RESEARCH ARTICLE

# Small business investment: The importance of financing strategies and social networks

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**Abstract**

This study examines the association between financing strategies and firm investments. Employing theory of financing constraints and literature on formal/informal financing of small businesses to investigate a set of 15,851 observations of Vietnamese small businesses in 11 years, we suggest a pecking order of financing strategies in terms of firm investments, in ascending order as follows: (a) firms using no external finance, (b) firms using informal finance only, (c) firms using both formal and informal finance and (d) firms using formal finance only. In addition, we incorporate the theory of social capital to explore the moderating effect of networking on the relationship between financing and investment. Empirical results show that networks may enhance the relationship between informal finance and firm investments but not formal finance.

**KEYWORDS**

financing source, informal finance, investment, small business, social capital

## 1 | INTRODUCTION

Investment is important to small businesses. Firms that make investments may or may not grow. However, firms that make no investment achieve no sustainable growth and may even find it difficult to maintain their survival in such highly turbulent and competitive markets (Gupta, Barzotto, & Khorasgani, 2018). To finance investment projects, a firm basically has two financing options, that is, internal and external. Only when internal funds are insufficient, firms start seeking external debts to secure their investment opportunities (Myers, 1984). However, formal external finance (e.g., bank loans) is not always accessible, especially to small businesses in less developed economies because of issues related to market failures.[1] As such, informal finance, defined as small, unsecured and short-in-maturity funding capital in this

study, appears to be an important alternative (but less desired) financing source. Hoff and Stiglitz (1990) argue that the existence of informal loans is driven by imperfections in the formal credit markets: banks ration borrowers, and the informal sector serves those borrowers who are rationed out by banks.

These arguments from the literature lend support to four mutually exclusive financing strategies available to small businesses, namely (a) using no external finance; (b) using informal finance only; (c) using formal finance only and (d) using both formal and informal finance. In this study, we strive to explain the links between these four financing strategies and firm investment decisions. To be specific, the first research question to be examined is that: how do dissimilar financing strategies determine the values of investment in the context of small businesses?

It is important to understand the relationship between financing sources and firm investments because the recent literature has pointed out some counterfindings to the conventional pecking order theories of internal–external and formal–informal finance. For example, Nguyen (2019) argues that external finance may be more preferred to internal finance in insecure institutional environments with high risks of appropriation and corruption. In such a situation, entrepreneurs are inclined to direct their businesses' internally generated funds to safer investment channels (e.g., savings) and rely largely on borrowing to invest. Meanwhile, Guariglia, Liu, and Song (2011) suggest that in small business in China, thanks to their high productivity, their cash flow is so abundant that they are able to grow at a very fast rate, despite being discriminated against by local biased financial institutions. Hence, well-developed external capital markets may not always be needed for fast economic growth. In addition, Wu, Si, and Wu (2016) suggest that informal debt can be attractive to entrepreneurs because of its speed, subtle initial transaction fees and freedom from collateral requirements. As such, some firms may decide to finance their investments entirely by informal finance or by a combination of formal and informal finance instead of switching completely to formal finance even when they are eligible to do so.

These arguments evidently show the need to re-examine the relationship between firm financing strategies and firm investments. In addressing this issue, we notice that social capital, defined as the number of active contacts with business people, banking officials and local politicians, plays an essential role (Du, Guariglia, & Newman, 2015; Tran & Santarelli, 2014; Zhou, 2013). The reason is that underdeveloped and incomplete institutional environments in less developed countries force entrepreneurs to strategically build and maintain an active social network to gain access to resources required to secure their investments. Social networks exert a direct, non-financial effect on firm investments (e.g., providing additional information, business opportunities and collaboration opportunities) (Ko & Liu, 2017; Shu, Ren, & Zheng, 2018) and an indirect effect by moderating the relationship between financing and firm investments. While the direct effect of social capital is relatively well-understood, its indirect effect is less clear (Heikkila, Kalmi, & Ruuskanen, 2016), especially when examining its moderating effects on the relationship of a set of financing strategies and firm investments. As such, the second research question in this study is that: how does social capital influence firm investments by moderating the use of formal/informal finance?

We investigate the proposed research questions in the context of Vietnam, an ideal context for the following reasons. First, as a post-communist economy, Vietnam government still controls most of the key strategic resources, including financial markets and land use rights (Nguyen, Mickiewicz, & Du, 2018). Also, the institutional arrangements, including the financial systems of the country, remain biased heavily toward the state sector (Nguyen & van Dijk, 2012). As a result, entrepreneurs must dedicate to relationship building (social networking) to seek external financing for their ventures in such an environment. Second, Vietnam is an emerging economy characterized by the booming of the entrepreneurial sector (young and small private businesses). They are the key driver of the phenomenal economic transformation of the nation in the last decade (Santarelli & Tran, 2016). Therefore, it is essential to understand how they finance their investments in such an adverse institutional environment and the role of social networks in their financing strategies. Although a within-country research setting clearly sets a boundary condition to our findings, such a context of Vietnam allows us to identify the significance of financing strategies and social networking to the investment decisions of entrepreneurial firms, thereby making relevant implications.

We take advantage of the unique information in the Small and Medium Enterprise (SME) dataset conducted by the Central Institute for Economic Management (CIEM) of Vietnam. Specifically, we analyse more than 15,000 observations of small businesses in the period 2006–2018 to see how firm investment varies with different financing strategies as well as the role played by social networking in firm financing. To ensure the robustness of the findings, besides the conventional fixed-effects (FE) method, we also use bias-adjusted treatment effects technique and general method of moment (GMM) technique to reduce concerns with potential endogeneity-related issues in the empirical estimation.

Findings in this study propose a pecking order of firm financing strategies in terms of investment. Specifically, the pecking order in ascending investment values is as follows: (a) firms using no external finance, (b) firms using informal finance only, (c) firms using both formal and informal finance and (d) firms using formal finance only. We also find that social networks are able to enhance access to informal loans and boost firm investment subsequently. However, we observe no evidence showing that social networks, even networking with bank officials, improve access to formal debts. Finally, in a robustness test, we find that social networks are more relevant to registered firm investment than to household business investment.

## 2 | LITERATURE AND HYPOTHESES

### 2.1 | Financing sources and firm investments

While the link between financing sources and firm performance has recently attracted some research interest (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2010; Beck, Lu, & Yang, 2015; Du & Girma, 2012), the theoretical foundation that connects these two concepts is not clear and relatively hard to establish. The reason is that there are numerous mechanisms that play simultaneously. For example, one mechanism could be that each financing source is associated with different levels of monitoring and contract enforcement, creating dissimilar degrees of entrepreneurial commitment and inputs, hence influencing productivity and efficiency, and firm performance ultimately. Another mechanism, which is discussed in this paper, is the effects of alternative financing sources on the values of firm investment that subsequently also influence firm performance.

Our objective is to compare the investments of firms employing different sets of financing sources. The first pair of comparison is firms that use no external finance and firms that use informal finance. However, difficulty in comparing the investments of these two types of firms is that firms that use no external finance could be a sum of financially constrained firms and cash-abundant firms.[2] The former indicates firms whose internally generated funds are insufficient to support their investments and that they need external finance but fail to secure funding. The latter are companies whose internal funds are sufficient to support their investments and that they have no need to seek external finance.

If the number of cash-abundant firms dominates the population of firms using no external finance, it is arguably reasonable to expect that the group of firms using no external finance are less financially constrained than the group of firms that need to seek informal finance. As a consequence, firms using no external finance are more likely to make a higher investment than firms using informal finance, on average. However, extant research suggests that this scenario is less likely the representative in reality, especially in developing countries. In fact, the opposite hypothesis obtains more support from the literature that firms (which have no access to external finance as such) that use no external finance are more financially constrained than firms having access to informal loans (Lebiere & Anderson, 2011; Nguyen, 2019). Also, Carreira and Silva (2010) document some stylized empirical results on firms' financing constraints. One salient fact is that most young and small businesses are likely financially constrained because they have yet established sufficiently strong and trackable performance records, which raise significant informational asymmetry concerns for external lenders. For this reason, small firms that use no informal finance are likely to be financially constrained rather than to be cash-abundant.

In addition, small private businesses in less developed countries also encounter substantial institutional biases, which cause severe financial resource constraints (Allen, Qian, & Qian, 2005). For example, in Vietnam, Van Thang and Freeman (2009) evidently show that the greater the density of state-owned firms present in a region, the more they enjoy favouritism, the lower is the proportion of bank loans that go to private companies and the longer it takes for private firms to get access to land. While large companies can easily establish connections with local authorities/moneylenders to secure financial resources, small businesses can hardly join into this circle because they cannot afford transactions that are big enough to attract politicians/bank officials (Du & Mickiewicz, 2016). For this reason, only a fraction of small firms successfully obtains external loans (Heikkila et al., 2016); and the majority of them are likely to function in sub-optimal financing conditions (Kislat, 2015). For example, in the context of Vietnam, Rand (2007) using direct information from a Vietnamese enterprise survey shows that between 14 and 25% of the enterprises suffer from extreme credit constrained, and these enterprises would increase their debt holdings by between 40 and 115% if borrowing constraints were relaxed.

Moreover, Hayes and Allinson (1994) suggest that firms that use no external finance may suffer not only from financing constraints but also from cognitive financial constraints—a situation in which a firm does not obtain sufficient external funds to support its operations primarily because of entrepreneur's cognitive style (Lebiere & Anderson, 2011; Tyson, 2008). Specifically, it describes the state of mind of many entrepreneurs running small businesses that constrains them from requesting financial access, not because the funds are unnecessary or inaccessible, but rather because of their cognitive constraints. This type of entrepreneurship is found popular in both developed and developing countries, and they will not actively seek out external loans even if the financial constraint problems are mitigated (Fraser, Bhaumik, & Wright, 2015). Specifically, in the context of Vietnam, Nguyen and Canh (2020), analysing a sample of 2,500 Vietnamese SMEs from 2005 to 2015 evidently show that individuals with cognitive financial constraints originating from their background characteristics (i.e., minor ethnicities, females) are less likely to use external finance.

In general, evidence from the literature seems to suggest that small businesses that use no external finance may not obtain sufficient capital to fund their investment projects. Meanwhile, firms that successfully gain access to external loans, including loans from informal sources, may have overcome the cognitive constraints and have a larger room of finance to fund their desired investment projects. As such, we propose the following hypothesis:

**Hypothesis H1a** The investment values of firms gaining access to informal finance are higher than the investment values of firms having no access to external finance.

The second pair of comparison is firms that use informal finance and firms that use formal finance. Informal finance is of significant advantages like speedy and simple procedures, subtle initial transaction fees and freedom from collateral requirements (Wu et al., 2016). However, informal finance is small, unsecured and short-in-maturity funding capital, which may not satisfy firms with long-term and/or large-scale investment projects. Meanwhile, formal finance is the financing capital sourced from banks and other formal financial intermediaries. The key distinguishing characteristic between the two is that formal finance lending is processed based on hard information and arm-length principles while the decision of lending informal finance is processed using soft (private) information and relationship-based principles (Ayyagari et al., 2010; Nguyen, 2019).

Given this difference between the two, entrepreneurs face trade-offs in deciding the appropriate source of financing for their businesses. To maximize benefits from borrowing, small firms are keen to match investment projects to appropriate financing sources (O'Toole, Morgenroth, & Ha, 2016). To be specific, informal loans are more preferred for urgent, short-term and small-scale projects (e.g., to make up temporarily insufficient working capital) (Tsai, 2004). Meanwhile, formal (bank) loans, due to their lower interest rate associated with higher application costs, are more suitable to finance well-planned, long-term and large-scale investment projects (e.g., fixed-assets investments) (Ayyagari et al., 2010). Empirically, Barslund and Tarp (2008), examining a set of 932 rural household businesses in Vietnam, disclose that formal loans are almost employed for production and asset accumulation, while informal loans are used for consumption smoothening. Also, from the viewpoint of the specialization of the financial markets, Bao Duong and Izumida (2002) reveal that in Vietnam, the formal sector specializes in lending for production purposes, whereas the informal sector's lending is quite diverse but mostly associated with lower valued spending. Therefore,

it is expected that the values of investment projects funded by formal debts are typically larger than the values of investment projects funded by informal loans only. Put it formally, we have:

**Hypothesis H1b** The investment values of firms gaining access to formal finance are higher than the investment values of firms using informal finance only.

The next pair of comparison is firms that use formal finance and firms that use both formal and informal finance. To make such a comparison, we first need to clarify the relationship between formal and informal finance.

In fact, the extant literature offers different views on the relationship between the two sources. One view is that informal finance serves as the last resort for entrepreneurs that are quantity-rationed in the more desirable formal sector. This rationing may arise because formal lenders have limited information and thus rely on collaterals to overcome moral hazard and adverse selection intrinsic in credit transactions (Jain, 1999; Menkhoff, Neuberger, & Rungruxsirivorn, 2012). Firms that fail to provide sufficient collaterals are automatically screened out and are forced to find informal lenders, who are due to their informational advantages, and can substitute information-intensive screening and monitoring for collaterals (Guirkinger, 2008). The informational advantages of the informal sector (private moneylenders in particular) substantially reduce transaction costs which may drive the effective cost of informal loans below the effective cost of formal loans. However, the price (i.e., the interest rate) offered for the borrowers in the informal sector (private moneylenders in this case) is typically much higher than the price in the formal sector. Floro and Ray (1997) explain this phenomenon citing that the informal sector is regional; monopolistic or informal lenders are likely to engage in strategic cooperation, thus limiting competition.

In contrast to the 'last resort' view of informal finance, there is another view that the informal sector may also be preferred to the formal sector. Scholars supporting this view typically cite funding from family, friends and relatives as their research subjects. In the initial stage of the venturing or in urgent situations, these informal funding may act as seeding capital or speedy capital that satisfies entrepreneurs' need of capital with low costs and flexible repayment schedules (Elston, Chen, & Weidinger, 2016). In terms of private moneylenders, Boucher and Guirkinger (2007) argue that they have greater access to private information, enabling them to write contracts that are more state-contingent than formal contracts and thus are less risky for borrowers. As

such, entrepreneurs that are unwilling to assume the risk of a formal contract are inclined to seek informal finance.

Given these complementary/substitute viewpoints on the relationship between formal and informal finance, we suggest two possibilities. The first is that firms using formal finance invest more than firms using both formal and informal sources. This scenario is more likely when entrepreneurs consider formal finance is the most desired capital, and that they need to seek informal loans because a proportion of their formal applications is rationed out (Nguyen, 2019). On the contrary, another possibility is that firms using both sources of finance invest more than firms using formal finance only. This scenario is more likely when entrepreneurs consider informal loans are an additional financing option to boost their (different-sized) investment projects instead of relying completely on formal loans (Guirkinger, 2008). Based on this scenario, we propose the following hypothesis:

**Hypothesis H1c** The investment values of firms using both formal and informal finance are higher than the investment values of firms using formal finance only.

It is noteworthy that the opposite expectation that firms using formal finance invest more than firms using both formal and informal finance will also be tested. Since the extant literature remains mixed and fragmented, and there is no dominant theory that leads to a clear expectation from the two scenarios, we thus stay open to explore the investment values of these two types of firms.

If hypotheses H1a, H1b and H1c are supported, we are able to propose a pecking order of financing strategies in terms of firm investments. Specifically, the pecking order in ascending investment values is as follows: (a) firms using no external finance, (b) firms using informal finance only, (c) firms using formal finance only and (d) firms using both formal and informal finance.

## 2.2 | Social capital and firm investment

'Social capital is defined as the structure of informal social relationships conducive to developing cooperation among economic actors aimed at increasing social product, which is expected to accrue to the group of people embedded in those social relationships'. (Hayami, 2009, p. 98)

This definition of social capital implies the role of social relationships forged through informal organizations, which could be horizontal (e.g., sports clubs) or

hierarchical (e.g., family members). These relations are informal in the sense that they are not enforced by the state's coercive power. And by social product, the idea is to indicate the total value added from the use of social capital. One of the key distinctions between human capital and social capital is that the former is owned and used individually, whereas the latter is owned and used jointly (Santarelli & Tran, 2013). As such, the faithful fulfilment of the agreed-upon obligation (i.e., trust) is considered to be an investment by network members in maintaining social capital (Hayami, 2009; Zhan, 2012).

Social networking (*Quanhe*) as a business practice is essential in Vietnam. *Quanhe* is an equivalent terminology of Chinese *Guanxi*, which has more or less the same meaning.[3] The root of *Quanhe*, according to Dell, Lane, and Querubin (2018), was established in the Sinic historical stage, which was heavily influenced by Chinese statecraft. Specifically, in this period, Daiviet (former name of Vietnam) citizens were ruled by a strong, centralized state in which the village was the fundamental social and administrative unit, leading to the establishment of 'group identification Daiviet was governed by China during the first millennium CE, and it maintained many features of the Chinese state following independence' (Meyer & Nguyen, 2005).

Quanhe, as a net of social networks, is found to exert an important role in boosting firm investments (Bi & Wang, 2018). There are two potential mechanisms leading to such a positive association, one is the direct, nonfinancial effects and the other one is the financial effects of social capital.

Concerning the non-financial effects, Cassar (2014) argues that having frequently interacted with others in the same industries would help entrepreneurs update the newest trends in their markets, including both material markets and product markets. By exchanging information, entrepreneurs are able to build up a broader and more complete picture of opportunities (e.g., new technology) and threats (e.g., new entrants) in their business environments, which then enable them to pursue a more informed and timely investment strategy (De Carolis & Saparito, 2006). In the context of Vietnam, Hanh Tien Thi and Tri Minh (2020) examine a sample of 153 Vietnamese firms and show that social capital is positively related to firm performance with knowledge transfer and innovation acting as mediators. They also evidently demonstrate that knowledge transfer and the company's innovation are found to have a strong association with each other.

In addition, a strong network associated with a high level of trust may facilitate collaborative investments among its members (Lai Xuan & Truong, 2005). In joint ventures built on strong trust and mutual reliance, each

party is likely to invest their most competitive resources/advantages (e.g., knowhow) to increase the likelihood of survival of the joint ventures, leading to higher value-added and larger investment projects (Makino & Tsang, 2011).

In addition to the external benefits, a wider and stronger social network also benefits firm investments by facilitating entrepreneurial innovation. Baron (2007) suggests that being exposed to new information is of important effects in improving patterns recognition ability. Entrepreneurs who have a diversified networking background and experience are likely to come up with more innovative ideas and plausible solutions. The reason is that a diversified pool of information from different sources allows ones to discover and connect meaningful events which appear seemingly irrelevant to people with less diversified social connections (Hsieh, 2016). For example, Nguyen et al. (2018) examines a set of Vietnamese SMEs (mostly household businesses) and find that entrepreneurs who have wider social networks obtained from the previous entrepreneurial activities make more investments into their current ventures compared to first-time entrepreneurs with no business network.

For these reasons, it is arguably reasonable to expect that social capital, by providing small businesses with valuable information, business opportunities and collaboration opportunities, is positively associated with firm investments. A hypothesis built upon these arguments is hardly new in the extant literature. As such, we keep the test on the direct, non-financial association between social networks and firm investments in this study as a confirmation test only.

## 2.3 | Social capital and financing sources

Besides the direct, non-financial association, social capital may boost firm investments by improving access to external loans, thus reducing the adverse effects of financing constraints on firm investments.

In terms of informal finance, Heikkila et al. (2016) elaborate on the importance of relationship in gaining access to external finance to argue that an individual's social connections may affect access to credit through two partly overlapping channels: social connections to loan officers and the need to find guarantors for the loan. Since stronger and wider bonding social networks reduce informational asymmetries, a person with more social capital is indeed perceived to form a lower credit risk and thus likely to obtain better credit access (Burt, 2007). This strand of argument is endorsed by Chua, Chrisman, Kellermanns, and Wu (2011) who argue that entrepreneurs must either use their personal capital or if personal

capital is lacking or insufficient, make use of other people's social capital to successfully obtain external finance. As such, they propose that family involvement increases a venture's ability to borrow family social capital for the purpose of obtaining debts. Meanwhile, Menkhoff et al. (2012) investigate the financing of Thai small businesses and suggest that most informal loans do not include any tangible assets as collaterals. Instead, lenders enforce collateral-free loans through third-party guarantees and relationship lending. In the context of Vietnam, McMillan and Woodruff (1999) examine relational contracting and find that a firm trusts its customer enough to offer credit when the customer finds it hard to locate an alternative supplier. A longer duration of trading relationship is associated with larger credit, as is prior information gathering. This strand of literature thus highlights the importance of social capital in accessing informal finance.

Moreover, a strong and binding network reduces asymmetric information and helps establish calculative trust among its members. Therefore, an entrepreneur, when successfully signals other ties in the network that he/she is competent, may obtain corresponding favours (e.g., a better trade credit scheme), which may then be used to finance (a proportion of) new investment projects (Casey & O'Toole, 2014; Cull, Xu, & Zhu, 2009). Trade credit and reciprocal financial supports from local business communities are important to small businesses' investments, especially those operating in developing countries because of their underdeveloped financial institutions (Cull et al., 2009). Without such a system of networking and mutual trust, the flow of informal finance among small businesses would not have been successfully activated. For these reasons, we propose the following hypothesis:

**Hypothesis H2a** The larger the networks associated with a firm, the more positive the relationship between informal finance and firm investments.

In terms of formal finance, Nguyen, Le, and Freeman (2006) show that in the absence of effective market institutions and business data, banks in Vietnam face considerable uncertainties (rather than risks) in lending to private small businesses. Consequently, banks employ a combination of uncertainty avoidance, and reliance on trust, in lending to their business clients. Given that access to finance is crucial to making investments and fostering growth, maintaining strong ties with bank officials appears to be a wise networking strategy. This argument is confirmed by Du et al. (2015) who demonstrate that small businesses can improve access to (short-term) bank loans by adopting strategies aimed at building social capital, namely entertaining and gift-giving to bank officials in their social networks.

In addition, it is noteworthy that the banking systems in less developed countries are monopolistically controlled by the states (Nguyen, Nghiem, Roca, & Sharma, 2016; Saez, 2001). In such a weak and incomplete institutional system (both formal and informal institutions), bank officials, empowered by substantial freedom from making lending decisions, are keen to favour relationship-based instead of arms-length principles of transactions with an aim to seek private rents (Gjalt, Tu, & Hans, 2012). In such a situation, networks can serve as a means to reduce transaction costs for bank officials. They are keen to make lending transactions with firms that are 'in the circle'—that is, having a well-established connection with them. The reason is that bank officials face time and attention constraints, hence routine transactions are perceived cost-saving and safer to extract rents and thus are prioritized (Du & Mickiewicz, 2016).

Not only transaction costs but agency costs are substantially reduced by social capital. To be specific, networking serves as a mechanism of 'information transfer' in which firms can convey information about their reliability and creditworthiness to bank officials (Zhan, 2012). This should enable bank officials to build up a better picture of the financial and operating situations of the firms, leading to a reduction in informational asymmetries and a greater willingness to forward credit. For example, Le and Nguyen (2009) show that in the context of Vietnamese SMEs, networking with customers and government officials promotes the use of bank loans. This finding is recently re-confirmed by Pham and Talavera (2018) who investigate another set of Vietnamese SMEs and find that social capital could facilitate loan applications: firms that have a closer relationship with government officials and other business people can get loans of longer duration.

For these reasons, firms with more social capital are less financially constrained and are more likely to successfully secure their investment projects. Therefore, we propose the following hypothesis:

**Hypothesis H2b** The larger the networks associated with a firm, the more positive the relationship between formal finance and firm investments.

## 3 | DATA AND METHODS

### 3.1 | Data

To test the proposed hypotheses, this study employs the Small and Medium Enterprise (SME) dataset published by the Central Institute for Economic Management (CIEM) of Vietnam. This dataset is obtained through a collaboration of CIEM with two other institutions, namely the Institute of Labor Science and Affairs of Vietnam (ILSAA) and the Development Economics Research Group (DERG) of Copenhagen University.

The SME survey covers information on several operational aspects of small ventures in Vietnam, including their production, sales structure, investment and employment. In addition to formally registered enterprises, the survey also samples a substantial number of micro-household businesses to gain a comprehensive understanding of firm dynamics in Vietnam, where the informal sector is particularly relevant (Carbonara, Santarelli, & Tran, 2016). In addition to venture information, household characteristics of the owner-managers and their social network information are also extensively surveyed. The first full investigation was conducted in 2005 and has been carried out every 2 years thereafter. Approximately, 2,800 small businesses in 10 provinces across Vietnam are randomly selected to participate in each survey. In this study, we employ the dataset over an 11-year period, from 2005 to 2015 (six surveys in total).

It is noteworthy that this is an unbalanced panel as some firms may exit and other new firms may join into the surveys. The survey sample was drawn randomly using the stratified sampling technique to ensure that an adequate number of businesses with different ownership structures was included for each province. We thus have micro firms (the majority), private firms, partnerships, cooperatives, limited liability companies and joint-stock companies. For a comprehensive understanding of the survey, see Rand and Tarp (2007). The SME dataset is unbalanced and thus requires cleaning before using. Specifically, firms with no identification code and non-meaningful accounting information were dropped.[4] Moreover, the outliers are controlled for by censoring the top and bottom 1% of observations in each variable, leaving a final sample of 15,851 firm-year observations, covering 3,715 small businesses.

### 3.2 | Variables and measures

#### 3.2.1 | Firm investments

The primary dependent variable in this study is firm investments, measured by investment variable, which is the ratio of a firm's investment value to its total capital over a period of 2 years (due to the survey settings).

#### 3.2.2 | Financing sources

The primary independent variable is a set of firm financing strategies. We identify four mutually exclusive

financing strategies using the following two questions in the survey: 'Has your firm borrowed from banks or other formal credit institutions since the last survey'? and 'Has your firm borrowed from informal sources including private moneylenders, relatives and friends to owners and other enterprises since the last survey'?

Firms that answer 'no' to both questions are coded 0, firms that use informal finance only are coded 1, firms that use formal finance only are coded 2 and firms that answer 'yes' to both questions are coded 3. As such, we have a categorical variable with four potential outcomes: (a) No external finance, (b) informal finance only, (c) formal finance only and (d) both formal and informal finance. It is noteworthy that the four dummy variables are mutually exclusive.

### 3.2.3 | Social networks

We measure the levels of effectiveness of social capital using the number of network ties that an entrepreneur is effectively connected with. Specifically, we make use of the following item in the questionnaire: 'approximately, with how many people do you currently (presently) have regular contact?[5] in each of the following categories: (a) Business people in the same sector (same product as the reported industry codes); (b) other business people in a different sector; (c) bank officials (including both formal and informal creditors) ans (d) politicians and civil servants'.

As such, the survey provides information on three types of social ties, namely business-specific networks, financing-specific networks and political-specific networks. We construct a variable named social networks, which is the sum of all social ties in these categories to test the general effect of social capital on firm investments. In the robustness check, we also examine the effects of each type of networks in details.

### 3.2.4 | Control variables

The model also controls for covariates that may influence firm investments. At the firm level, it includes conventional variables such as firm age, firm size, industry and types of ownership. These variables represent the firm-specific characteristics that significantly determine the rate, value and frequency of investments (Nguyen, 2019). Besides that, we also control for entrepreneurial-oriented activities including exporting and innovating. The extant literature suggests that entrepreneurial-oriented firms are more likely to seek external finance to make larger and higher value-added investment projects (Anderson,

Kreiser, Kuratko, Hornsby, & Eshima, 2015). Next, a variable indicating firm membership status in local industry associations is included to take into account the possibility that member firms may invest more than non-member firms due to associations' provided subsidies (Zhou, 2013). Also at the firm level, we control for the level of liabilities (the ratio of liability values over total assets), which are proven as a key determinant of investment decisions (both formal and informal) (Du et al., 2015).

At the entrepreneurs' individual level, the model includes entrepreneurs' gender and age as control variables. These individual-specific factors play an essential role in investment decisions because they indicate the patterns of cognitive styles of entrepreneurs, which may remarkably influence their ability to recognize and evaluate business opportunities (Hayes & Allinson, 1998; Riding, 1997). Moreover, individuals' previous start-up experience and education may also affect their ability to recognize business opportunities (Arte, 2017; Nguyen, 2018). Therefore, the model also controls for entrepreneur start-up experience and educational background, which are measured by a set of mutually exclusive dummy variables.

Finally, at the regional level, the model controls for time-variant provincial consumption power. Firms located in provinces with stronger consumption power, measured as the average consumption value per capita, may invest more than firms located in provinces with weaker consumption power (Nguyen et al., 2018). We also control for time-invariant unobservable provincial characteristics using a set of corresponding provincial dummy variables.

We acknowledge that it is important to control for investment opportunities in an investment equation. Conventionally, sales revenues were employed as a proxy for investment opportunities (Guariglia et al., 2011). Unfortunately, in this study, we do not have sale-related variables. As such, we take into account the effects of investment opportunities on investment decisions indirectly using variables such as export, innovation and provincial consumption. Firms would not export or conduct innovative projects if they did not observe sufficient opportunities. Also, firms located in provinces with stronger consumption power may find more investment opportunities as well.

Variable definitions and summary statistics are reported in Table 1. The correlation matrix is reported in Appendix A (Table A1). On average, Vietnamese small businesses invest more than 10% of total capital per year in the study period. In terms of financing strategies, 34.4% of sampled firms use no external finance, 33.2% use informal loans, 12.2% use formal debts and 20.2% use

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**TABLE 1** Variable definition and summary statistics

| Variable | Definition | M | SD | Min | Max |
|---|---|---|---|---|---|
| Investment | Ratio of firm investment value over total capital | 0.103 | 0.206 | 0 | 1.308 |
| No external finance | Take value 1 if firms did not use external finance in the last 2 years and 0 otherwise | 0.344 | 0.475 | 0 | 1 |
| Informal finance | Take value 1 if firms use informal finance only in the last 2 years and 0 otherwise | 0.332 | 0.471 | 0 | 1 |
| Formal finance | Take value 1 if firms use formal finance only in the last 2 years and 0 otherwise | 0.122 | 0.327 | 0 | 1 |
| Both financing sources | Take value 1 if firms use both formal and informal financing sources in the last 2 years and 0 otherwise | 0.202 | 0.402 | 0 | 1 |
| Social networks | A count variable, indicating the number people that an entrepreneur currently has regular contact with in the following four areas: (a) business people in the same sector, (b) business people in other sectors; (c) bank officials, including both formal and informal creditors and (d) politicians and civil servants | 32.512 | 30.470 | 1 | 203 |
| Owner gender | A dummy variable, which takes value 0 for female and value 1 for male | 0.640 | 0.480 | 0 | 1 |
| Owner age | Age of the business owners | 45.652 | 10.481 | 25 | 73 |
| Start-up experience | A dummy variable, which takes value 0 if the current business is the first venture and value 1 if the current business is not the first one | 0.026 | 0.158 | 0 | 1 |
| Owner education | A categorical variable, taking value 1 for doctoral degrees, 2 for masters, 3 for bachelors, 4 for college degrees, 5 for professional vocational degrees, 6 for senior technical degrees, 7 for junior technical degrees and 8 for no degree | 3.149 | 1.856 | 1 | 8 |
| Firm age | Number of years since firm establishment | 19.087 | 12.857 | 3 | 86 |
| Firm size | A continuous variable, which is the natural log of the number of employees (reported here the number of employees) | 16.504 | 30.514 | 1 | 199 |
| Export | A dummy variable, which takes value 0 if firms did not export and value 1 if firms have done exports since the last survey | 0.062 | 0.241 | 0 | 1 |
| Innovation | A dummy variable, which takes value 1 if firms introduced new products, or improved current products, or changed production process, and 0 if firms did not do any of these innovations over the last 2 years | 0.375 | 0.484 | 0 | 1 |
| Association | A dummy variable with value 0 if firms do not join any local industry association, and value 1 if firms hold membership in at least one association | 0.233 | 0.423 | 0 | 1 |
| Liability | The ratio of liability over total assets | 0.096 | 0.189 | 0 | 1.078 |
| Province consumption | The value of average consumption of a province in a year depreciated to 2010 value, in million VND per capita | 27.553 | 22.841 | 2.451 | 89.120 |
| Household business | Takes value 1 for household business and 0 otherwise | 0.653 | 0.476 | 0 | 1 |
| Sole proprietorship | Takes value 1 for sole proprietorship business and 0 otherwise | 0.081 | 0.273 | 0 | 1 |
| Partnership | Takes value 1 for partnership business and 0 otherwise | 0.003 | 0.052 | 0 | 1 |
| Cooperative | Takes value 1 for cooperative business and 0 otherwise | 0.028 | 0.164 | 0 | 1 |
| Limited liability company (LLC) | Take values 1 for LLC and 0 otherwise | 0.199 | 0.400 | 0 | 1 |
| Joint stock company (JSC) | Take values 1 for JSC and 0 otherwise | 0.003 | 0.051 | 0 | 1 |
| Joint venture with foreign capital | Takes value 1 for joint venture with foreign capital business and 0 otherwise | 0.033 | 0.180 | 0 | 1 |

*Note:* The statistics are provided for 15,851 firm-year observations from 2005 to 2015. The data source is the SME dataset published by the Central Institute for Economic Management (CIEM) of Vietnam.

both financing sources. These statistics indicate that a large number of small businesses (67.6%) in Vietnam still have no access to formal finance, which may be a signal of financing constraints. In terms of social networks, on average each entrepreneur in Vietnam has 32.5 active connections with business people, banking officials or local politicians.

## 3.3 | Specification and estimation

Following the extant literature on small business investment (Nguyen, 2019; Zhou, 2017), we propose the following reduced-form investment equation:

$$
\begin{aligned}
\text{Investment}_{igt} = \beta_0 &+ \beta_1 \Big( \text{Financing sources}_{igt} \Big) \\
&+ \beta_2 \Big( \text{Social networks}_{igt} \Big) \\
+ \beta_3 \Big( \text{Control variables}_{igt} \Big) &+ v_t + v_j + v_g + v_i + \mu_{it}
\end{aligned}
$$

where $i$ denotes an individual business, $g$ is a province and $t$ a year. As such, Investment$_{igt}$ is the investment value of firm $i$ in province $g$ in year $t$. The term Financing sources$_{igt}$ is a column vector of four financing strategies: (a) use no external finance, (b) use informal finance only, (c) use formal finance only and (d) use both formal and informal finance. The term Social networks$_{igt}$ is the total number of business-specific networks, financing-specific networks and political-specific networks associated with a business. Then, we also test the effect of each respective type of networks on firm investments. The term Control variables$_{igt}$ comprises a set of covariates at individual level, firm level and regional level that may influence firm investments.

We are interested in the coefficients $\beta_1$ and $\beta_2$ as they indicate the association between financing/networking strategies and firm investments. We, moreover, aim to explore the moderating effects of social capital on the relationship between financing sources and investments. As such, based on the benchmark specification, we add an interaction term Financing sources$_{igt}$ × Social networks$_{igt}$.

The investment function also includes a time-specific component $v_t$, accounting for macro-business cycle effects; an industry-specific characteristics $v_j$ and time-invariant provincial characteristics $v_g$, which are controlled by the corresponding dummy variables. Firm-specific time-invariant characteristics are captured in $v_i$. This study controls for this component by estimating the equation using a fixed-effects technique. The fixed-effects estimator could deal, to some extent, with unobservable heterogeneity and potential endogeneity of missing

(time-invariant firm-specific) variables in the model. Also, to reduce concerns of endogeneity, all variables that may suffer from reverse effects are lagged 1 year. They include firm size, export, innovation, association, liability, financing sources and social networks. Finally, $\mu_{it}$ is the idiosyncratic component of the error.

## 4 | RESULTS

### 4.1 | Main results

Regression results are presented in Table 2. The specification tests indicate no serious issues with the modelling. We also test multicollinearity among the regressors using variance inflation factor (VIF) test and find no evidence of its presence. Columns 1 and 2 show the results of financing sources and social networks separately. Columns 3 and 4 show the results of both variables entered the equation simultaneously. The group of firms that use no external finance serves as the benchmark.

The coefficients associated with financing sources, including using informal finance only, using formal finance only and using both sources of finance are positive and statistically significant. This finding initially indicates that firms using external finance invest significantly more than firms using no external finance.

To compare the investment between pairs of financing sources, we conduct a set of Wald tests. The test statistics (presented at the end of each column) confirm that firms using formal finance invest more than firms using informal finance. However, firms using both sources of finance invest *less* than firms using formal finance only. As such, hypothesis H1a and H1b are supported. However, hypothesis H1c is not supported. This finding thus implies that entrepreneurs treat informal finance as less desired alternative funding to formal finance.

In terms of the moderating effects of social capital on the relationship between financing sources and firm investments, column 4 shows that the coefficients associated with the interaction term between informal finance and social networks and the interaction term between both sources of finance and social networks are positive and statistically significant. Meanwhile, the coefficient associated with the interaction term between formal finance and social networks is insignificant. This finding thus implies that social capital is able to boost firm investment by improving access to informal loans but not formal debts. As such, hypothesis H2a is supported, and hypothesis H2b is not supported.

Finally, the coefficients associated with the control variables also reveal some interesting investment

**TABLE 2** Regression results

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Informal finance | 2.834*** (0.413) | | 2.805*** (0.413) | 1.970*** (0.568) |
| Formal finance | 15.519*** (1.014) | | 15.529*** (1.015) | 15.080*** (1.381) |
| Both financing sources | 14.948*** (0.738) | | 14.907*** (0.737) | 12.406*** (1.025) |
| Social networks | | 0.016** (0.008) | 0.013* (0.007) | −0.017 (0.011) |
| Informal finance × social networks | | | | 0.029* (0.015) |
| Formal finance × social networks | | | | 0.016 (0.030) |
| Both financing sources × social networks | | | | 0.073*** (0.023) |
| Owner gender | −0.394 (0.597) | −1.000 (0.622) | −0.399 (0.597) | −0.407 (0.598) |
| Owner age | −0.034 (0.039) | −0.032 (0.040) | −0.035 (0.039) | −0.037 (0.039) |
| Start-up experience | 1.213 (1.455) | 1.308 (1.510) | 1.190 (1.458) | 1.075 (1.462) |
| Owner education | −0.163 (0.184) | −0.143 (0.193) | −0.163 (0.184) | −0.140 (0.184) |
| Firm age | 1.310*** (0.150) | 1.079*** (0.155) | 1.317*** (0.150) | 1.300*** (0.150) |
| Firm size | −0.678 (0.554) | −0.685 (0.572) | −0.677 (0.555) | −0.601 (0.555) |
| Export | −1.804 (1.723) | −1.687 (1.752) | −1.819 (1.723) | −1.863 (1.722) |
| Innovation | −0.395 (0.459) | −0.460 (0.484) | −0.399 (0.459) | −0.408 (0.460) |
| Association | 3.822*** (1.098) | 4.838*** (1.137) | 3.752*** (1.097) | 3.606*** (1.095) |
| Liability | −6.541*** (2.068) | −7.383*** (2.170) | −6.584*** (2.069) | −6.600*** (2.067) |
| Province consumption | −0.127*** (0.028) | −0.147*** (0.030) | −0.131*** (0.028) | −0.123*** (0.028) |
| Observations | 15,851 | 15,851 | 15,851 | 15,851 |
| Number of firms | 3,715 | 3,715 | 3,715 | 3,715 |
| VIF | 2.743 | 3.034 | 3.287 | 4.982 |
| $R^2$ | 0.479 | 0.425 | 0.479 | 0.480 |
| Adjusted $R^2$ | 0.274 | 0.200 | 0.274 | 0.278 |
| Wald test informal finance = formal finance | 156.65 | | 61.53 | 90.68 |
| *p* value | .00 | | .00 | .00 |
| Wald test formal finance = both financing sources | 3.46 | | 5.30 | 5.07 |
| *p* value | .06 | | .02 | .02 |

*Note:* The dependent variable is firm investment. Firms using no external finance serve as the benchmark financing source. All estimations include full sets of two-digit industry dummies, 10 provincial dummies and 6-year dummies. *SE* and test statistics are asymptotically robust to heteroscedasticity. Variables firm size, export, innovation, association, liability, financing sources and social networks are lagged one period. VIF is variance inflation factor test for multicollinearity. Wald test informal finance = Formal finance under the null that the coefficient associated with informal finance variable is equal to the coefficient associated with formal finance variable. Wald test formal finance = both financing sources under the null that the coefficient associated with formal finance variable is equal to the coefficient associated with both financing source. *indicates significant at 10%, **indicates significant at 5%, and ***indicates significant at 1%.

patterns. Older firms make more investments than their younger counterparts. This could be attributed to reduced informational asymmetries when firms grow up. Also, firms holding membership in local industry associations invest more, confirming the importance of knowledge spillover and in funding investment projects using external finance. However, liability seems to discourage firm investments. This could be due to the requirement from the creditors on high-debt firms that restrict them from pursuing risky activities (i.e., making investments).

## 4.2 | Robustness tests

### 4.2.1 | Household business vs registered business

The sample of small businesses under investigation in this study includes both household micro-businesses and registered businesses. Specifically, 65.29% of the sampled observations are household businesses, while the rest 34.71% are registered firms. These two types of firms may be different in their access to finance as

well as networking activities. For example, micro-household businesses, compared to formally registered firms, may be more constrained in accessing to formal finance such as bank loans as their natures of no official records of accounting numbers and small scale of economic activities (Elston et al., 2016). Also, the networking activities of household businesses may also be very limited due to their smallness and unprofessionalism (Nguyen & Nordman, 2018). The regression results on the two samples are presented in Appendix A (Table A2).

The results show that both formal and informal finance are important to firm investment, regardless of their legal forms. However, the effect of formal finance is much stronger than the effect of informal finance. These findings are consistent with the main results on the total sample. Interestingly, it is found that while social networks are important to registered firm investment, they appear irrelevant to household business investment. This could be explained by the fact that household businesses, due to their non-professional management, may not utilize their business networks efficiently, leading to limited social capital extracted from the embedded networks (Nguyen & Nordman, 2018). Also, their smallness in economic activities may restrict them from making connections with key resource holders (e.g., higher level of local authorities) (Du & Mickiewicz, 2016). For these reasons, there is little correlation between networking and firm investment in household businesses. Meanwhile, registered firms may strategically manage their social networks with an aim of increasing access to external resources. Also, they may actively engage in political relationship building and extract benefits from such an activity.

Turning to the interaction terms between financing sources and social networks, it is found that networking has no effect on access to formal finance in both sub-samples. This finding is consistent with the main results on the total sample. However, social networks may help registered firms improve access to informal finance. This effect is not found in household businesses. Once again, this could be explained by the smallness in economic activities and unprofessional management of household firms (Nguyen & Nordman, 2018). These characteristics fail to enable lenders to build up a better picture of the financial and operating situations of the firms, leading to significant informational asymmetries and a reluctance to forward credit. Meanwhile, registered businesses, thanks to their formal legal forms and professional management, may find it easier to build relationship with lenders and obtain informal credit.

### 4.2.2 | Four types of social networks

We also examine the effect of each type of social networks and the regression results are reported in Appendix A (Table A3). The coefficients associated with the four types of social networks are mostly insignificant or even negative in the interaction specification. This could be a result of multicollinearity due to the presence of the interaction terms. However, the coefficients associated with the interaction terms between informal finance and social networks and the interactions terms between both sources of finance and social networks are statistically significant in some specifications. Meanwhile, the coefficients associated with the interaction terms between formal finance and social networks are not significant in any specification. These findings as such provide some (weak) evidence that supports our proposed hypotheses.

### 4.2.3 | Endogenous networking

We acknowledge that the regression results presented in previous sections may suffer from endogeneity-related issues. For example, firms with stronger social network have higher investment, but when firms make higher investment, they have more chance to increase social network through the investment implications. Also, even though we controlled for several relevant covariates, there may be a chance that the empirical setting encounters omitted-variable biases.

Therefore in this section, we employ the method proposed by (Oster, 2019), derived from the work of Altonji, Elder, and Taber (2005), to calculate a set of consistent estimates of the bias-adjusted treatment effects. This method is based on two assumptions: (1) a value for the relative degree of selection on observed and unobserved variables $\delta$ (normally assumed to be equal selection, that is, $\delta = 1$) and a value for $R_{\max} - R^2$ obtained from a hypothetical regression of the outcome on treatment and on both the observed and unobserved controls.[6] Using these two inputs, an approximation of the bias-adjusted treatment effect may be estimated through an examination of the ratio of the movement in the regression coefficients in relation to the ratio of the movement in $R^2$.

The networking variables in the main specification and the two sub-samples will be explored. Appendix A (Table A4) presents the estimation results. Column (1) shows the regression coefficients without controls (baseline effect). Column (2) shows the regression coefficients with observable controls (controlled effect). Column (3) presents the bias-adjusted treatment effect with the assumptions that $\delta = 1$, and $R_{\max} = \tilde{R} + (\tilde{R} - \dot{R})$, in

which $\tilde{R}$ is $R^2$ obtained from the controlled specification and $\dot{R}$ is the $R^2$ obtained from the baseline specification (Bellows & Miguel, 2009). Column (4) presents the bias-adjusted treatment effect with the assumptions $\delta = 1$, and $R_{max} = 1.3\tilde{R}$.[7] Column (5) presents the value of $\delta$ for which the treatment effect becomes zero under the assumption that $R_{max} = 1.3\tilde{R}$. To facilitate the calculation of the non-biased treatment effects, we estimate the coefficients in columns (1) and (2) using fixed effects.

The results show that the bias-adjusted coefficients are all positive in total sample and in the sub-sample of registered firms. However, testing 'social networks has no effects on household business investment' generates a value smaller than 1 for $\delta$. This is a signal that the distribution of the bias-adjusted treatment effect of the variable includes value zero. This is consistent with the finding using regression methods showing that social networks are irrelevant to household business investment while they are positively associated with registered firm investment.

## 4.2.4 | GMM estimation

In addition to the fixed effect, we also employ the system general method of moment (GMM) to estimate the regression coefficients. The GMM approach could deal, to some extent, with potential endogeneity in our model by using the lagged terms of the endogenous variables as valid instrumental variables. Specifically, in the difference equations, we use the lagged 3- to 5-year terms to instrument the endogenous variables. The specification tests suggest that this length of lag is sufficiently deep to reduce the correlation between endogenous variables and the error terms, at the same time, to remain relevant to the current terms of the endogenous variables (to be valid instrumental variables). The system GMM, moreover, corrects any possible finite sample bias by omitting informative moment conditions using differences as instruments for level equations. In level equations, we use the difference of endogenous variables lagged 2–4 years as valid instruments. The regression results using GMM are reported in Appendix A (Table A5) and in general consistent with our key arguments.

## 5 | DISCUSSION AND CONCLUSION

Investment is important to small businesses. However, facing severe financing constraints, small businesses can hardly satisfy their investment using only internally generated funds. As such, access to external loans is an important determinant of investment decisions. This study investigates the association between different financing sources and investments of small businesses in Vietnam. Using a panel dataset of 3,715 small businesses in 11 years (2005–2015), we offer the initial empirical evidence that firm investment is a function of financing sources. To be specific, we propose a pecking order of financing sources in terms of investment. The pecking order in ascending investment values is as follows: (a) firms using no external finance, (b) firms using informal finance only, (c) firms using both formal and informal finance and (d) firms using formal finance only.

We further observe that social capital is of essential influence on firm investments. Its impacts are channelled through two mechanisms. One is the direct, non-financial effect on firm investments (e.g., providing additional information, business opportunities and collaboration opportunities). The other mechanism is the indirect effect by moderating the relationship between financing and firm investments. Interestingly, we find that social networks are able to enhance access to informal loans and boost firm investment subsequently. We observe no evidence showing that social networks, even networking with bank officials, improve access to formal debts. In other words, firms with more social networks are not statistically different from firms with less social networks in terms of successfully securing formal (bank) loans.

This finding stands in sharp contrast to the majority of the extant research in small business management and entrepreneurship. For example, Du et al. (2015) examine the extent to which Chinese firms can improve access to external debts by adopting strategies aimed at building social capital, namely entertaining and gift-giving to others in their social network. They find that entertainment and gift-giving expenditure lead to higher levels of total and short-term debt (but not long-term debt). Bank officers are exposed to higher levels of uncertainty in long-term debt transactions as these loans are typically larger in terms of value and longer in terms of the maturity period. For this reason, social capital is insufficient to protect bank officials from potential hold-ups or information asymmetries occur after lending. This could be an explanation for the insignificant moderating effect of social capital on the relationship between formal loans and firm investments.

This study sheds light on the debate about the relationship between formal and informal finance. This relationship has drawn substantial research but remains elusive. Some studies propose a peeking-order relationship between the two, in which firms will switch from informal to formal finance as long as they are eligible to do so (Lee & Persson, 2016; Rahaman, 2011). The reason is that formal loans are more stable, secure and cheaper

than informal loans. Meanwhile, other studies argue for a complementary relationship between formal and informal finance because a combination of both financing sources may best support firm diverse investment projects, in which some projects are more suitable for informal rather than formal debts (Kislat, 2015; Steel, Aryeetey, Hettige, & Nissanke, 1997). In this study, instead of simply examining the relationship between the two, we propose and find evidence for a pecking order of a set of financing strategies built on different combinations of the two sources. Specifically, we propose that formal finance is the most desired financing source. However, firms do not completely switch from informal loans to formal debts when they are able to do so, but they need a transition period in which both sources of finance are employed to make investments.

Moreover, this study also provides an initial understanding of the role of networks in the process of financing investment projects. We propose that on top of the direct, non-financial effect of social capital on firm investments, there is another indirect effect of networks on firm investments, that is, the moderating effect on access to external finance. As such, this study adds to the discussion on the importance of social capital on small business management another dimension, that is the financial effect of social capital.

This study has practical implications. The evidence that formal finance is strongly associated with firm investments suggests that policymakers in less developed countries need to liberalize their biased financial systems. Financing constraints are key obstacles to firm growth. As such, some scholars have called for facilitating the informal financial sector to mitigate the adverse effects of financing constraints. We suggest that informal finance can serve as a cushion for firms rationed out by the formal sector. However, it has little contribution to firm investments and growth subsequently. Therefore, building strong, well-regulated and unbiased formal financial systems should be the ultimate goal of policymakers in less developed countries (Saez, 2001).

Our findings also point to the importance of networking in gaining access to external loans. Entrepreneurs with stronger and wider social networks may find it easier to obtain informal debts. However, as we discussed, informal finance contributes insignificantly to investments. As such, entrepreneurs need to be aware of the costs (e.g., time, attention) and the benefits of their networking strategies. Overbuilt social networks may not result in sufficient capital for investments but turn out to be unproductive and inefficient (in terms of making and maintaining social ties).

This study is not without limitations that should be acknowledged, but they also provide potential avenues for future research. First, the generalizability of this study may be limited because the sample was restricted to Vietnamese small businesses that are exposed to Vietnamese management styles and local governance/institution structures. Future studies, therefore, should extend the proposed theoretical framework and re-test it in other contexts. Second, the dataset employed in this study is quite small (more than 3,700 firms) in a short period of time (11 years, six surveys). Future research should thus re-test the validity of our findings using a larger dataset with longer survey periods. Finally, due to the limited information available in the SME survey, we are mostly restricted to the use of dummy financing variables in this study. Future study may design questionnaires that capture count values of financing sources, which would allow a deeper understanding of the impact of financing strategies on firm investment.

## DATA AVAILABILITY STATEMENT

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## ENDNOTES
[1] Market failures include moral hazard and adverse selection, which is caused by agency costs. Moral hazard arises when actions taken by entrepreneurs are unobservable by outside investors but bring about benefits to entrepreneurs at the cost of investors. Adverse selection arises when entrepreneurs have more information than investors, making it difficult for investors to distinguish 'good' projects from 'bad' projects (Hechavarria, Matthews, & Reynolds, 2016).

[2] Carreira and Silva (2010) define financing constraints as the inability of a firm to raise the necessary capital to finance its optimal path of growth.

[3] Guanxi is a social tie in which relative trust is high and is not dependent on third parties (Burt & Burzynska, 2017). Guanxi serves as a mechanism by which quasi-familial relations can be created to cultivate trust among non-kin (Guo & Miller, 2010). This type of social tie is specific to China and other countries in the Southeast Asian region (Bian, 2017; Luo, Huang, & Wang, 2012).

[4] Including firms whose employees are smaller than zero and fixed assets are greater than total assets.

[5] Regular contact is defined as 'a contact of least once every 3 months, which you find useful for your business operations'.

[6] If the outcome can be fully explained by the treatment and full control sets, then $R_{\max} = 1$. However, in many empirical settings, due to measurement errors for example, the outcome cannot be fully explained even if the full control set is included.

[7] The factor 1.3 is suggested by (Oster, 2019). This value is obtained from an analysis of a randomized dataset of 65 articles. This value

was selected because it allows 90% of the results published in previous studies (lab or field experiments) to survive the omitted-variable tests.

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# APPENDIX A.

**TABLE A1** Correlation matrix

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Investment (1) | | | | | | | | | | | | | | |
| Financing sources (2) | 0.35 | | | | | | | | | | | | | |
| Social networks (3) | 0.06 | 0.10 | | | | | | | | | | | | |
| Owner gender (4) | 0.01$^{\#}$ | 0.00$^{\#}$ | −0.04 | | | | | | | | | | | |
| Owner age (5) | −0.11 | −0.11 | −0.04 | 0.15 | | | | | | | | | | |
| Start-up experience (6) | 0.05 | 0.04 | 0.02 | 0.05 | 0.04 | | | | | | | | | |
| Owner education (7) | 0.07 | 0.07 | 0.16 | −0.05 | −0.08 | 0.00$^{\#}$ | | | | | | | | |
| Firm age (8) | −0.13 | −0.12 | −0.04 | 0.03 | 0.32 | −0.04 | −0.09 | | | | | | | |
| Firm size (9) | 0.10 | 0.18 | 0.16 | −0.03 | −0.04 | 0.01$^{\#}$ | 0.20 | −0.06 | | | | | | |
| Export (10) | 0.07 | 0.12 | 0.07 | −0.04 | −0.05 | 0.02 | 0.19 | −0.07 | 0.35 | | | | | |
| Innovation (11) | 0.11 | 0.14 | 0.05 | 0.07 | −0.09 | 0.04 | −0.03 | −0.12 | 0.12 | 0.11 | | | | |
| Association (12) | 0.12 | 0.03 | −0.03 | 0.03 | −0.01$^{\#}$ | 0.06 | −0.12 | −0.07 | 0.09 | 0.06 | 0.24 | | | |
| Liability (13) | 0.36 | 0.51 | 0.07 | 0.00$^{\#}$ | −0.11 | 0.07 | 0.02 | −0.16 | 0.17 | 0.12 | 0.18 | 0.12 | | |
| Provincial consumption (14) | −0.10$^{\#}$ | −0.13 | 0.12 | −0.09 | −0.04 | −0.05 | 0.39 | 0.00 | 0.05 | 0.11 | −0.16 | −0.30 | −0.19 | |

*Note:* The statistics are provided for 15,851 firm-year observations from 2005 to 2015. The data source is the SME dataset published by the Central Institute for Economic Management (CIEM) of Vietnam. Coefficients with $^{\#}$ are not significant at 1%.

**TABLE A2** Household business and registered firms

| | (1) Household | (2) Household | (3) Household | (4) Household | (5) Registered | (6) Registered | (7) Registered | (8) Registered |
|---|---|---|---|---|---|---|---|---|
| Informal finance | 2.531*** (0.427) | | 2.529*** (0.427) | 2.889*** (0.566) | 4.922*** (1.095) | | 4.768*** (1.101) | 1.393 (1.475) |
| Formal finance | 14.003*** (1.176) | | 14.002*** (1.176) | 13.958*** (1.571) | 19.913*** (2.068) | | 19.925*** (2.072) | 20.040*** (2.911) |
| Both financing sources | 14.192*** (0.868) | | 14.187*** (0.867) | 11.624*** (1.328) | 18.059*** (1.476) | | 17.911*** (1.476) | 14.552*** (2.004) |
| Social networks | | 0.008 (0.009) | 0.001 (0.008) | −0.009 (0.009) | | 0.029** (0.014) | 0.027** (0.013) | −0.037 (0.028) |
| Informal finance × social networks | | | | −0.011 (0.013) | | | | 0.088*** (0.034) |
| Formal finance × social networks | | | | 0.002 (0.037) | | | | −0.001 (0.053) |
| Both financing sources × social networks | | | | 0.085** (0.036) | | | | 0.085** (0.039) |
| Owner gender | −0.419 (0.587) | −0.794 (0.617) | −0.421 (0.588) | −0.460 (0.589) | −0.407 (1.353) | −1.599 (1.421) | −0.359 (1.351) | −0.344 (1.356) |
| Owner age | −0.048 (0.043) | −0.047 (0.045) | −0.048 (0.043) | −0.051 (0.043) | −0.010 (0.076) | −0.011 (0.078) | −0.013 (0.075) | −0.020 (0.076) |
| Start-up experience | 1.275 (1.836) | 2.455 (1.808) | 1.280 (1.837) | 1.134 (1.863) | 0.515 (2.265) | 0.019 (2.411) | 0.365 (2.276) | 0.372 (2.294) |
| Owner education | −0.164 (0.206) | −0.058 (0.217) | −0.163 (0.207) | −0.153 (0.207) | 0.012 (0.341) | −0.188 (0.358) | −0.012 (0.339) | 0.056 (0.337) |
| Firm age | 1.407*** (0.153) | 1.069*** (0.157) | 1.408*** (0.153) | 1.418*** (0.154) | 1.053* (0.441) | 1.169*** (0.457) | 1.051** (0.440) | 1.007** (0.443) |
| Firm size | 0.836 (0.622) | 0.879 (0.655) | 0.835 (0.623) | 0.894 (0.622) | −1.628* (0.874) | −1.709* (0.908) | −1.594* (0.877) | −1.533* (0.879) |
| Export | −2.506 (1.845) | −2.832 (1.842) | −2.511 (1.846) | −2.712 (1.870) | −0.726 (2.277) | −0.255 (2.345) | −0.726 (2.279) | −0.691 (2.278) |
| Innovation | −0.377 (0.495) | −0.552 (0.530) | −0.375 (0.496) | −0.318 (0.497) | −0.413 (0.995) | −0.316 (1.033) | −0.477 (0.992) | −0.615 (1.003) |
| Association | 1.873 (1.356) | 3.366** (1.381) | 1.869 (1.356) | 1.824 (1.354) | 5.112*** (1.676) | 5.764*** (1.749) | 4.943*** (1.673) | 4.771*** (1.671) |
| Liability | −4.937* (2.709) | −5.515* (2.874) | −4.938* (2.710) | −4.835* (2.689) | −7.606** (3.229) | −9.086*** (3.367) | −7.760** (3.236) | −8.024** (3.214) |
| Province consumption | −0.139*** (0.026) | −0.141*** (0.028) | −0.140*** (0.027) | −0.138*** (0.027) | −0.076 (0.072) | −0.149** (0.075) | −0.078 (0.072) | −0.065 (0.072) |
| Observations | 6,432 | 6,446 | 6,432 | 6,432 | 3,008 | 3,010 | 3,008 | 3,008 |
| Number of firms | 0.476 | 0.414 | 0.476 | 0.478 | 0.468 | 0.418 | 0.469 | 0.472 |
| VIF | 4.215 | 4.250 | 4.521 | 5.364 | 4.221 | 4.215 | 4.366 | 5.527 |
| $R^2$ | .461 | .414 | .463 | .478 | .468 | .418 | .469 | .472 |

(Continues)

**TABLE A2** (Continued)

|  | (1) Household | (2) Household | (3) Household | (4) Household | (5) Registered | (6) Registered | (7) Registered | (8) Registered |
|---|---|---|---|---|---|---|---|---|
| Adjusted $R^2$ | 0.271 | 0.186 | 0.271 | 0.273 | 0.227 | 0.155 | 0.228 | 0.231 |
| Wald test informal finance = formal finance | 96.18 | | 96.2 | 48.83 | 53.39 | | 54.21 | 41.8 |
| p value | 0 | | 0 | 0 | 0 | | 0 | 0 |
| Wald test formal finance = both financing sources | 0.02 | | 0.02 | 1.47 | 0.88 | | 1.03 | 3.53 |
| p value | .881 | | .884 | .226 | .349 | | .311 | .06 |

*Note:* The dependent variable is firm investment. Columns 1–4 are for household businesses. Columns 5–8 are for registered firms. Firms using no external finance serve as the benchmark financing source. All estimations include full sets of two-digit industry dummies, 10 provincial dummies and 6-year dummies. *SE* and test statistics are asymptotically robust to heteroscedasticity. Variables firm size, export, innovation, association, liability, financing sources and social networks are lagged one period. VIF is variance inflation factor test for multicollinearity. Wald test informal finance = formal finance under the null that the coefficient associated with informal finance variable is equal to the coefficient associated with formal finance variable. Wald test formal finance = both financing sources under the null that the coefficient associated with formal finance variable is equal to the coefficient associated with both financing source. *indicates significant at 10%, **indicates significant at 5%, and ***indicates significant at 1%.

**TABLE A3** Four types of social networks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Informal finance | 2.877*** | 2.755*** | 2.831*** | 2.550*** | 2.554*** | 2.337*** | 2.852*** | 2.250*** |
| | (0.414) | (0.418) | (0.414) | (0.530) | (0.425) | (0.437) | (0.416) | (0.483) |
| Formal finance | 15.497*** | 14.872*** | 15.570*** | 15.788*** | 15.056*** | 14.645*** | 15.519*** | 14.610*** |
| | (1.015) | (1.212) | (1.015) | (1.240) | (1.030) | (1.400) | (1.023) | (1.240) |
| Both financing sources | 14.988*** | 15.178*** | 14.954*** | 12.957*** | 14.327*** | 14.823*** | 14.936*** | 14.444*** |
| | (0.738) | (0.756) | (0.737) | (0.926) | (0.773) | (0.783) | (0.740) | (0.872) |
| Same business-specific networks | −0.029 | −0.017** | | | | | | |
| | (0.021) | (0.009) | | | | | | |
| Informal finance × same business-specific networks | | 0.017* | | | | | | |
| | | (0.009) | | | | | | |
| Formal finance × same business-specific networks | | 0.100 | | | | | | |
| | | (0.105) | | | | | | |
| Both financing sources × same business-specific networks | | −0.015 | | | | | | |
| | | (0.021) | | | | | | |
| Different business-specific networks | | | 0.025** | −0.005 | | | | |
| | | | (0.011) | (0.016) | | | | |
| Informal finance × different business-specific networks | | | | 0.017 | | | | |
| | | | | (0.022) | | | | |
| Formal finance × different business-specific networks | | | | −0.012 | | | | |
| | | | | (0.043) | | | | |
| Both financing sources × different business-specific networks | | | | 0.101*** | | | | |
| | | | | (0.033) | | | | |
| Financing-specific networks | | | | | 0.432*** | −0.415 | | |
| | | | | | (0.146) | (0.307) | | |
| Informal finance × financing-specific networks | | | | | | 0.751** | | |
| | | | | | | (0.331) | | |
| Formal finance × financing-specific networks | | | | | | 0.858 | | |
| | | | | | | (0.667) | | |
| Both financing sources × financing-specific networks | | | | | | 0.443 | | |
| | | | | | | (0.321) | | |
| Political-specific networks | | | | | | | 0.078 | −0.252 |
| | | | | | | | (0.113) | (0.163) |
| Informal finance × political-specific networks | | | | | | | | 0.469** |
| | | | | | | | | (0.220) |
| Formal finance × political-specific networks | | | | | | | | 0.635 |
| | | | | | | | | (0.502) |
| Both financing sources × political-specific networks | | | | | | | | 0.381 |
| | | | | | | | | (0.278) |
| Owner gender | −0.379 | −0.431 | −0.376 | −0.385 | −0.420 | −0.452 | −0.421 | −0.390 |
| | (0.598) | (0.595) | (0.597) | (0.595) | (0.600) | (0.602) | (0.599) | (0.600) |

(Continues)

**TABLE A3** (Continued)

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Owner age | −0.033 | −0.034 | −0.035 | −0.036 | −0.037 | −0.037 | −0.037 | −0.039 |
|  | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| Start-up experience | 1.189 | 1.183 | 1.131 | 1.035 | 1.173 | 1.189 | 1.208 | 1.209 |
|  | (1.451) | (1.454) | (1.456) | (1.461) | (1.462) | (1.465) | (1.452) | (1.462) |
| Owner education | −0.166 | −0.169 | −0.164 | −0.155 | −0.167 | −0.173 | −0.177 | −0.179 |
|  | (0.184) | (0.185) | (0.184) | (0.184) | (0.188) | (0.188) | (0.185) | (0.185) |
| Firm age | 1.301*** | 1.315*** | 1.309*** | 1.313*** | 1.303*** | 1.312*** | 1.323*** | 1.317*** |
|  | (0.150) | (0.149) | (0.150) | (0.150) | (0.151) | (0.151) | (0.151) | (0.151) |
| Firm size | −0.697 | −0.741 | −0.682 | −0.636 | −0.702 | −0.680 | −0.713 | −0.699 |
|  | (0.554) | (0.555) | (0.555) | (0.554) | (0.560) | (0.560) | (0.558) | (0.558) |
| Export | −1.820 | −1.819 | −1.832 | −1.918 | −1.900 | −1.999 | −1.864 | −1.935 |
|  | (1.721) | (1.722) | (1.721) | (1.722) | (1.733) | (1.735) | (1.736) | (1.739) |
| Innovation | −0.391 | −0.396 | −0.408 | −0.426 | −0.378 | −0.388 | −0.374 | −0.384 |
|  | (0.459) | (0.459) | (0.459) | (0.459) | (0.467) | (0.468) | (0.462) | (0.462) |
| Association | 3.855*** | 3.895*** | 3.793*** | 3.665*** | 3.788*** | 3.871*** | 3.763*** | 3.758*** |
|  | (1.097) | (1.100) | (1.096) | (1.095) | (1.103) | (1.101) | (1.107) | (1.106) |
| Collateral | −6.473*** | −6.445*** | −6.554*** | −6.545*** | −6.624*** | −6.642*** | −6.442*** | −6.491*** |
|  | (2.070) | (2.062) | (2.067) | (2.061) | (2.079) | (2.084) | (2.085) | (2.087) |
| Province consumption | −0.125*** | −0.129*** | −0.129*** | −0.127*** | −0.128*** | −0.127*** | −0.129*** | −0.126*** |
|  | (0.028) | (0.028) | (0.028) | (0.028) | (0.028) | (0.028) | (0.028) | (0.028) |
| Observations | 15,851 | 15,851 | 15,851 | 15,851 | 15,851 | 15,851 | 15,851 | 15,851 |
| Number of firms | 3,715 | 3,715 | 3,715 | 3,715 | 3,715 | 3,715 | 3,715 | 3,715 |
| VIF | 4.383 | 4.092 | 4.396 | 4.984 | 4.365 | 4.212 | 4.964 | 4.224 |
| $R^2$ | .479 | .480 | .479 | .481 | .480 | .480 | .479 | .479 |
| Adjusted $R^2$ | 0.272 | 0.274 | 0.274 | 0.274 | 0.273 | 0.273 | 0.273 | 0.272 |

*Note:* The dependent variable is firm investment. Firms using no external finance serve as the benchmark financing source. All estimations include full sets of two-digit industry dummies, 10 provincial dummies and 6-year dummies. *SE* and test statistics are asymptotically robust to heteroscedasticity. Variables firm size, export, innovation, association, liability, financing sources and social networks are lagged one period. VIF is variance inflation factor test for multicollinearity. Wald test informal finance = formal finance under the null that the coefficient associated with informal finance variable is equal to the coefficient associated with formal finance variable. Wald test formal finance = both financing sources under the null that the coefficient associated with formal finance variable is equal to the coefficient associated with both financing source. *indicates significant at 10%, **indicates significant at 5%, and ***indicates significant at 1%.

**TABLE A4** Biased-adjusted results

| Treatment effect | Baseline effect ($R^2$) | Controlled effect ($R^2$) | Bias-adjusted beta $R_{max} = \tilde{R} + (\tilde{R} - \dot{R})$ | Bias-adjusted beta $R_{max} = 1.3\tilde{R}$ | Delta for beta = 0, given $R_{max} = 1.3\tilde{R}$ |
|---|---|---|---|---|---|
| Networking (total sample) | 0.016 (.069) | 0.013 (.131) | 0.009 | 0.010 | 2.994 |
| Networking (household business sample) | 0.006 (.066) | 0.001 (.141) | −0.003 | −0.002 | 0.286 |
| Networking (registered firm sample) | 0.028 (.078) | 0.027 (.127) | 0.024 | 0.025 | 9.027 |

*Note:* This table shows the bias-adjusted treatment effects for owner gender and female employee rate. Column (1) shows the regression coefficients without controls (baseline effect). Column (2) shows the regression coefficients with observable controls (controlled effect). Column (3) presents the bias-adjusted treatment effect with assumptions that $\delta = 1$, and $R_{max} = \tilde{R} + (\tilde{R} - \dot{R})$, in which $\tilde{R}$ is R-squared obtained from the controlled specification and $\dot{R}$ is the R-squared obtained from the baseline specification. Column (4) presents the bias-adjusted treatment effect with assumptions $\delta = 1$, and $R_{max} = 1.3\tilde{R}$. Column (5) presents the value of $\delta$ for which the treatment effect becomes zero under the assumption that $R_{max} = 1.3\tilde{R}$. The values in (.) are the R-squared.

**TABLE A5** GMM results

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Lagged investment | −19.740*** (6.718) | 11.227 (17.892) | −9.180 (7.169) | 2.867 (1.953) | 11.829 (13.290) |
| Informal finance | 2.376*** (0.443) | 2.633*** (0.425) | 3.006*** (0.324) | 3.036*** (0.461) | 3.628 (9.029) |
| Formal finance | 15.621*** (1.147) | 14.830*** (1.177) | 15.897*** (1.067) | 15.174*** (1.546) | 23.207* (12.707) |
| Both financing sources | 13.725*** (0.885) | 15.538*** (0.835) | 15.202*** (0.708) | 15.183*** (0.828) | 12.180 (8.016) |
| Social networks | −0.009 (0.007) | | | | |
| Informal finance × social networks | 0.020* (0.011) | | | | |
| Formal finance × social networks | −0.007 (0.022) | | | | |
| Both financing sources × social networks | 0.054*** (0.019) | | | | |
| Same business-specific networks | | −0.013 (0.010) | | | |
| Informal finance × same business-specific networks | | 0.014 (0.010) | | | |
| Formal finance × same business-specific networks | | 0.079 (0.097) | | | |
| Both financing sources × same business-specific networks | | 0.001 (0.013) | | | |
| Different business-specific networks | | | 0.004 (0.007) | | |
| Informal finance × different business-specific networks | | | −0.005 (0.007) | | |
| Formal finance × different business-specific networks | | | −0.025 (0.031) | | |
| Both financing sources × different business-specific networks | | | 0.023 (0.018) | | |
| Financing-specific networks | | | | 0.085** (0.038) | |
| Informal finance × financing-specific networks | | | | 0.263* (0.140) | |
| Formal finance × financing-specific networks | | | | 0.713 (0.677) | |
| Both financing sources × financing-specific networks | | | | −0.022 (0.125) | |
| Political-specific networks | | | | | −5.096* (2.750) |
| Informal finance × political-specific networks | | | | | 6.061* (3.198) |
| Formal finance × political-specific networks | | | | | 0.564 (6.092) |
| Both financing sources × political-specific networks | | | | | 6.878** (3.311) |
| Owner gender | 0.565 (0.392) | 0.179 (0.445) | 0.493 (0.390) | 0.352 (0.390) | −0.208 (0.702) |
| Owner age | −0.089*** (0.021) | −0.062*** (0.024) | −0.083*** (0.021) | −0.078*** (0.021) | −0.064* (0.033) |
| Start-up experience | 0.829 (1.232) | 0.406 (1.335) | 0.705 (1.215) | 0.534 (1.232) | −0.546 (1.739) |
| Owner education | −0.204 (0.135) | −0.164 (0.195) | −0.173 (0.136) | −0.076 (0.135) | −0.026 (0.220) |
| Firm age | −0.049*** (0.017) | −0.006 (0.029) | −0.039** (0.017) | −0.033** (0.014) | −0.028 (0.046) |

(Continues)

**TABLE A5**  (Continued)

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Firm size | 2.371*** (0.753) | 0.254 (2.826) | 1.948** (0.775) | 0.130 (0.308) | 0.227 (3.268) |
| Export | 0.519 (2.423) | 6.573 (5.831) | 0.451 (2.152) | −1.348 (1.165) | −0.467 (6.068) |
| Innovation | −0.312 (0.610) | 1.834 (4.226) | −0.180 (0.587) | −0.353 (0.411) | −0.464 (4.110) |
| Association | 1.555* (0.917) | 1.999* (1.143) | 1.783* (0.928) | 2.489*** (0.886) | 1.531 (1.539) |
| Collateral | 8.140* (4.357) | 4.152 (13.332) | 1.329 (4.459) | −5.357*** (1.961) | 13.009 (14.370) |
| Province consumption | −0.098*** (0.031) | −0.119*** (0.029) | −0.120*** (0.024) | −0.135*** (0.024) | −0.075 (0.145) |
| Observations | 15,851 | 15,851 | 15,851 | 15,851 | 15,851 |
| Number of firms | 3,715 | 3,715 | 3,715 | 3,715 | 3,715 |
| VIF | 4.346 | 4.345 | 4.657 | 4.335 | 4.753 |
| Hansen J | 0.015 | 0.259 | 0.021 | 0.064 | 0.824 |
| AR(2) | 0.104 | 0.313 | 0.604 | 0.379 | 0.202 |

*Note:* The dependent variable is firm investment. Firms using no external finance serve as the benchmark financing source. All estimations include full sets of two-digit industry dummies, 10 provincial dummies and 6-year dummies. *SE* and test statistics are asymptotically robust to heteroscedasticity. Endogenous variables are firm size, export, innovation, association, liability, financing sources and social networks. These variables are instrumented by the lagged values. The instruments for the difference equation are the lagged 3- to 5-year level-variables. The instruments for level equation are the lagged 2- to 4-year difference-variables. VIF is variance inflation factor test for multicollinearity. Hansen (J) is over-identification test, under the null that the overidentifying restrictions are valid, the statistic is asymptotically distributed as a chi-square variable. AR(2) is autocorrelation test under the null that there is no autocorrelation in the transformed equations. *indicates significant at 10%, **indicates significant at 5%, and ***indicates significant at 1%.