, \quad (2)$$

where  $SC.IN_{it}$  and  $SC^2.IN_{it}$  are interaction terms between social capital and the square of social capital with innovation, respectively;  $\varepsilon_{2it}$  is the idiosyncratic errors; and  $c_{2i}$  is the firm fixed effect. The other variables are the same as in Eq. (1).

#### 4.1.1 Endogeneity problems with non-linear estimation

Social capital is potentially endogenous in both Eqs. (1) and (2) since it could be correlated with the idiosyncratic errors ( $\varepsilon_{it}$ ) and/or unobserved firm heterogeneity ( $c_i$ ). We may apply the Fixed Effects (FE) or Random Effects (RE) methods along with relevant instrumental variables by using two-stage least squares (2SLS) estimation with panel data, which eliminate the endogeneity. Nevertheless, firm performance is a nonlinear function of social capital in both equations. Wooldridge (2010) suggests a correlated random effects (CRE) approach, which was pioneered by Mundlak (1978), along with instrumental variables by using a control function method. This method is consistent with the FE and RE instrumental variables methods. Moreover, it is more efficient and flexible with unbalanced panel data and nonlinear panel data models (Joshi & Wooldridge, 2019; Wooldridge, 2010, 2019). In terms of the CRE approach, we can add the time averages of the time-variant independent variables to eliminate the unobserved heterogeneity, which is identical to the FE models. The CRE approach has an advantage over the FE model as it can estimate the effects of

**Table 2** Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
1. Profit	1.000										
2. Productivity	0.766***	1.000									
3. PSC	0.163***	0.094***	1.000								
4. FSC	0.237***	0.140***	0.347***	1.000							
5. IN	0.219***	0.114***	0.071***	0.060***	1.000						
6. Fix assets	0.529***	0.301***	0.100***	0.132***	0.186***	1.000					
7. Firm age	-0.170***	-0.134***	-0.003	-0.028***	-0.102***	-0.159***	1.000				
8. Firm size	0.798***	0.307***	0.173***	0.250***	0.250***	0.531***	-0.170***	1.000			
9. Firm size^2	0.381***	0.036***	0.110***	0.161***	0.080***	0.185***	-0.015	0.487***	1.000		
10. Exporter	0.346***	0.159***	0.092***	0.106***	0.112***	0.186***	-0.051***	0.387***	0.371***	1.000	
11. Infrastructure	0.197***	0.173***	0.053***	0.067***	0.073***	0.101***	-0.073***	0.189***	0.046***	0.052***	1.000

Firm size and Firm size^2 variables are centered; \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

both time-variant and time-invariant independent variables. The advantage remains with changing variables such as innovation dummy, export dummy, infrastructure, industry, and location in our unbalanced panel data (Wooldridge, 2010).

In the 2SLS estimation method, the fitted value of the endogenous variable, which is obtained from the reduced-form equation in the first stage, is used in the second stage. In the control function method, the CRE residuals, fixed effects residuals, random effects residuals, or pooled OLS residuals are obtained from the reduced-form equation in the first stage and used in the second stage. If these residuals are statistically significant in the second stage, social capital is statistically endogenous and the instrumental method is needed. We apply the CRE instrument variable estimation by using the control function method for our nonlinear panel data models. The instrument variable determines the endogenous social capital variable but does not affect firm performance.

Social capital of a person is, by its nature, contingent on his/her past (Devarakonda et al., 2022). We, thus, use the previous work's experience/position of an SME's owner/manager as an instrument. Being either a local cadre at the commune, district, or province level or a member of an organization such as a farmers' union or women' union<sup>4</sup> prior to owning/managing the SME provide the owner/manager with an advantage to build up his/her political or financial connections with others. The instrument *Local Cadres* (LCs) is likely to determine political and financial social capital but does not have influence on SMEs' performance.

We estimate the reduced-form Eq. (3) in the first stage by the CRE approach to obtain the CRE residuals  $\hat{v}_{it}$  and take its square. These components and the time averages of the time-variant covariates as  $\overline{LCS}_{it}$ ,  $\overline{IN}_i$  and  $\overline{X}_i$  are substituted in Eqs. (1) and (2). We then have control function Eqs. (4) and (5), respectively.<sup>5</sup> This procedure is similar to the Hausman's test to detect endogeneity (Wooldridge, 2010; Joshi & Wooldridge, 2019).

$$SC_{it} = \pi_0 + \pi_1 LCS_{it} + \pi_2 \overline{LCS}_{it} + \pi_3 IN_{it} + \pi_4 \overline{IN}_i + \theta X_{it} + \theta' \overline{X}_i + c_{3i} + \varepsilon_{3it} \quad (3)$$

$$PER_{it} = \alpha_0 + \alpha_1 SC_{it} + \alpha_2 SC_{it}^2 + \alpha_3 IN_{it} + \gamma X_{it} + \gamma' \overline{Z}_{1i} + \rho_1 \hat{v}_{it} + \rho_2 \hat{v}_{it}^2 + a_{1i} + e_{1it} \quad (4)$$

$$PER_{it} = \beta_0 + \beta_1 SC_{it} + \beta_2 SC_{it}^2 + \beta_3 SC.IN_{it} + \beta_4 SC^2.IN_{it} + \beta_5 IN_{it} + \varphi X_{it} + \varphi' \overline{Z}_{2i} + \rho_3 \hat{v}_{it} + \rho_4 \hat{v}_{it}^2 + a_{2i} + e_{2it} \quad (5)$$

Wooldridge (2010) suggests that we have to include two control functions ( $\hat{v}_{it}$  and  $\hat{v}_{it}^2$ ) to account for the endogeneity of  $SC_{it}$  and  $SC_{it}^2$  in Eq. (4), and  $SC_{it}$ ,  $SC_{it}^2$ ,  $SC.IN_{it}$  and  $SC^2.IN_{it}$  in Eq. (5). The CRE approach is used to estimate the first stage

<sup>4</sup> This instrument variable is utilized by answering the question "What was the previous main work's experience/positions of respondent before owning or managing this firm?" in the questionnaire.

<sup>5</sup>  $\overline{Z}_{1i}$  in Eq. (4) includes  $\overline{LCS}_{it}$ ,  $\overline{IN}_i$ ,  $\overline{X}_i$  and the time averages of social capital and the square of social capital.  $\overline{Z}_{2i}$  in Eq. (5) includes  $\overline{Z}_{1i}$  and the time averages of interaction variables ( $SC.IN_{it}$  and  $SC^2.IN_{it}$ ), which are able to eliminate the unobserved firm heterogeneity in the second stage.

**Table 3** The CRE estimation results from the first stage of Eq. (3)—Instrumental variable, LCs

	(1) PSC	(2) FSC
LCs	0.556*** (0.088)	0.289*** (0.063)
IN	0.131** (0.052)	0.057 (0.038)
Fix assets	0.082*** (0.021)	0.009 (0.015)
Firm age	−0.121** (0.059)	−0.023 (0.043)
Firm size	0.064 (0.053)	0.173*** (0.038)
Firm size <sup>2</sup>	0.008 (0.022)	0.002 (0.016)
Exporter	0.292* (0.154)	−0.139 (0.111)
Infrastructure	0.029 (0.069)	0.091* (0.050)
_cons	−0.627* (0.332)	0.027 (0.313)
Provincial location dummies	Yes	Yes
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
<i>N</i>	15,147	15,147
<i>R</i> <sup>2</sup>	0.108	0.132

Standard errors in parentheses; The time averages of the time-variant covariates as  $\overline{LCs}_i$ ,  $\overline{IN}_i$  and  $\overline{X}_i$  are excluded from Table. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

Eq. (3), and the second stage Eqs. (4) and (5) by implementing standard RE estimator. Additionally, we control for heterogeneity and serial correlation in the idiosyncratic errors ( $e_{1it}$  and  $e_{2it}$ ) in Eqs. (4) and (5), respectively, by using a cluster-robust standard error (Wooldridge, 2010).<sup>6</sup> The result of CRE estimator from the first stage Eq. (3) in Table 3 shows that our instrument variable,  $LCs_{it}$ , is valid when its coefficients for both political social capital and financial social capital, which is measured by either network size or network intensity, are significant. A significant joint test of  $\hat{v}_{it}$  and  $\hat{v}_{it}^2$  indicates that social capital is endogenous (see the results in Tables 4 and 5).

#### 4.1.2 Testing for an inverted U-shaped relationship and moderating effects

We test the hypotheses that both financial and political social capital have an inverted U-shaped relationship with SMEs' performance by estimating  $\alpha_2$  in Eq. (4). The finding that  $\alpha_2$  is negative and significant is not sufficient to draw conclusions about this relationship. According to Lind and Mehlum (2010) and Haans et al. (2016), to confirm the inverted U-shaped relationship requires three conditions. First,  $\alpha_2$  must be negative and significant. Second, the slopes of the lower and upper bounds of the performance curve as a function of social capital must be respectively significantly positive and negative. If only one is significant, merely one half of the U-shaped

<sup>6</sup> We use the command `xtreg y x, re vce(cluster firmid)` in Stata 16 to estimate Eqs. (4) and (5).

**Table 4** Estimation results from firm performance Eqs. (4) and (5) using control function methods for the CRE estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Profit	Productivity	Profit	Productivity	Profit	Productivity	Profit	Productivity
PSC	0.127** (0.054)	0.092** (0.042)			0.136** (0.054)	0.103** (0.043)		
PSC <sup>Δ2</sup>	-0.005*** (0.002)	-0.003** (0.001)			-0.006*** (0.002)	-0.003** (0.001)		
PSC*IN								
PSC <sup>Δ2</sup> *IN								
FSC			0.213** (0.104)	0.164** (0.081)	0.001** (0.001)	0.001*** (0.001)	0.212** (0.104)	0.163** (0.081)
FSC <sup>Δ2</sup>			-0.002 (0.003)	-0.003 (0.002)			-0.003 (0.003)	-0.003 (0.002)
FSC*IN							-0.002 (0.011)	-0.001 (0.008)
FSC <sup>Δ2</sup> *IN							0.001 (0.001)	0.001 (0.001)
IN	0.084*** (0.017)	0.066*** (0.013)	0.087*** (0.017)	0.068*** (0.013)	0.095*** (0.021)	0.085*** (0.016)	0.085*** (0.019)	0.066*** (0.015)
Fix assets	0.090*** (0.008)	0.070*** (0.007)	0.097*** (0.007)	0.075*** (0.006)	0.090*** (0.008)	0.070*** (0.007)	0.097*** (0.007)	0.075*** (0.006)
Firm age	0.043** (0.021)	0.026 (0.017)	0.035* (0.020)	0.020 (0.016)	0.044** (0.021)	0.027 (0.017)	0.035* (0.020)	0.020 (0.016)
Firm size	0.507*** (0.018)	-0.279*** (0.016)	0.477*** (0.025)	-0.300*** (0.021)	0.507*** (0.018)	-0.279*** (0.016)	0.478*** (0.025)	-0.300*** (0.021)
Firm size <sup>Δ2</sup>	0.019** (0.008)	0.001 (0.006)	0.019** (0.008)	0.001 (0.006)	0.019** (0.008)	0.001 (0.006)	0.019** (0.008)	0.001 (0.006)
Exporter	0.106* (0.061)	0.153*** (0.044)	0.162*** (0.060)	0.194*** (0.043)	0.108* (0.061)	0.155*** (0.044)	0.162*** (0.060)	0.193*** (0.043)
Infrastructure	0.006 (0.020)	0.017 (0.017)	-0.010 (0.022)	0.006 (0.018)	0.006 (0.020)	0.017 (0.017)	-0.009 (0.022)	0.006 (0.018)
$\hat{\gamma}_{it}$ -PSC	-0.096* (0.054)	-0.069* (0.042)			-0.095* (0.054)	-0.068 (0.042)		
$\hat{\gamma}_{it}^2$ -PSC	0.005*** (0.002)	0.002* (0.001)			0.005** (0.002)	0.002 (0.001)		
$\hat{\gamma}_{it}$ -FSC			-0.196* (0.103)	-0.144* (0.080)			-0.193* (0.103)	-0.142* (0.080)
$\hat{\gamma}_{it}^2$ -FSC			0.002 (0.003)	0.003 (0.002)			0.003 (0.003)	0.003 (0.002)
_cons	9.176*** (0.138)	8.426*** (0.107)	9.122*** (0.134)	8.383*** (0.103)	9.175*** (0.139)	8.4187*** (0.107)	9.131*** (0.134)	8.383*** (0.104)
Testing for firm effects in Eq. (4)—chi2 (30)	1398.06***	1507.25***	1352.97***	1486.20***				



**Table 4** (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Profit	Productivity	Profit	Productivity	Profit	Productivity	Profit	Productivity
Testing for endogeneity in Eq. (4)— $\chi^2(2)$	10.06***	6.08**	4.15	4.81*				
Testing for infection point shift in Eq. (5)— $\chi^2(1)^a$					0.86	0.44	0.16	0.32
Provincial location dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	15,042	15,147	15,042	15,147	15,042	15,147	15,042	15,147
<i>R</i> <sup>2</sup>	0.794	0.455	0.794	0.455	0.796	0.460	0.796	0.460

Robust standard errors in parentheses clustered at the firm; the time averages of the time-variant covariates in Eqs. (4) and (5) are excluded from Table

<sup>a</sup>The results of the test for nonlinear combinations of parameter estimates is from nlcom and test commands in Stata. The residuals,  $\hat{v}_{it}$ , are obtained from Eq. (3) by using the CRE estimator. For Column (1): The joint test for industry dummies,  $\chi^2(11) = 25.29^{***}$ . The joint test for provincial location dummies,  $\chi^2(9) = 995.90^{***}$ . The joint test for time dummies,  $\chi^2(5) = 392.37^{***}$ . For Column (2): The joint test for industry dummies,  $\chi^2(11) = 31.33^{***}$ . The joint test for provincial location dummies,  $\chi^2(9) = 1728.02^{***}$ . The joint test for time dummies,  $\chi^2(5) = 596.01^{***}$ . For Column (3): The joint test for industry dummies,  $\chi^2(11) = 27.28^{***}$ . The joint test for provincial location dummies,  $\chi^2(9) = 716.49^{***}$ . The joint test for time dummies,  $\chi^2(5) = 368.98^{***}$ . For Column (4): The joint test for industry dummies,  $\chi^2(11) = 30.55^{***}$ . The joint test for provincial location dummies,  $\chi^2(9) = 1225.05^{***}$ . The joint test for time dummies,  $\chi^2(5) = 562.16^{***}$ ;  $*p < 0.10$ ,  $**p < 0.05$ ,  $***p < 0.01$

**Table 5** Testing for the inverted U-shaped relationship between social capital and firm performance

	Profit		Productivity		Profit		Productivity	
	Political social capital		Political social capital		Financial social capital		Financial social capital	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
Interval	0	50	0	50	0	60	0	60
Slope	0.127	-0.327	0.092	-0.159	0.213	-0.053	0.164	-0.204
<i>t</i> value	2.350	-1.988	2.189	-1.339	2.058	-0.155	2.039	-0.763
<i>P</i> value	0.009	0.023	0.014	0.090	0.019	0.438	0.020	0.223
95% Fieller interval for inflection point	2.388		35.796	2.090	48.504		Out of range	
Inflection point	14		18		48		27	

The results in this Table are obtained using the `utest` command in Stata which was provided by Lind and Mehlum (2019)

curve is disclosed by the data. Third, the inflection point should be within the data range based on checking the 95% confidence interval for the inflection point.<sup>7</sup>

By estimating Eq. (5), we are interested in how innovation moderates the effects of social capital on SMEs' performance. According to Haans et al. (2016), it is necessary to show whether there is a shift of the inflection point (ip) and a flattening out or steepening of the firm performance curve as a function of social capital. From Eq. (5), we take the first order condition with respect to social capital and set it to zero. We obtain Eq. (6) as follows.

$$SC^{ip} = \frac{-\beta_1 - \beta_3 IN}{2\beta_2 + 2\beta_4 IN} \quad (6)$$

Equation (6) provides the value of social capital at the inflection point. If the change in this value with respect to different states of innovation is statistically significant, we can conclude that the inflection point shifts. If the dummy variable for innovation equals "0" and "1", the values are respectively  $SC_0^{ip} = \frac{-\beta_1}{2\beta_2}$  and  $SC_1^{ip} = \frac{-\beta_1 - \beta_3}{2\beta_2 + 2\beta_4}$ . We test whether  $SC_0^{ip}$  is significantly different from  $SC_1^{ip}$ .<sup>8</sup>

To conclude about the flattening or steepening of the performance curve, we count on the sign of  $\beta_4$  in Eq. (5) (Haans et al., 2016). If  $\beta_4$  is positive and significant, flattening prevails. If  $\beta_4$  is negative and significant, steepening prevails.

## 5 Regression results

We investigate the effects of social capital and its interaction with innovation on the SMEs' performance in Eqs. (4) and (5), respectively, by applying the control function methods for CRE panel data approach. The second-stage regression results along with the test for firm effects, the test for endogeneity of social capital (Joshi & Wooldridge, 2019; Wooldridge, 2010, 2015, 2019), and the test for inflection point shift (Haans et al., 2016) are reported in Table 4. Table 5 presents the test for inverted U-shaped relationship between social capital and SMEs' performance as suggested by Lind and Mehlum (2010) and Haans et al. (2016).

Testing values for firm effects and endogeneity of social capital in Columns from (1) to (4) in Table 4 are significant,<sup>9</sup> showing that the control function method for the CRE approach with an instrumental variable is better to account for the unobserved

<sup>7</sup> To test for inverted U-shaped relationships, we use Lind and Mehlum's (2019) user-written `utest` command in Stata.

<sup>8</sup> We use the `nlcom` and `test` commands in Stata to test for this difference.

<sup>9</sup> Only value of jointly testing for endogeneity of financial social capital— $\chi^2(2)=4.15$ ,  $p$ -value=0.1258, in column (3) for operating profit is weak confirmation. However, the residual of financial social capital is still significant at 10%, which may confirm its endogeneity. Furthermore, we estimate Eq. (4) without controlling for endogeneity by using the "native" RE models and the CRE models. The estimation results are consistent with Columns from (1) to (4) in Table 4. The estimation results are available upon request.

heterogeneity and endogeneity than the RE approach with an instrumental variable (Joshi & Wooldridge, 2019; Wooldridge, 2010).

Results in Columns (1) and (2) in Table 4 show that the coefficients of the square of political social capital ( $PSC^2$ ) are negative and significant, suggesting an inverted U-shaped relationship between political social capital and gross profit and labor productivity. The second and third conditions of this inverted U-shaped relationship are shown in Table 5. The slopes at the lower bound are positive and significant. The slopes at the upper bound are negative and significant for the gross profit and labor productivity equations. The values of the political social capital at the inflection point are 14 or 18 for the gross profit and labor productivity equations, respectively. These values are in the fourth quartile of the political social capital values. These values indicate that if an SME owner/manager has more than 14 or 18 political social connections, they are no longer beneficiary to performance. The 95% Fieller interval for the inflection points are within the data range of [0; 50], indicating that political social capital has a positive but diminishing effect on SMEs' performance, which supports Hypothesis 1a.

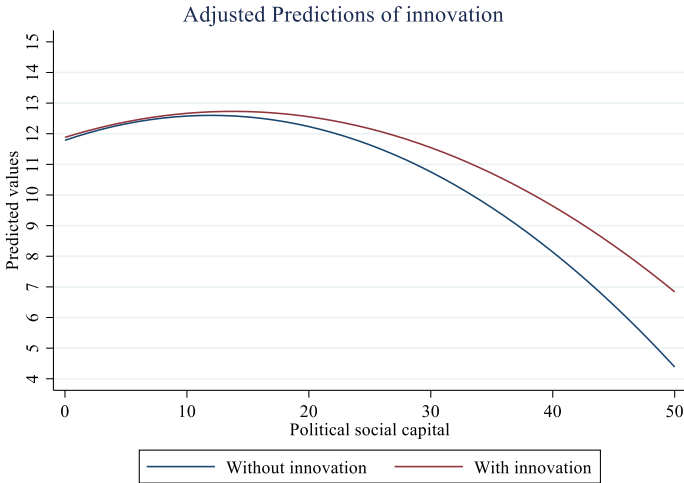
Findings for the relationship between financial social capital and SMEs' performance are presented in Table 4 with Column (3) for gross profit and Column (4) for labor productivity. The square of financial social capital variables ( $FSC^2$ ) is negative in Column (3) and Column (4) but insignificant. In Table 5, the slopes at the lower bound are positive and significant. The slopes at the upper bound are negative but not significant. These results confirm only the left half of the U-shaped relationship, which is on a positive trend (Haans et al., 2016) between SMEs' performance and financial social capital. These findings partly support Hypothesis 1b.

Estimations of the moderating effects of innovation on the relationship between political social capital and financial social capital and SMEs' performance are presented in Columns (5) and (6), and Columns (7) and (8) in Table 4, respectively.

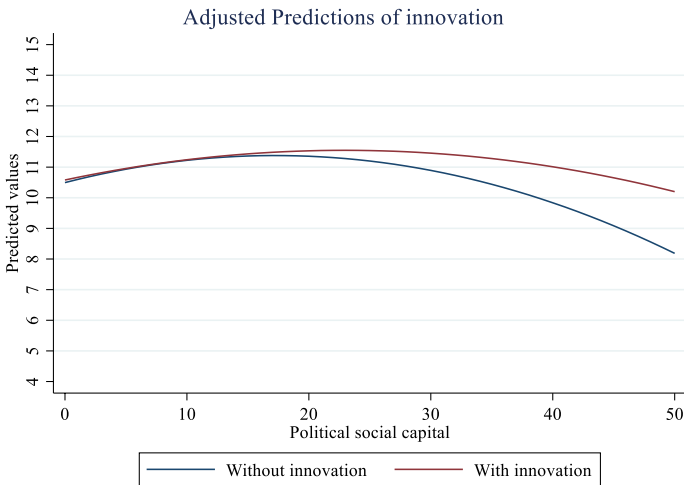
The estimation of gross profit and labor productivity with political social capital in Columns (5) and (6) in Table 4, respectively. The results of testing for inflection point shift with innovation and without innovation are statistically insignificant, with  $\chi^2(1) = 0.86$  for profit and  $\chi^2(1) = 0.44$  for labor productivity. The flattening of the performance curve occurs because the coefficients of  $PSC^2 \cdot IN$  in Columns (5) and (6) in Table 4 are positive and statistically significant. It is noted that when the lagged values of the social capital variables, which are taken from the previous round of the survey, are in place the results remain unchanged. Therefore, our findings are confirmed.<sup>10</sup>

Figures 1 and 2 show the effects of political social capital on gross profit and labor productivity with and without innovation, respectively. The flattened curves with innovation confirm the positive moderating effect of innovation on the inverted U-shaped relationship between political social capital and SMEs' performance. The findings confirm that innovation significantly shifts the curves depicting the relationship between political social capital and SMEs' performance. The fact that innovation does not affect the inflection points, which partly supports Hypothesis 2a.

<sup>10</sup> The estimation results will be provided upon request.

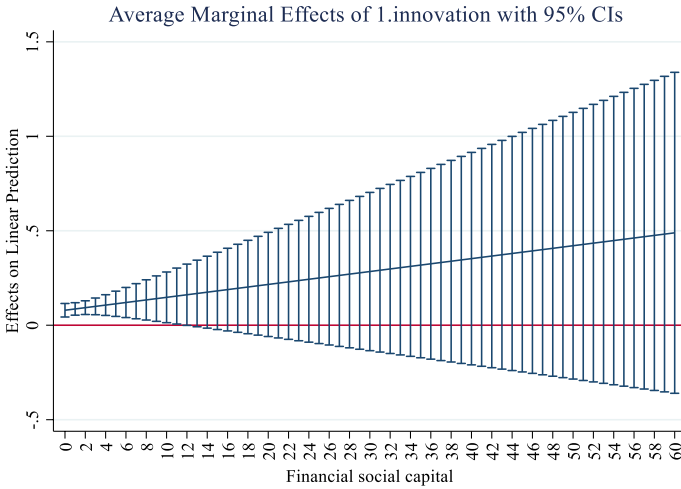


**Fig. 1** Relationship between the logarithm of gross profit and political social capital with innovation as a moderator

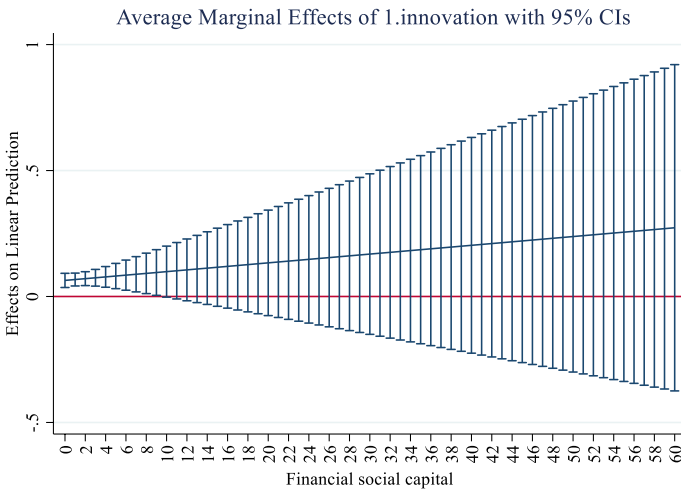


**Fig. 2** Relationship between the logarithm of labor productivity and political social capital with innovation as a moderator

In the estimation of gross profit and labor productivity with financial social capital presented in Columns (7) and (8) of Table 4, the results of testing for inflection point shift are statistically insignificant with  $\chi^2(1)=0.16$  for gross profit and  $\chi^2(1)=0.32$  for labor productivity. We do not find a steepening or flattening process of the performance curve as the coefficients of  $FSC^2*IN$  in Columns (7) and (8) are statistically insignificant. The coefficients of  $FSC*IN$  are also statistically insignificant. These findings show that innovation does not shift the inflection point nor change the curve showing the effects of financial social



**Fig. 3** Relationship between the logarithm of gross profit and political social capital with innovation as a moderator



**Fig. 4** Relationship between the logarithm of labor productivity and political social capital with innovation as a moderator

capital on SME’s performance, thus, not supporting Hypothesis 2b. We, however, re-estimate Eq. (5) and then predict the marginal effects to determine the effect of the range of financial social capital values conditioning on innovation by using only interaction IN and FSC variables. As a result, Fig. 3 for gross profit and Fig. 4 for labor productivity show that the differences in average marginal

effects are significant for values of financial social capital less than 10 and 12, respectively.<sup>11</sup>

In all eight estimation models in Table 4, the coefficients of innovation (IN variable) are positive and statistically significant, confirming that innovation enhances SMEs' performance (Mohnen & Hall, 2013; Pellegrino & Piva, 2019). We observe also that the fix assets have positive and significant effects on SMEs' performance. This finding implies that an SME can achieve higher performance by investing in physical capital. The number of years of operation of an SME has a positive and significant effect on gross profit, suggesting that older SMEs have larger gross profit than others. Firm age does not have any effects on labor productivity. Performance is a non-linear function of firm size. Additionally, exporter has statistically significant effects on performance.<sup>12</sup> Finally, access to a main road has no impact on SMEs' performance.

## 6 Sensitivity tests

We conduct additional sensitivity tests to confirm our analysis. First, we calculate general social capital (GSC) as the sum of political and financial social capital. We then re-estimate Eqs. (3), (4), and (5) with GSC. The regression results show that social capital has an inverted U-shaped relationship with SMEs' performance.<sup>13</sup> Innovation is found to have positive moderating effects to flatten the inverted U-shaped relationship between GSC and SMEs' performance. These results are consistent with our previous findings.

Second, we realize that political and financial social capital variables have the conditional standard deviation exceeding the conditional mean due to many zero values when SMEs reported not having any networks with politicians or credit providers. We thus re-estimate Eq. (3) as count models by using the CRE approach for Poisson and Negative binomial models instead of the CRE approach for the linear panel data models in the first stage.<sup>14</sup> The regression results for the Poisson model and for the negative binomial, respectively, are similar to those in Table 4, indicating that our results are robust regardless of the estimation techniques.<sup>15</sup>

We also use the political and financial social capital measured by network intensity, i.e., the number of politicians and civil servants' assisting times (PSC NI) and

<sup>11</sup> We re-estimate Eq. (5) by removing  $SC_{it}^2$ ,  $SC^2.IN_{it}$ , and  $\hat{v}_{it}^2$ , then we use “margins, dydx(IN) at(FSC=(0(1)60)) vsquish” and “marginsplot, recast(line) yline(0) xlabel(0(2)60) xlabel(, angle(90))” commands in Stata 16 to obtain Figs. 3 and 4.

<sup>12</sup> To control for possible effects of different foreign markets on inducing the innovation and conditioning the social capital, we have included dummies for these markets in the replacement of the export dummy. The results are robust against this change.

<sup>13</sup> The regression results are available upon request.

<sup>14</sup> We estimated Eq. (3) by using glm command in Stata 16 with poisson or negative binomial in family function and log in link function options along with firm-clustered standard errors.

<sup>15</sup> The regression results are available upon request.

the number of credit providers' assisting times (FSC NI).<sup>16</sup> The regression results are consistent with those in Table 4, indicating that our results are robust regardless of measures of social capital. It is further noted that the regression results with dummies for both FSC and PSC agree with our previous results, suggesting the robustness of our estimation.

Finally, as sectoral specialization may affect social capital and innovation, we split the sample into a sub-sample with the SMEs in the high-tech industries and another sub-sample with the SMEs in the low-tech industries. The classification of high-tech and low-tech industries follows OECD (2011). We estimate the effects of social capital on the performance the SMEs in two sub-samples. The results show that the effects are largely similar, thus, confirming our argument.<sup>17</sup>

## 7 Discussion and conclusions

We set out to study the effect of social capital on performance of SMEs in a transition economy. To frame our analysis, we base on the resourced-based theory of competitive advantage and the theories on social capital (Batjargal, 2010; Hernández-Carrión et al. 2017; Hughes et al., 2014). We distinguish between political and financial social capital. In this particular context of a transition economy where formal institutional frameworks are under-developed, we find that the relationship SMEs' owners/managers forge with key decision makers in their external environment are important. We find an inverted U-shaped relationship between political social capital and SMEs' performance. In addition, SMEs' performance increases with political social capital. If the level of political social capital is, however, too high, it is difficult for the SMEs to manage (Fan et al., 2007; Sheng et al., 2011). In other words, political social capital has positive effects on SMEs' performance up to its certain level, upon which a negative and decreasing effect sets in. We are able to identify the tipping points for political social capital and general social capital. The relationship between financial social capital and SMEs' performance only presents the increasing part of the inverted U-shaped curve. The positive effects of financial social capital on SMEs' performance are also up to a certain level (Alexy et al., 2012). Beyond that we do not find any harmful effects for SMEs' performance, which is opposite to Cole (1998) and Uzzi (1999).

An additional finding is about the moderating role of innovation on the relationship between social capital and SMEs' performance. We find a complementary effect between high levels of innovation and political social capital. This result might be explained by the fact that innovation increases the absorptive capacity of SMEs, which enables them to better utilize the value of external resources and knowledge. This finding is in agreement with previous studies that political social capital enhances SMEs' legitimacy and government protection in retaining

<sup>16</sup> We used the question "How many times per year did your networks assist in issues related to the operation of your firm?". Note that this question was not mentioned in the 2005 survey questionnaire.

<sup>17</sup> The estimation results will be provided upon request.



the benefits deriving from good technological competence or high levels of innovation (Li & Zhang, 2007). It is noted that for both innovative and non-innovative SMEs the relationship between political social capital and SMEs' performance has an inverted U-shaped pattern with the same level of peak values. Our results show a positive effect of financial social capital on SMEs' performance up to a certain level and then it disappears. In any case, it is found that innovation contributes to SMEs' performance and, thus, it is justified for financial institutions to provide SMEs with funding for innovation (Mateut, 2018).

From a theoretical point of view, this study makes several important contributions. First, it adds to the social capital literature by analyzing the role of social capital in a small business context (Hernández-Carrión et al. 2017) and testing the inverted U-shaped effects of social capital and the moderating effects of innovation on the performance of SMEs. The study adds to both social capital theory and resource-based theory of competitive advantage (Batjargal, 2010) by revealing the effects on SMEs' performance of both political and financial social capital. It highlights different impacts of different types social ties on SMEs' performance and, thus, is in line with other studies (Hernández-Carrión et al., 2017). This study further provides insights into the boundary conditions of social capital by analyzing the moderating role of innovation. Innovation provides SMEs with the prior knowledge and absorptive capacity required to evaluate, filter out, accept and understand the value of external resources acquired through social capital (Hughes et al., 2014). Overall, our study tests the theories developed in Western social environments on a sample of SMEs from a transition economy and, thus, contributing to the management research literature (Peng, 2003).

This paper has some important practical implications. In transition economies, owners/managers of SMEs should consider both political and financial social capital as valuable contextual resources for increasing their performance. They should be, however, aware that a too high level of social capital could have negative effects as maintaining it will become too costly. Our results confirm that innovation moderates the relationship between social capital and SMEs' performance, depending on types of social capital. Therefore, investing more in innovation is warranted for the SMEs to achieve better performance.

This study has implications for policy makers. As Hernández-Carrión et al. (2017) point out, public authorities are important for facilitating entrepreneurs' access to or contact with external actors. Organizing programs in which entrepreneurs, credit providers, and policy makers jointly participate, or creating formal associations to promote relational links among actors would enhance SMEs' performance. Moreover, these policies should be aimed at the SMEs that are active in conducting innovation. Relational links among actors and innovation policies should be complemented to assure better performance of the SMEs in transition economies. For example, a law on promotion of SMEs was promulgated in 2017 in Vietnam, which was aimed at providing SMEs with better access to finance, lower corporate income tax, and support for innovation. Such formal regulations have promoted the development of SMEs in Vietnam (Nam & Tram, 2021).

This study has some limitations. First, our analysis focuses on a single transition economy. Future research should be conducted in other economies with similar

settings to have full understanding of the relationship between social capital, innovation, and SMEs' performance. In particular, future work could examine the effect of social capital on performance by comparing developed and transition economies. Future work could analyze the effect of other forms of social capital on SMEs. The present study could be complemented by analyzing the three dimensions of social capital identified by Nahapiet and Ghoshal (1998), that is structural, relational, and cognitive social capital, in order to better understand which features of SMEs' networking activity (cohesion, relational orientation) improves access to useful resources. In addition, a sectoral study would allow identification of the degree to which social capital affects the performance of each type of business. Insights from such an analysis could improve entrepreneurs' decision making about how to work with the external actors in their environment.

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## Declarations

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